

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 1

SUMMARY TABLES FOR NERC AND REGIONAL ENTITY

PROPOSED 2018 BUDGETS AND ASSESSMENTS

NERC'S Proposed Budget by Program¹

NERC Program	2017 Budget for Statutory Functions	2018 Budget for Statutory Functions
Reliability Standards	\$ 8,100,282	\$ 6,821,893
<u>Compliance Monitoring and Enforcement</u>		
Compliance Assurance	7,858,599	8,904,105
Compliance Analysis, Organization Registration and Certification	3,646,289	4,887,082
Compliance Enforcement	5,800,647	6,673,939
Reliability Assessment and System Analysis	7,535,594	7,312,956
<u>Reliability Risk Management</u>		
Situation Awareness	4,032,862	3,846,648
Event Analysis	5,446,206	5,161,490
Performance Analysis	4,908,855	4,633,422
E-ISAC (including CRISP)	18,515,341	21,850,597
Training, Education and Personnel Certification	3,757,501	3,043,024
Total Budget	\$ 69,602,175	\$ 73,135,156

¹Does not include the proposed provision for Working Capital reserve funding

Proposed Budget for Statutory Activities of NERC, Each Regional Entity and WIRAB¹

	2017 Budget for Statutory Functions	2018 Budget for Statutory Functions
NERC	\$ 69,602,175	\$ 73,135,156
FRCC	7,177,854	7,514,112
MRO	11,226,668	11,726,736
NPCC	15,147,054	15,106,967
ReliabilityFirst	19,908,939	21,393,899
SERC	17,482,403	17,182,868
SPP RE	10,865,511	10,793,195
Texas RE	12,167,256	12,656,953
WECC	26,796,928	27,097,344
WIRAB	1,229,080	1,067,785
Total Budget	\$ 191,603,868	\$ 197,675,015

¹Does not include the proposed provision for Working Capital reserve funding

Proposed Assessments for Statutory Activities of NERC and Each Regional Entity and WIRAB

	Assessments for Statutory Functions 2017	Allocation to Canada 2017	Assessments for Statutory Functions 2018	Allocation to Canada 2018	Allocation to Canada 2018 Budget v 2017 Budget Over (Under)	% Over (Under)
NERC	\$ 59,856,314	\$ 5,353,026	\$ 62,936,968	\$ 5,778,945	\$ 425,919	7.96%
Regional Entities	\$ 110,150,014	\$ 10,003,039	\$ 115,366,505	\$ 10,385,989	\$ 382,950	3.83%
FRCC	6,163,896	-	6,660,518	-		
MRO	10,494,345	1,777,059	10,730,106	1,789,219		
NPCC	14,255,060	5,360,364	14,341,787	5,592,327		
ReliabilityFirst	19,560,881	-	20,147,707	-		
SERC	15,706,023	-	17,205,136	-		
SPP RE	9,092,553	-	9,727,265	-		
Texas RE	9,595,256	-	11,271,986	-		
WECC	25,282,000	2,865,616	25,282,000	3,004,443		
WIRAB	\$ 901,452	\$ 128,716	\$ 711,026	\$ 101,234	\$ (27,482)	-21.35%
Total Budget	\$ 170,907,780	\$ 15,484,781	\$ 179,014,499	\$ 16,266,168	\$ 781,387	5.05%

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 2

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

PROPOSED 2018 BUSINESS PLAN AND BUDGET

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2018 Business Plan and Budget

Final

August 10, 2017

RELIABILITY | ACCOUNTABILITY



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About NERC

Overview

The North American Electric Reliability Corporation (NERC) is a not-for-profit entity organized under the New Jersey Nonprofit Corporation Act. NERC's mission is to improve and ensure the reliability of the Bulk Power System (BPS)¹ in North America. NERC's area of responsibility spans the continental U.S. and portions of Canada and Mexico. Entities under NERC's jurisdiction are the users, owners, and operators of the BPS—a system that serves the needs of over 340 million people, includes installed electricity production capacity of approximately 1,200 gigawatts, operates 475,000 miles of high-voltage transmission (100 kV and above), and is comprised of assets worth more than one trillion dollars.

Electric Reliability Organization (ERO)

The Federal Energy Regulatory Commission (FERC or Commission) certifies and has oversight of NERC as the electric reliability organization (ERO) within the U.S. to establish and enforce reliability standards for the U.S. portion of the BPS, pursuant to Section 215 of the Federal Power Act (§215). As of June 18, 2007, FERC granted NERC the legal authority to enforce reliability standards with all U.S. users, owners, and operators of the BPS and made compliance with those standards mandatory and enforceable. Equivalent relationships have been sought and, for the most part, realized in Canada and Mexico.

International Relations

Prior to adoption of §215 in the U.S., the Canadian provinces of Ontario (in 2002) and New Brunswick (in 2004) adopted all NERC reliability standards that were approved by the NERC Board of Trustees (Board) as mandatory and enforceable within their respective jurisdictions through market rules. Reliability legislation is in place, or NERC has memoranda of understanding with, provincial authorities in Ontario, New Brunswick, Nova Scotia, Québec, Manitoba, Saskatchewan, British Columbia, and Alberta, and with the National Energy Board of Canada (NEB). NERC's standards are mandatory and enforceable in Ontario and New Brunswick as a matter of provincial law. Manitoba has adopted legislation, and standards are also mandatory. In addition, NERC has been designated as the "electric reliability organization" under Alberta's Transmission Regulation, and certain reliability standards have been approved in that jurisdiction; others are pending. NERC reliability standards are now mandatory in British Columbia and Nova Scotia. NERC and the Northeast Power Coordinating Council (NPCC) have been recognized as standards-setting bodies by the Régie de l'énergie de Québec, and Québec has the framework in place for reliability standards to become mandatory. NEB has made reliability standards mandatory for international power lines between the U.S. and Canada.

In Mexico, the Comisión Federal de Electricidad has signed the Western Electricity Coordinating Council's (WECC's) reliability management system agreement, which applies only to Baja California Norte. On March 8, 2017, NERC, the Comisión Reguladora de Energía (CRE), and the Centro Nacional de Control de Energía (CENACE) signed a memorandum of understanding (MOU), which outlines a framework for a cooperative relationship between NERC and Mexico to further enhance reliability of the North American bulk power system. The MOU recognizes the established and growing interconnections between the U.S. and Mexico and roles of each party in support of continued reliability. The agreement establishes a collaborative mechanism for identification, assessment, and prevention of reliability risks to strengthen grid security, resiliency, and reliability. As outlined in the memorandum, executives from NERC, CRE, and CENACE have formed a steering group to establish priorities and objectives for the technical support and collaboration envisioned in the MOU. The steering group will also address governance matters, resource requirements, and funding mechanisms. Technical working groups comprised of staff from the three

¹ NERC's standards, compliance, and enforcement activities are focused on the [Bulk Electric System \(BES\)](#), which is comprised of certain BPS facilities.

organizations will be formed as needed to implement the collaboration. The first meeting of the steering group occurred in May 2017 and the technical working groups are currently meeting and forming operating plans. Discussions are ongoing with Mexico's financial representatives to address the potential of including an updated assessment in 2018.

Membership and Governance

An 11-member Board, comprised of 10 independent trustees and NERC's president and chief executive officer (CEO) serving as the management trustee, governs NERC. The Board has formed several committees to facilitate oversight of the organization in the areas of finance and audit, governance and human resources, compliance, standards oversight and technology, nominations and, most recently, enterprise-wide risk.

Membership in NERC is open to any person or entity that has an interest in the reliability of the North American Bulk Electric System (BES). Membership is voluntary and affords participants the opportunity to engage in the governance of the organization through election to the Member Representatives Committee (MRC).² More than 600 entities and individuals are members of NERC.

Scope of Oversight

As the international, multijurisdictional ERO in North America, NERC is authorized to:

- Propose, support the development of, monitor compliance with, and enforce mandatory reliability and security standards for the North American BES, subject to regulatory oversight and approvals from FERC in the U.S. and applicable authorities in Canada;
- Conduct near-term and long-term reliability assessments of the North American BPS;
- Certify BPS operators as having and maintaining the necessary knowledge and skills to perform their reliability responsibilities;
- Maintain situational awareness of events and conditions that may threaten BPS reliability;
- Coordinate efforts to improve physical and cyber security for the BPS of North America;
- Conduct detailed analyses and investigations of system disturbances and unusual events as well as measure ongoing system trends to determine root causes, uncover lessons learned, and issue relevant findings as advisories, recommendations, guidelines, and essential actions to the industry to mitigate and control risks to reliability; and
- Identify and prioritize risks to reliability and use a broad toolkit to mitigate and control risks to reliability, including the potential need for new or modified reliability and security standards, improved compliance monitoring and enforcement methods, or other initiatives.

Delegated Authorities

In executing its responsibility, NERC delegates certain authorities to eight regional reliability entities (Regional Entities or the Regions) to perform aspects of the ERO functions described through delegation agreements. FERC has approved delegation agreements between NERC and the eight Regional Entities (Florida Reliability Coordinating Council (FRCC), Midwest Reliability Organization (MRO), Northeast Power Coordinating Council, Inc. (NPCC), ReliabilityFirst (RF), SERC Reliability Corporation (SERC), Southwest Power Pool Regional Entity (SPP RE), Texas Reliability Entity, Inc. (Texas RE), and the Western Electricity

² The [Member Representatives Committee](#) (MRC) comprises voting representatives elected from the 12 membership sectors. The MRC elects the independent trustees and, along with the Board, votes on amendments to the Bylaws. The MRC also provides policy advice and recommendations to the Board on behalf of stakeholders with respect to annual budgets, business plans, and other matters pertinent to the purpose and operation of the organization.

Coordinating Council (WECC)). These agreements describe the authorities delegated and responsibilities assigned to the Regional Entities in the U.S. to address, among other things: (1) developing regional reliability standards, (2) monitoring compliance with and enforcement of mandatory reliability standards (both North American-wide and regional), (3) certifying registered entities and registering owners, operators, and users of the BES, (4) assessing reliability and analyzing performance, (5) training and education, (6) event analysis and reliability improvement, and (7) situation awareness and infrastructure security. NERC expects Regional Entities whose territories and geographic footprints extend into Canadian provinces and Mexico to perform equivalent functions in those jurisdictions.

ERO Enterprise Operating Model

The collective network of leadership, experience, judgment, skills, and technologies shared among NERC and the eight Regional Entities is referred to as the ERO Enterprise (the Enterprise). In 2014, a common operating model, *Improving Coordinated Operations across the ERO Enterprise*,³ was developed to define how NERC and the Regional Entities achieve excellence in the oversight and execution of statutory functions by collaborating to mitigate reliability risks. The model also defines the division of the roles and responsibilities for NERC and the Regional Entities to efficiently and effectively execute services performed as the collective Enterprise. In 2015, implementation of this model progressed with oversight plans developed for Compliance Monitoring and Enforcement programs, as well as Registration, continuing into 2016 with Performance Analysis, Situational Awareness, and Events Analysis. Further, NERC and the Regional Entities deepened their coordination activities to identify, prioritize, and address risks to reliability.

NERC has unique responsibilities within the ERO Enterprise to design the oversight of program areas, develop operational oversight and leadership, set qualifications and expectations for the performance of delegated activities, and assess, train, and give feedback to corresponding regional programs. NERC also reviews and provides input to the annual Regional Entity business plans and budgets, including but not limited to review of resource allocations, staffing capacity assessments, and program performance assessments. NERC input and review occurs before regional board approval.

Similarly, the Regional Entities have a mirrored set of responsibilities that include being responsive to the design of the operational model, providing input into the overall development of each ERO program area, providing training and development to meet ERO qualifications, being receptive to feedback from the ERO, and making responsive adjustments. Regional Entities also have an obligation to meet professional standards of independence and objectivity and provide the best available expertise for addressing risks.

With due recognition and awareness of the distinction between individual roles, responsibilities, and corporate status, NERC and the Regional Entities are continually refining their individual and collective operating and governance practices in support of an agreed-upon set of strategic goals and objectives that are designed to ensure the ERO fulfills its statutory obligations.

Statutory and Regulatory Background

NERC's authority as the ERO in the U.S. is based on Section 215 of the Federal Power Act, as added by the Energy Policy Act of 2005,⁴ and the Commission's regulations and orders issued pursuant to Section 215. In Canada, NERC's authorities are established by the memoranda of understanding and regulations previously mentioned.

³ [Improving Coordinated Operations Across the ERO Enterprise](#)

⁴ This was codified in section 215 of the Federal Power Act, 16 United States C. 824o.

Funding

Section 215 of the Federal Power Act and the Commission's regulations specify procedures for NERC's funding in the U.S. NERC's annual business plan and budget is subject to Commission approval in the U.S. Once approved, NERC's annual funding is provided through assessments to load-serving entities. These assessments are allocated on a Net-Energy-for-Load (NEL) basis. Equivalent funding mechanisms are provided in Canada, subject to the specific laws and regulations of each province.

The Regional Entities' funding requirements are addressed separately in their respective business plans and budgets, which must be reviewed and approved by NERC and FERC in the U.S. Assessments for the Regional Entity budgets are included in the overall NERC assessments to load-serving entities.

Introduction and Executive Summary

TOTAL RESOURCES (in whole dollars)				
	2018 Budget	U.S.	Canada	Mexico
Statutory FTEs	199.28			
Non-statutory FTEs	-			
Total FTEs	199.28			
Statutory Expenses	\$ 70,855,455			
Non-Statutory Expenses	\$ -			
Total Expenses	\$ 70,855,455			
Statutory Inc (Dec) in Fixed Assets	\$ 2,279,701			
Non-Statutory Inc (Dec) in Fixed Assets	\$ -			
Total Inc (Dec) in Fixed Assets	\$ 2,279,701			
Statutory Funding of Reserves	\$ 77,458			
Non-Statutory Funding of Reserves	\$ -			
Total Working Capital Requirement	\$ 77,458			
Net Proceeds from Financing Activities	\$ (231,393)			
Total Statutory Funding Requirement	\$ 72,981,221			
Total Non-Statutory Funding Requirement	\$ -			
Total Funding Requirement	\$ 72,981,221			
	TOTAL	US	CANADA	MEXICO
Statutory Funding Assessments	\$ 62,936,968	\$ 56,968,506	\$ 5,778,945	\$ 189,517
Non-Statutory Fees	\$ -	\$ -	\$ -	\$ -
NEL	4,506,897,694	3,981,131,801	512,670,827	13,095,066
NEL%	100.00%	88.33%	11.38%	0.29%

Note: Mexico assessments included herein relate only to the activities in Baja California Norte. Discussions are ongoing with Mexican representatives on the possible addition of new assessments for 2018, but are not yet estimated in this table.

Strategic Goals and Metrics

The ERO Enterprise strategic plan and metrics⁵ is informed by ongoing ERO Enterprise activities to identify (1) BPS reliability risks, particularly the Reliability Issues Steering Committee's (RISC's) *ERO Reliability Risk Priorities Report*⁶ and (2) opportunities for ERO Enterprise effectiveness and efficiency. The transparent and collaborative process includes input from stakeholders, the NERC Board, and Regional Entity Boards. In 2016, these inputs were used by ERO Enterprise leadership to review and update (1) the strategic plan goals and contributing activities as necessary to inform ERO Enterprise operational coordination, resource planning and allocation, and budgeting on a three-year horizon and (2) the metrics to ensure they are meaningfully informing ERO Enterprise near and long-term priorities.

Since the central focus of the strategic plan is to drive NERC and Regional Entity operating activities, the NERC Board and ERO Enterprise leadership recommended that in 2017 the strategic plan be rebranded as the ERO Enterprise operating plan and that a separate initiative be undertaken to develop a longer term strategy for the ERO Enterprise to guide future updates to the ERO Enterprise operating plan. Drafts of the long-term strategy will be posted for two stakeholder comment periods, and the final document will be presented for review and approval at the Board meeting in November 2017. Draft updates to the RISC report and recommendations will also be reviewed at the November 2017 MRC meeting and a final report and updated recommendations submitted to the Board for acceptance in February 2018. While these updates will specifically inform the development of the NERC and Regional Entity 2019 BP&Bs, management will also be reviewing and taking into consideration any feedback that is received as part of the updates to the operating plan and RISC report and recommendations in connection with the finalization of the 2018 BP&B.

Evolving Reliability Risks

Over the past six years, NERC has transformed its activities towards being more risk-based, ensuring that the right activities are focused on the most pertinent risks to the reliable operation of the BPS. The RISC is an advisory committee to the Board, providing key insights, priorities, and high-level leadership for issues of strategic importance to BPS reliability. The 2016 RISC report presents the results of its continued work to define and prioritize risks and to offer recommendations to the Board to inform the development of NERC's risk strategy. The RISC report recommendations are considered as the strategic plan, goals, and supporting activities are updated for the coming years. In 2016, the RISC recommended a high level of focus and priority in the following areas:

Cybersecurity Vulnerabilities

Cyber threats are becoming more sophisticated and increasing in number. Exploitation of cybersecurity vulnerabilities can potentially result in loss of control or damage to BPS-related voice communications, data, monitoring, protection and control systems, or tools. A cyber-attack can lead to equipment damage, degradation of reliable operations, and loss of load. Further, cybersecurity vulnerabilities can come from several sources, both internal and external, and in some instances the utility may have its cybersecurity fully tested.

Changing Resource Mix

The rapid rate at which fuel costs, subsidies, and federal, state, and provincial policies are affecting the resource mix are creating a new paradigm in which planners, balancing authorities, and system operators are reacting to resource additions and retirements. Further, the integration of new technologies and distributed energy resources are affecting the availability of operators to see and control resources within their area.

⁵ [ERO Enterprise Strategic Plan and Metrics 2017-2020](#)

⁶ [ERO Reliability Risk Priorities Report](#)

BPS Planning

BPS planning is a risk closely tied to the changing resource mix because planners currently lack the ability to update or create system models and scenarios of potential future states to identify system needs based on the dynamic nature of the system. This changing system makes it increasingly difficult to evaluate BPS stability, including inertia and frequency response, voltage support (adequate dynamic and static reactive compensation), and ramping constraints.

Resource Adequacy

Changes in the generation resource mix and new technologies are altering the operational characteristics of the grid and will challenge system planners and operators to maintain reliability in real time. Failure to take into account these changing characteristics and capabilities can lead to insufficient capacity and essential reliability services to meet customer demands.

Strategic Goals

The ERO Enterprise has five strategic goals, adopted by the Board in November 2016, enabling the ERO Enterprise to successfully carry out its mission. A detailed description of each goal and activities that contribute to its success are provided below, followed by additional information about the allocation of NERC's resources toward achievement of each goal. The ERO Enterprise also has seven metrics that have been approved for 2017.⁷ Updated goals and activities that will be part of the operating plan, as well as updates to the metrics, will be finalized for approval by the Board in November 2017, with opportunities for stakeholder feedback prior to their approval. At this time, it is not anticipated that these updates will have a material impact on NERC's overall budget or resource allocation among operating areas for 2018. However, the updates may potentially affect priorities and workload within particular departments and will inform resource planning and allocation for the 2019 budget year.

Goal 1

Risk-Responsive Reliability Standards

Reliability Standards establish threshold requirements for assuring the BES is planned, operated, and maintained to minimize risks of cascading failures, avoid damage to major equipment, or limit interruptions of the BPS. Reliability Standards are clear, timely, effective in mitigating risks to reliability, and consider cost-effectiveness/impact.

Contributing Activities

- Develop, modify, and conduct periodic reviews of the Reliability Standards to assure they are clear and properly structured for existing and emerging risks.
- Develop and implement ERO Enterprise and stakeholder feedback loops to identify and address any gaps or ambiguities in Reliability Standards.
- Review the recommendations from the Essential Reliability Services Task Force to determine if the current body of NERC's planning Reliability Standards sufficiently addresses the need for essential reliability services.
- Evaluate options for assessing the cost effectiveness/impact of Reliability Standards.
- Address regulatory issues and orders (e.g., supply chain and critical infrastructure protection Reliability Standards) and technical analysis supporting geomagnetic disturbance requirements.
- Facilitate implementation of Reliability Standards by providing guidance or outreach for approved Reliability Standards.

⁷ See [ERO Enterprise Strategic Plan and Metrics 2017-2020](#) for details.

Goal 2

Objective and Risk-informed Compliance Monitoring, Enforcement, and Organization Certification and Registration

The ERO Enterprise is a strong enforcement authority that is objective, fair, and promotes a culture of reliability excellence through risk-informed compliance monitoring, enforcement, certification, and registration.

Contributing Activities

- Implement registration program improvements to ensure consistent technical basis for registration and deregistration of entities.
- Implement the certification program consistently across the ERO Enterprise.
- Develop and implement compliance oversight plans for registered entities focusing on relevant risks, including consideration of inherent risk assessments and internal control evaluations.
- Implement compliance monitoring and enforcement timely and transparently, using a consistent framework.
- Enhance and implement training for ERO Enterprise Compliance Monitoring and Enforcement Program (CMEP) staff.
- Provide guidance and outreach to registered entities, including the review of Implementation Guidance for endorsement.
- Reduce recidivism through rigorous assessment of registered entities' plans to mitigate noncompliance.
- Evaluate the existing compliance, reporting, and analysis tracking system and other compliance tools to support risk-based activities that meet the needs of the CMEP.

Goal 3

Identification and Mitigation of Significant Risks to Reliability

The ERO Enterprise identifies the most significant risks to reliability, provides assurance for mitigating reliability risks, and promotes a culture of reliability excellence. The ERO Enterprise supports the Electricity Information Sharing and Analysis Center (E-ISAC), the Cybersecurity Risk Information Sharing Program (CRISP), reliability assessments, performance analysis, event analysis, situational awareness, and physical security and cybersecurity preparedness.

Contributing Activities

- Develop guidelines and industry practices to maintain accurate system models that include the resources (synchronous and inverter based), load, and controllable devices providing essential reliability services.
- Develop advanced and probabilistic methods to evaluate resource adequacy.
- Gather additional phasor measurement unit datasets to advance analytics and modeling improvements.
- Analyze system performance, events, and relationships among data sources to identify risks and mitigation strategies, and provide recommendations and lessons learned.
- Expand the use, availability, and value of physical security and cybersecurity threat and vulnerability information sharing, including cross sector communications, and analytics.

- In collaboration with the Critical Infrastructure Protection Committee and industry stakeholders, develop a risk process to address the potential impacts of cyber and physical security threats and vulnerabilities.
- Conduct assessments of system resiliency and develop guidance for operations in a more secure state.
- Engage industry, forums, and technical committees in identifying and mitigating risks, including reducing misoperations, AC substation equipment failures, vegetation-related outages, and improving cold weather preparedness and human performance.

Goal 4

Identification and Assessment of Emerging Risks to Reliability

The ERO Enterprise identifies, evaluates, studies, and independently assesses emerging risks to reliability.

Contributing Activities

- Enhance reliability assessments to reflect changing resource mix behavior, including distributed energy resources and essential reliability services, using probabilistic approaches that consider the variable and energy-limited nature of the evolving resource mix.
- Educate policy makers, regulators, and the industry of reliability effects and interconnection requirements for the changing resource mix.
- Develop sufficiency/adequacy guidelines for essential reliability services, including considerations of reliability attributes under a more diverse resource mix and changing load behavior, such as ramping, reserve services, and voltage support.
- Assess risks associated with cross sector dependencies and single points of disruptions.
- Develop, acquire, and maintain necessary tools for efficient data collection, management, and analytics across the ERO Enterprise.
- Evaluate the reliability impacts of distributed energy resources on planning, operations, and restoration and recovery, including the identification of data and information sharing needs.

Goal 5

Effective and Efficient ERO Enterprise Operations

The ERO Enterprise supports and encourages transparency, consistency, quality, efficiency, and timeliness of results and operates as a collaborative enterprise.

Contributing Activities

- Articulate a shared vision of reliability excellence and support and inspire stakeholders continent-wide in working to attain that vision.
- Acquire, engage, develop, and retain highly qualified talent with requisite technical expertise to execute the ERO Enterprise's statutory functions.
- Understand and manage ERO Enterprise internal risks.
- Enhance and implement documented oversight plans for Regional Entity delegated functions.
- Expand the efficiency and productivity of the ERO Enterprise through a disciplined approach to IT investments.
- Continue to efficiently and effectively manage resources within the ERO Enterprise.

- Quantitatively measure stakeholder satisfaction.

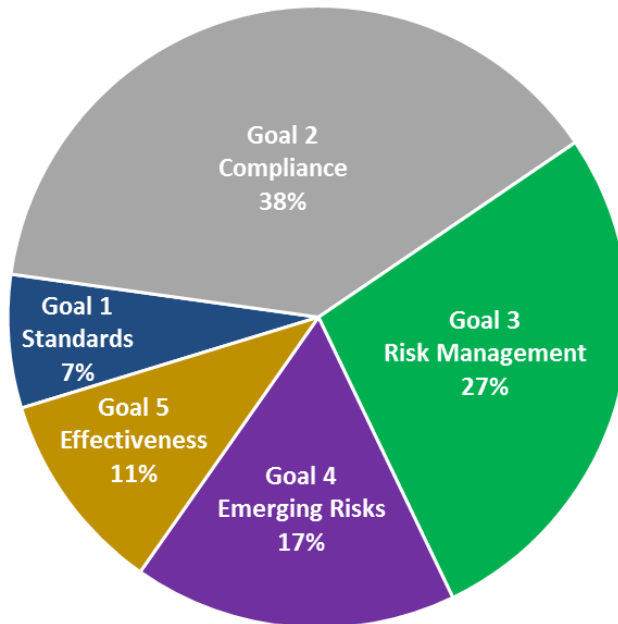
Allocation of NERC Resources to Strategic Goals and Risk Priorities

The charts below provide an overview of the allocation of both NERC and the ERO Enterprise’s 2018 resources associated with each strategic goal and the related contributing activities discussed above. Using surveys, funding sources, and FTEs as a guide, the charts reflect the relative amount of total resources (people and dollars) focused on supporting each of the five strategic goals noted above. Obviously many departments work on multiple activities that further multiple goals, and precision in forecasting all activities supporting each goal is not feasible. However, these charts provide a general picture regarding how resources are allocated.

NERC Resource Allocation to Strategic Goal Areas



ERO Enterprise Resource Allocation to Strategic Goal Areas



Ongoing Focus on Cost Control and Efficiency

NERC and the Regional Entities continue to work collaboratively to improve efficiency, evaluate resources, and leverage combined skillsets to improve various ERO Enterprise activities and control costs. This collaboration and the resulting efficiencies can be found in a number of areas, including but not limited to:

- ERO Enterprise IT Investments:** NERC and the Regional Entities, working collaboratively under the oversight of NERC's Standards Oversight and Technology Committee (SOTC), have developed a long-term enterprise information technology program resulting in a number of enterprise tools. The goal is to enhance operations, improve efficiency, and reduce costs at the NERC, regional and registered entity level. For example, enterprise tools have helped and will further facilitate efficiency of registration and data submittals, improved consistency in registered entity resources devoted to compliance, and improved overall reliability through information sharing on Events Analysis, protection system misoperations, and Situational Awareness.
- Enforcement:** NERC has worked closely with Regional Entities to streamline enforcement staff in connection with the development of more efficient and risk-based enforcement mechanisms.
- Standards:** As standards development has matured, NERC management has reallocated Standards staff towards more critical activities like cyber security and analytical capabilities.
- Legal:** As a result of the aforementioned efficiencies and the maturity of NERC's and ERO Enterprise's business processes, the legal department has reduced its resource requirements, reallocating limited resources to more critical priorities without increasing the company's overall staffing requirements.
- Forums:** As further described in the quarterly forum reports to the NERC Board, NERC and the Regional Entities continue to leverage the transmission and generation forums to jointly address risks to reliability to mitigate their impacts on the reliable operation of the BES.
- Industry:** The ERO Enterprise continues to collaborate with and rely on industry resources and expertise through the various standing committees, working groups, and task forces that are critical to both identifying and supporting key initiatives and priorities.

Additional information on the long-term efficiency goals can be found in Goal 6 of the draft *ERO Enterprise Operating Plan* and in Focus Area 5 of the draft *ERO Enterprise Long-term Strategy* that were posted to NERC's website in July 2017.⁸

2018 Key Business Planning Assumptions

As part of the annual business planning process, NERC and the Regional Entities developed a set of shared business planning assumptions supporting the development of their respective business plans and budgets. The Regional Entities used these assumptions to evaluate their projected workloads and determine resource levels and allocation required to complete necessary tasks and meet the obligations of their Regional Delegation Agreements. These common business planning assumptions are set forth in *Exhibit A – Shared Assumptions and Key Focus Areas*.

Application of Section 215 Criteria

In its order approving NERC's *2013 Business Plan and Budget*, FERC required NERC to establish criteria for determining whether its proposed activities are eligible for funding under Section 215. In an order dated April 19, 2013, FERC approved NERC's proposed criteria, with certain modifications.⁹ *Exhibit B – Application of NERC Section 215 Criteria* summarizes the major activities NERC proposes to undertake in 2018 and the approved Section 215 criteria applicable to such activities.

Overview of 2018 Budget and Funding Requirements

NERC's 2018 combined expense and fixed asset (capital) budget is approximately \$73.1M, which represents an increase of approximately \$3.5M (5.1%) from the 2017 budget. Total expenses are increasing approximately \$3.9M (5.9%) over 2017. The total fixed asset (capital) budget, excluding depreciation,¹⁰ is approximately \$3.9M, a decrease of \$498k (11.4%) from 2017. Approximately \$8.7M (11.9%) of NERC's 2018 budget is related to CRISP. As further explained in the *Electricity Information Sharing and Analysis Center (E-ISAC)* section of Section A, the majority of the NERC CRISP budget will be funded by participating utilities, with a small portion funded through assessments.

NERC's proposed 2018 assessment is approximately \$63.0M, which represents an increase of \$3.1M (5.1%) from 2017 and reflects the proposed release of \$600k of funds from the Assessment Stabilization Reserve to reduce 2018 assessments. Further, NERC proposes to deposit \$500k of Penalty collections during the 12 months ended June 30, 2017 into the Assessment Stabilization Reserve. Without the proposed release of funds from the Assessment Stabilization Reserve to offset assessments (as further discussed below), NERC's total average assessments would increase \$3.7M (6.1%) over 2017. One of the reasons that NERC's proposed 2018 budget increase is 5.1% while the proposed 2018 assessment increase is 6.1% (unadjusted) is that \$1.1M of funds was released from the Assessment Stabilization Reserve in 2017 to reduce assessments. Other factors contributing to the difference between the proposed budget increase and the proposed assessment increase include debt (capital financing) assumptions and provisions for reserves, all of which impact assessments in Canada, Mexico, and the U.S.

In order to stabilize assessments and align budget and assessment increases more closely, NERC has undertaken a multi-year strategy to manage assessment increases. NERC's policy *Accounting, Financial Statement and Budgetary Treatment of Penalties Imposed and Received for Violations of Reliability*

⁸ [NERC Strategic Documents webpage](#)

⁹ North American Electric Reliability Corporation, Order on Compliance, 143 FERC ¶ 61,052 (2013).

¹⁰ NERC and the Regional Entities budget Depreciation as an Operating Expense with an equal and offsetting credit against budgeted Fixed Asset (capital) additions. As a result, the budgets do not include depreciation in the funding requirements.

*Standards*¹¹ and NERC Rule of Procedure (ROP) §1107.2 specifies that Penalties received during the period July 1 through the following June 30 are to be used in the subsequent budget period to offset U.S. assessment billings. However, ROP §1107.4 provides for exceptions or alternatives to this treatment if approved by the Commission. In February 2015, NERC's Board approved an amendment to the company's Working Capital and Operating Reserve Policy.¹² Among the approved changes to this policy was the creation of an Assessment Stabilization Reserve.¹³ This reserve was established to implement the strategic goal of more closely aligning annual budget and U.S. assessment increases and to provide a mechanism to better manage year-to-year assessment increases. The eventual goal is to narrow the gap between annual percentage changes in NERC's budget and annual percentage changes in assessments that results from year-to-year variations in Penalty collections.

NERC proposes, subject to Commission approval, to (1) deposit the \$500k of Penalties collected during the period July 1, 2016 – June 30, 2017, into the Assessment Stabilization Reserve and (2) release \$600k from the Assessment Stabilization Reserve to reduce 2018 assessments. As a result, NERC proposes an overall average 2018 assessment increase of 5.1%. The allocation of assessments to Canadian entities will depend on the final determination and allocation of certain compliance and enforcement costs to Canadian entities pursuant to NERC's policy on the allocation of compliance costs.¹⁴

The following table provides a high-level year-over-year comparison of the major categories of expenses, total budget, and FTEs.

¹¹ Accounting, Financial Statement and Budgetary Treatment of Penalties Imposed and Received for Violations of Reliability Standards, December 8, 2008 and as amended August 15, 2013.

¹² [NERC's Working Capital and Operating Reserve Policy](#). NERC filed a petition with FERC on March 6, 2015 for approval of this policy; the Commission conditionally approved the revised policy in an order issued June 18, 2015, in Docket No. RR15-8-000. *North American Electric Reliability Corporation, Order Conditionally Accepting Revisions to Working Capital and Operating Reserve Policy*, 151 FERC ¶ 61,225 (2015). On August 14, 2015, NERC submitted a compliance filing to the June 18, 2015 order with a modification to the policy, which the Commission accepted by letter order dated September 18, 2015 (Docket No. RR15-8-001).

¹³ In accordance with the approved *Working Capital and Operating Reserve Policy*, the Assessment Stabilization Reserve may be funded with Penalty funds and surplus operating reserves. The actual amount of the contribution, as well as releases from the fund to reduce assessments, are determined annually as part of NERC's business plan and budget process, based on recommendation by the Board's Finance and Audit Committee and requiring both Board and FERC approval.

¹⁴ Expanded Policy on Allocation of Certain Compliance and Enforcement Costs, July 29, 2008.

Statement of Activities and Fixed Assets Expenditures 2017 and 2018 Budgets

STATUTORY

	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)	% Over (Under)
Funding						
ERO Funding						
NERC Assessments	\$ 59,856,314	\$ 59,856,314	\$ (0)	\$ 62,936,968	\$ 3,080,655	5.1%
Assessment Stabilization Reserve - Penalties	1,100,000	1,100,000	-	600,000	(500,000)	
Third-Party Funding (CRISP)	6,990,447	7,820,788	830,341	7,324,253	333,806	
Testing Fees	1,921,900	1,749,315	(172,585)	1,790,000	(131,900)	
Services & Software	50,000	50,000	0	50,000	0	
Workshops	230,000	305,300	75,300	185,000	(45,000)	
Interest	3,000	72,113	69,113	95,000	92,000	
Miscellaneous	-	-	-	-	-	
Total Funding	\$ 70,151,660	\$ 70,953,830	\$ 802,170	\$ 72,981,221	\$ 2,829,561	4.0%
Expenses						
Personnel Expenses	\$ 38,641,331	\$ 38,762,038	\$ 120,706	\$ 40,969,105	\$ 2,327,774	6.0%
Meeting Expenses	3,372,886	3,745,105	372,219	3,395,100	22,214	0.7%
Operating Expenses	24,800,690	27,237,596	2,436,906	26,352,371	1,551,682	6.3%
Other Non-Operating	106,725	106,725	-	138,878	32,153	30.1%
Total Expenses	\$ 66,921,632	\$ 69,851,464	\$ 2,929,832	\$ 70,855,455	\$ 3,933,822	5.9%
Fixed Assets						
Depreciation	\$ (1,691,457)	\$ (2,661,466)	\$ (970,009)	\$ (1,594,299)	\$ 97,158	
Computer & Software CapEx	2,572,000	2,348,141	(223,859)	2,549,000	(23,000)	
Equipment CapEx	1,800,000	1,059,772	(740,229)	1,175,000	(625,000)	
Leasehold Improvements	-	-	-	150,000	150,000	
Inc(Dec) in Fixed Assets	\$ 2,680,543	\$ 746,447	\$ (1,934,096)	\$ 2,279,701	\$ (400,842)	-15.0%
Total Budget	\$ 69,602,175	\$ 70,597,911	\$ 995,735	\$ 73,135,156	\$ 3,532,981	5.1%
FTEs	189.88	187.47	(2.41)	199.28	9.40	5.0%

NERC's 2018 budget and funding requirements reflect the resources necessary to support achievement of the goals and objectives set forth in the Strategic Plan. The 2018 budget is comprised of both operating and fixed asset (capital) costs. Operating costs generally include personnel, consulting, office space, software licensing, third-party data management, and communications and other customary services to support office operations. Fixed asset (capital) costs primarily reflect investments in equipment and software to support operations, including investments in the development of software applications and infrastructure to facilitate improved business processes and efficiency.

Key Budget Assumptions

Key assumptions used in the development of NERC's 2018 budget include the following:

- Increase of 9.40 full time equivalents (FTE) to provide additional support to the E-ISAC, including the addition of 6 FTEs as outlined in *Exhibit F – E-ISAC Long-Term Strategy*. Management routinely reviews resource allocations to ensure that the appropriate amount and type of resources are being dedicated to key priorities and activities. As operations in some areas become more efficient and/or major initiatives are completed, resources are redeployed to priority areas.
- Applying a 6.0% reduction to FTEs (vacancy rate), which is the same as 2017, to account for attrition and hiring delays. This assumption is based on a review and analysis of historic attrition and vacancy rates, as well as the time it takes to recruit and onboard new staff.
- Market-based compensation for personnel. Executive and staff compensation and benefits are established based on guidelines established by NERC's Corporate Governance and Human Resources Committee (CGHRC) and comprehensive market compensation and benefit information provided by a nationally recognized compensation and benefits consulting firm, as

well as other available data. An updated market study was completed in late 2015 under the oversight of NERC's CGHRC.

- Anticipated market increases in medical and dental benefit plan costs. Medical and dental premium cost estimates are based on market data provided by the company's benefits consultant. Current 2018 budget estimates are in the upper end of the range provided by NERC's benefits consultant. No other changes to retirement or other benefit plans have been assumed for 2018.
- Meeting and travel expenses are being held flat based on a review of 2016 and 2017 costs. The company has undertaken a number of significant efforts over the past several years to reduce travel and meeting expenses. For example, the company has worked closely with Regional Entities to share meeting space where possible, which has helped reduce meeting costs.
- Contract and consulting expenses are developed on a department-by-department basis and reflect both known and anticipated expenses, based on historical and current information. Expenses for the 2018 budget increased \$596k, primarily due to E-ISAC portal support and maintenance needs, as well the CRISP security review for which better cost information is known for the 2018 budget. Additional information on contract and consulting expenses can be found in *Exhibit C – Contractor and Consulting Costs*.

Fixed Asset (Capital) Budget and Capital Financing

NERC's 2018 capital budget is approximately \$3.9M (excluding depreciation), which represents a decrease of \$498k from 2017. This decrease is primarily the result of leasing audio visual and certain computer equipment, resulting in a reduction of Fixed Assets and an increase in Office Costs in the 2018 budget. The table below provides a summary of the major capital budget components.

NERC Capital Budget	Budget 2017	Budget 2018	Variance 2018 Budget v 2017	
			Budget	Variance %
ERO Application Development	\$ 700,000	\$ 2,148,000	\$ 1,448,000	206.9%
E-ISAC Portal Improvement	1,000,000	-	(1,000,000)	-100.0%
Document Management Program	335,000	-	(335,000)	-100.0%
Hardware (storage, servers)	991,000	805,000	(186,000)	-18.8%
Other Equipment	885,000	370,000	(515,000)	-58.2%
Disaster Recovery	150,000	100,000	(50,000)	-33.3%
NERC Software Licenses	311,000	301,000	(10,000)	-3.2%
Leasehold Improvements	-	150,000	150,000	100.0%
Total	\$ 4,372,000	\$ 3,874,000	\$ (498,000)	-11.4%

NERC has budgeted \$3.4M (both operating expenses and capital expenditures) in 2018 for services related to the planning, design, and implementation of software applications supporting the development of enterprise tools for common NERC and Regional Entity operations. These ERO Enterprise related costs include \$2.1M in capital expenditures and \$1.3M in other IT operating costs. Additional information regarding the ERO Enterprise IT strategy, the current status of the development of ERO Enterprise IT applications, and projects that will be under development in 2018 can be found in the *Information Technology* section of Section A. NERC's 2018 capital budget also includes ongoing funding for IT security, disaster recovery, data storage, replacement of servers and laptops, and software license costs. *Compliance Monitoring and Enforcement Program (CMEP) Technology Project*

The \$2.1M in fixed asset (capital) expenditures for 2018 relates to a new entity registration tool (\$600k) and a new CMEP tool (\$1.5M). The IT department is working closely with the Regional Entities in 2017 and through the 2018 – 2020 budget cycles to evaluate and implement strategic investments in tools that replace the current three applications with a single, common CMEP application. Items under consideration at this time include how Reliability Standards data is stored and maintained, as well as how best to support the various parts of the compliance and enforcement process (e.g., analysis of risk, development of implementation plans and audit schedules, actual compliance monitoring, and enforcement processing). The capital expenditure for the CMEP tool is expected to be approximately \$5-6M in total, with work spanning from 2017 thru 2020. Funding for this work will be subject to review and approval as part of the business plan and budget process each year. Investments are being made in 2017 to evaluate and scope the long-term project, with a final determination on the project scope expected later in 2017. If the 2018 business plan and budget is approved with the recommended funding, but the project does not go forward, the related funding will be held in the Operating Contingency Reserve. For additional information on the CMEP technology program, please see *Exhibit G – Compliance Monitoring and Enforcement Program Technology Project*.

The 2018 budget projection assumes that approximately \$2.1M of the total \$3.9M capital budget will be financed through the capital financing program that was described and put in place as part of NERC's 2014 *Business Plan and Budget*. Further information regarding capital financing can be found in *Exhibit D – Capital Financing*.

Working Capital and Operating Reserves

Management is proposing an overall reserve budget of \$7.5M for Working Capital, the four categories of Operating Reserves, and the Assessment Stabilization Reserve under the company's Working Capital and Operating Reserve Policy. This represents a decrease of \$283k (3.7%) from the total reserve amounts included in NERC's 2017 budget. The working capital and reserve balances are broken down in the following manner:

- **Working Capital:** Represents the amount of funds necessary to satisfy the company's projected cash flow needs during the budget year, taking into account the projected timing of the receipt of funding and timing of capital and operating expenses. While individual categories reflect increases and decreases resulting from operating needs and uses, the 2018 budget does not reflect additional working capital requirements in total.
- **Future Obligation Reserve:** Includes funding that has been received to satisfy future obligations under lease, credit, loan, or other agreements to which the company is a party. This reserve is primarily comprised of existing funds and is budgeted to be \$1.8M for 2018.
- **System Operator Certification Reserve:** Includes surplus funding from operator certification and testing fees that are above incurred expenses and shall be used solely to support operator testing and certification needs. The 2018 System Operator Certification Reserve is budgeted at \$700k and comprised of existing funds.
- **CRISP Reserve:** Represents funds dedicated to support CRISP. These reserves are established pursuant to a CRISP budget agreed to and funded entirely by utilities participating in CRISP. These reserves have no impact on assessments and they are segregated from other reserves pursuant to the terms of the CRISP agreements. The CRISP reserves are projected to be \$500k in the 2018 budget.
- **Operating Contingency Reserve:** Includes funds for contingencies that were not anticipated, assumed to be likely or the timing of which was uncertain, at the time of preparation and approval of the company's business plan and budget. NERC's current policy on Operating Contingency Reserves requires a reserve target of 3.5–7.0%, except as otherwise approved by the Board after review and recommendation by the NERC Finance and Audit Committee. This percentage is

calculated against NERC's total budget for operating and capital expenditures, less those costs related to CRISP and System Operator Certification, each of which has a separate reserve category. For the 2018 budget, management is recommending an Operating Contingency Reserve of approximately \$3.0M, or 4.7% of total budgeted operating and fixed asset (capital) costs.

- Assessment Stabilization Reserve:** To date, this reserve has been funded entirely by previously received Penalties and is projected to have a balance of \$2.2M as of January 1, 2018, including the proposed deposit of \$500k of Penalties received during the period July 1, 2016 – June 30, 2017 (subject to requisite approvals). For purposes of the company's 2018 BP&B, management proposes the release of \$600k of Assessment Stabilization Reserve funds to offset U.S. assessments. The remaining balance of \$1.6M in the Assessment Stabilization Reserve will be used to reduce U.S. assessments in one or more future periods, subject to review and approval by the NERC Board and the Commission in the applicable year's business plan and budget.

Department Budget and FTE Comparisons

The following table sets forth a 2017–2018 total budget comparison by department. The amounts shown below reflect all direct and indirect departmental costs, including fixed asset (capital) costs. Costs incurred for general and administrative and other overheads are considered indirect and are allocated to the statutory departments based on the ratio of that department's budgeted FTEs to total budgeted statutory FTEs.

2017–2018 Total Budget by Department

Total Budget	2017 Budget	2018 Budget	Change	
			2018 Budget v 2017 Budget	% Change
Reliability Standards	\$ 8,100,282	\$ 6,821,893	\$ (1,278,389)	-15.8%
Compliance Monitoring and Enforcement Programs*	17,305,535	20,465,126	3,159,591	18.3%
Reliability Assessments and System Analysis	7,535,594	7,312,956	(222,638)	-3.0%
Reliability Risk Management	14,387,923	13,641,560	(746,363)	-5.2%
Training, Education, and Personnel Certification	3,757,501	3,043,024	(714,477)	-19.0%
NERC Budget, excluding E-ISAC	\$ 51,086,835	\$ 51,284,559	\$ 197,724	0.4%
E-ISAC (non-CRISP)	\$ 10,222,901	\$ 13,130,686	\$ 2,907,785	28.4%
E-ISAC (CRISP)	8,292,440	8,719,912	427,471	5.2%
Total E-ISAC Budget	\$ 18,515,341	\$ 21,850,597	\$ 3,335,256	18.0%
Total Budget	\$ 69,602,175	\$ 73,135,156	\$ 3,532,981	5.1%

*Includes Entity Registration and CMEP Tool Development

The primary areas of increase are in Compliance Monitoring and Enforcement and E-ISAC. The increase in the Compliance Monitoring and Enforcement department costs are primarily due to the transfer of resources, including previously budgeted and open positions and related costs, to these departments from other departments, as well as the capital costs associated with development of the CMEP and Entity Registration applications, as further discussed below in the *Information Technology* section of Section A. The E-ISAC reflects additional staff related primarily to the long-term strategy discussed in *Exhibit F – E-ISAC Long-Term Strategy*. As noted in the Exhibit, the increase for 2018 due to the implementation of this strategy was approximately \$1.8M. Most of the additional costs noted in the above table reflect the allocation of general and administrative overhead costs based on the additional FTEs.

The decrease in the Reliability Standards, and Training, Education, and Personnel departments is largely the result of the transfer of personnel resources from these departments as part of the ongoing process of internal reorganization to better align resources to support strategic goals and risk priorities, which also results in lower indirect costs and allocation of fixed assets to these departments. Similarly, while the Reliability Risk Management budget does not have a decrease in personnel resources, the department is allocated fewer indirect costs and fixed assets because of the increase of personnel in other statutory programs.

The following table presents a 2018 versus 2017 comparison of budgeted FTEs by department and reflects 2017 personnel additions, interdepartmental transfers of previously budgeted positions, and attrition assumptions. The number of FTEs represents the number of employees employed full time during the year, plus the number of employees employed part time (less than full schedule), or during a portion of the year converted to a full-time basis. Headcount represents the total number of personnel employed during the year, regardless of the length of their employment during that year or whether they are full-time or part-time employees. FTEs will be less than headcount, unless there are no part-time employees and no employees who are employed less than a full year. The company's 2018 personnel budget is based upon existing headcount and associated compensation and benefit costs, as well as assumptions on the number and cost of new hires and the assumed vacancy rate, all within an overall FTE budget. An average vacancy rate is applied to each position and its associated costs to arrive at an overall personnel cost budget. The vacancy rate represents an adjustment, which is applied in the calculation of budgeted personnel costs to account for attrition and for variations from the budget assumptions on the timing of new hires.

2017–2018 Year-Over-Year Comparison of FTEs by Department

FTEs*	2017 Budget	2018 Budget	Change	
			2018 Budget v 2017 Budget	% Change
Reliability Standards	17.16	15.51	(1.65)	-9.6%
Compliance Monitoring and Enforcement Programs	36.19	40.89	4.70	13.0%
Reliability Assessments and System Analysis	14.10	14.10	-	0.0%
Reliability Risk Management	26.32	26.32	-	0.0%
Training, Education, and Personnel Certification	7.05	5.88	(1.17)	-16.6%
Administrative Programs	69.33	67.45	(1.88)	-2.7%
NERC FTEs, excluding E-ISAC	170.15	170.15	(0.00)	0.0%
E-ISAC (non-CRISP)	16.92	25.38	8.46	50.0%
E-ISAC (CRISP)	2.82	3.76	0.94	33.3%
Total E-ISAC FTEs	19.74	29.14	9.40	47.6%
Total FTEs	189.89	199.29	9.40	5.0%

* Reflects 2018 additions and transfers between departments, anticipated timing of 2018 hires, and assumes 6% attrition in all programs

Total FTEs in the Reliability Standards, Training, Education, and Personnel Certification, and Administrative programs is decreasing by 4.70 FTEs (5.0%), reflecting the reallocation of previously budgeted and open positions to the Compliance Assurance and Compliance Analysis, Organization Certification and

Registration departments. The increase in E-ISAC department FTEs addresses immediate analytical capability needs and also the additional costs related to the long-term strategy outlined in *Exhibit F – E-ISAC Long-Term Strategy*.

The NERC 2018 organizational chart can be found in Appendix 1. The difference between the number of positions reflected in the 2018 organizational chart and total 2018 budgeted FTEs is due to assumptions regarding vacancy rates and timing of new hires. The 2018 organizational chart in Appendix 1 includes the additional positions discussed in *Exhibit F – E-ISAC Long-Term Strategy*.

The following table includes a statement of activities comparing the 2017 budget and the 2018 budgets.

Statement of Activities and Fixed Assets Expenditures 2017 and 2018 Budgets

STATUTORY

	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)	% Inc 2018 over 2017
Funding						
ERO Funding						
NERC Assessments	\$ 59,856,314	\$ 59,856,314	\$ (0)	\$ 62,936,968	\$ 3,080,655	5.1%
Assessment Stabilization Reserve - Penalties	1,100,000	1,100,000	-	600,000	(500,000)	
Total NERC Funding	\$ 60,956,314	\$ 60,956,314	\$ (0)	\$ 63,536,968	\$ 2,580,655	
Third-Party Funding (CRISP)	\$ 6,990,447	\$ 7,400,905	\$ 410,458	\$ 7,324,253	\$ 333,806	
Testing Fees	1,921,900	1,749,315	(172,585)	1,790,000	(131,900)	
Services & Software	50,000	50,000	0	50,000	0	
Workshops	230,000	305,300	75,300	185,000	(45,000)	
Interest	3,000	115,999	112,999	95,000	92,000	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 70,151,660	\$ 70,577,832	\$ 426,172	\$ 72,981,221	\$ 2,829,561	4.0%
Expenses						
Personnel Expenses						
Salaries	\$ 30,073,438	\$ 30,222,616	\$ 149,177	\$ 31,791,098	\$ 1,717,659	
Payroll Taxes	1,847,130	1,822,452	(24,678)	1,949,557	102,426	
Benefits	3,643,806	3,736,337	92,531	3,988,886	345,080	
Retirement Costs	3,076,956	2,961,287	(115,670)	3,239,565	162,608	
Total Personnel Expenses	\$ 38,641,331	\$ 38,742,691	\$ 101,360	\$ 40,969,105	\$ 2,327,774	6.0%
Meeting Expenses						
Meetings	\$ 1,071,500	\$ 1,053,168	\$ (18,332)	\$ 1,071,500	\$ (0)	
Travel	2,203,786	2,248,220	44,434	2,204,000	214	
Conference Calls	97,600	157,553	59,953	119,600	22,000	
Total Meeting Expenses	\$ 3,372,886	\$ 3,458,942	\$ 86,056	\$ 3,395,100	\$ 22,214	0.7%
Operating Expenses						
Consultants & Contracts	\$ 13,127,749	\$ 14,378,546	\$ 1,250,797	\$ 13,724,185	\$ 596,437	
Office Rent	3,117,009	3,124,992	7,983	3,091,804	(25,205)	
Office Costs	4,359,340	4,599,488	240,148	5,365,084	1,005,744	
Professional Services	2,468,135	2,419,577	(48,558)	2,537,500	69,365	
Miscellaneous	37,000	52,613	15,613	39,500	2,500	
Depreciation	1,691,457	2,661,466	970,009	1,594,299	(97,158)	
Total Operating Expenses	\$ 24,800,690	\$ 27,236,682	\$ 2,435,993	\$ 26,352,371	\$ 1,551,682	6.3%
Total Direct Expenses	\$ 66,814,907	\$ 69,438,316	\$ 2,623,408	\$ 70,716,577	\$ 3,901,669	5.8%
Indirect Expenses	\$ 0	\$ -	\$ (0)	\$ 0	\$ 0	
Other Non-Operating Expenses	\$ 106,725	\$ 115,797	\$ 9,072	\$ 138,878	\$ 32,153	30.1%
Total Expenses (B)	\$ 66,921,632	\$ 69,554,112	\$ 2,632,480	\$ 70,855,455	\$ 3,933,822	5.9%
Change in Assets	\$ 3,230,028	\$ 1,023,720	\$ (2,206,308)	\$ 2,125,766	\$ (1,104,262)	
Fixed Assets						
Depreciation	\$ (1,691,457)	\$ (2,661,466)	\$ (970,009)	\$ (1,594,299)	\$ 97,158	
Computer & Software CapEx	2,572,000	2,417,441	(154,559)	2,549,000	(23,000)	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	1,800,000	1,189,772	(610,229)	1,175,000	(625,000)	
Leasehold Improvements	-	-	-	150,000	150,000	
Allocation of Fixed Assets	0	-	(0)	0	0	
Inc(Dec) in Fixed Assets (C)	\$ 2,680,543	\$ 945,747	\$ (1,734,796)	\$ 2,279,701	\$ (400,842)	-15.0%
TOTAL BUDGET (=B+C)	\$ 69,602,175	\$ 70,499,859	\$ 897,684	\$ 73,135,156	\$ 3,532,981	5.1%
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)¹	\$ 549,485	\$ 77,973	\$ (471,511)	\$ (153,935)	\$ (800,578)	
FTEs	189.88	189.24	(0.64)	199.28	9.40	5.0%

¹ Refer to Table B-1 for a complete analysis of the Working Capital and Operating Reserve balance.

FERC Order 830 – Geomagnetic Disturbance

In FERC’s Order No. 830 approving Reliability Standard TPL-007-1 (*Transmission System Planned Performance for Geomagnetic Disturbance Events*),¹⁵ FERC directed NERC to file a research work plan describing how NERC will conduct research into the specific geomagnetic disturbance (GMD)-related topics identified in the order. Since that time, NERC developed a preliminary GMD research work plan containing a set of GMD research activities, which was filed with FERC on May 30, 2017 in accordance with the Order No. 830 directive. The research activities identified in the preliminary plan are expected to advance the understanding of GMD events and the risks these high-impact, low-frequency events pose to the reliability of the BPS.

NERC is currently in the process of establishing the administrative components of the GMD research work plan, including the budget, project timeline, and assignment of project responsibilities. NERC expects that executing a GMD research plan of the type contemplated by Order No. 830 would require an extensive, multi-year effort requiring scientific and technical expertise from a variety of disciplines. Managing a large scale research project such as this is not a NERC “core competency,” which can accentuate and amplify the risks associated with executing the research called for in the plan. Further, NERC expects the costs to have a substantial impact on its budget, and consequently its annual assessments.

Therefore, NERC plans to continue to conduct outreach in the coming months with representatives from governmental agencies in the U.S., Europe, and Canada, academia, vendors, and industry to identify the GMD-related work that is currently in progress, determine where opportunities exist for research synergies, develop an appropriate research management structure, and identify alternative sources of funding. NERC will be conducting outreach to stakeholders regarding optimal approaches to structure the funding requirements, including opportunities for sharing costs, research management alternatives, and leveraging research responsibilities. These efforts, along with any comments and Commission guidance, would inform the final scope and structure of NERC’s project plan.

With this uncertainty of project management and funding alternatives, costs related to this research are not included in the 2018 BP&B. Once the way forward becomes clearer in the next 6-8 months, NERC will develop any additional budgetary materials and requests as needed.

E-ISAC Long-Term Strategy

Over the past several years the E-ISAC has focused on improving its technical and analytical capabilities with a goal of becoming the electricity industry’s leading, trusted source for analysis and sharing of security information. Significant support from the Electricity Subsector Coordinating Council (ESCC), the ESCC Members Executive Committee (MEC), the U.S. Department of Energy, and other stakeholders have helped the E-ISAC be responsive to the industry’s needs in order to provide unique insights, leadership, and coordination for security matters.

At the request of the NERC Board and under the guidance of the ESCC and MEC, executive leadership of the E-ISAC developed a long-term strategic plan, which is included as *Exhibit F – E-ISAC Long-Term Strategy*. The E-ISAC Long Term Strategic Plan was approved by the MEC on April 24, 2017 and accepted by the NERC Board of Trustees on May 11, 2017. The long-term strategic plan is to transform the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry.

To carry forth this vision, the E-ISAC is planning a continuous and deliberate growth strategy over the next five years that increases both staff and technical resources. Based on industry and stakeholder feedback,

¹⁵ [FERC Order 830 - Reliability Standard for Transmission System Planned Performance for Geomagnetic Disturbance Events](#)

the 2018 BP&B includes the first year's recommended additions related to this strategy, primarily related to analytical capabilities, as further described in *Exhibit F – E-ISAC Long-Term Strategy*.

The assumptions and projections included herein and that follow for 2019 and 2020 include the impacts of the E-ISAC strategic plan discussed in *Exhibit F – E-ISAC Long-Term Strategy*. The strategy discussed in that exhibit reflects additional resources, technology, and facilities for the long-term success of the E-ISAC.

Projections for 2019–2020

Management has developed preliminary operating and fixed asset (capital) projections for 2019 and 2020. The significant assumptions considered in preparing these projections include:

- No increases in total FTEs over the 2018 budget except for the impacts of the long-term E-ISAC strategy discussed in *Exhibit F – E-ISAC Long-Term Strategy*.
- Personnel and benefit cost increases per FTE are consistent with the 2018 budget assumptions.
- Operating costs, including contractor and consulting expenses, are higher due to increases in costs for rent and maintenance costs associated with software applications supporting ERO Enterprise Operations.
- Debt service repayment obligations in connection with the company's Capital Financing Program are consistent with the projected Enterprise IT Applications capital forecast. The most significant work over the next three years will relate to the Compliance Monitoring and Enforcement Technology Program. Current estimates are approximately \$5-6M between 2017 and 2020. NERC anticipates using the Capital Financing Program as the primary funding source for that project. For additional information on the Compliance Monitoring and Enforcement Technology Program, please see *Exhibit G – Compliance Monitoring and Enforcement Program Technology Project*.
- No increase in CRISP-related expenditures, except for personnel and benefit cost increases as noted above.

NERC's goal is to align assessments and budget increases closely together over the next three to five years. The goal is to minimize fluctuations so that year-to-year variations in receipt of Penalties will not cause large year-to-year variations in future U.S. assessments. Currently, NERC projects assessments to increase 5.1% in 2018, 8.9% in 2019, and 4.0% in 2020 with a planned release of Assessment Stabilization Reserves for 2018 of \$600k. The projected increases for 2019 and 2020 do not assume any releases of funds from the Assessment Stabilization Reserve. Future releases of these reserves will be determined each year during the budget approval process. NERC models future periods without assuming the receipt of Penalties beyond those NERC currently expects to receive. As Penalties are received, NERC assumes that the NERC Board and the Commission will approve the Penalties as contributions to the Assessment Stabilization Reserve, for use when appropriate to prevent large year-to-year fluctuations in assessments.¹⁶

¹⁶ The company's *Working Capital and Operating Reserve Policy* requires that in determining the amount of the Assessment Stabilization Reserve that is released each year, the NERC Finance and Audit Committee and Board is to review a three-year forecast of assessments, as well as the availability of funding for the Assessment Stabilization Reserve from surplus funds and Penalty funds. The actual contributions to and releases from the Assessment Stabilization Reserve in any year must be approved by the Board and the Commission as part of NERC's annual business plan and budget process, with opportunity for review and input by stakeholders.

The budget and assessment increases for 2019 and 2020 are projections that will be refined as those budgets are finalized. In particular, the 2019 year includes the intersection of various projects that cause that budget and assessment increase to be higher. NERC will be working to prioritize projects and costs ahead of the 2019 budget year to ensure the most reasonable budget and assessment increases possible.

Statement of Activities and Fixed Assets Expenditures
2018 Budget & Projected 2019 and 2020 Budgets

	2018 Budget	2019 Projection	\$ Change 19 v 18	% Change 19 v 18	2020 Projection	\$ Change 20 v 19	% Change 20 v 19
Funding							
ERO Funding							
NERC Assessments	\$ 62,936,968	\$ 68,552,100	\$ 5,615,132	8.9%	\$ 71,308,353	\$ 2,756,253	4.0%
Assessment Stabilization Reserve - Penalties	600,000	-	(600,000)	-100.0%	-	-	0.0%
Total NERC Funding	\$ 63,536,968	\$ 68,552,100	\$ 5,015,132	7.9%	\$ 71,308,353	\$ 2,756,253	4.0%
Third-Party Funding (CRISP)	\$ 7,324,253	\$ 7,351,310	\$ 27,057	0.4%	\$ 7,366,464	\$ 15,154	0.2%
Testing Fees	1,790,000	1,790,000	-	0.0%	1,790,000	-	0.0%
Services & Software	50,000	50,000	-	0.0%	50,000	-	0.0%
Workshops	185,000	185,000	-	0.0%	185,000	-	0.0%
Interest	95,000	95,000	-	0.0%	95,000	0	0.0%
Miscellaneous	-	-	-	0.0%	-	-	0.0%
Total Funding (A)	\$ 72,981,221	\$ 78,023,410	\$ 5,042,189	6.9%	\$ 80,794,817	\$ 2,771,407	3.6%
Expenses							
Personnel Expenses							
Salaries	\$ 31,791,098	\$ 33,898,558	\$ 2,107,460	6.6%	\$ 35,526,511	\$ 1,627,953	4.8%
Payroll Taxes	1,949,557	2,055,989	106,432	5.5%	2,126,649	70,660	3.4%
Benefits	3,988,886	4,286,714	297,828	7.5%	4,534,750	248,036	5.8%
Retirement Costs	3,239,565	3,461,443	221,878	6.8%	3,632,191	170,748	4.9%
Total Personnel Expenses	\$ 40,969,105	\$ 43,702,703	\$ 2,733,598	6.7%	\$ 45,820,101	\$ 2,117,398	4.8%
Meeting Expenses							
Meetings	\$ 1,071,500	\$ 1,071,500	\$ -	0.0%	\$ 1,071,500	\$ -	0.0%
Travel	2,204,000	2,204,000	-	0.0%	2,204,000	-	0.0%
Conference Calls	119,600	139,600	20,000	16.7%	139,600	-	0.0%
Total Meeting Expenses	\$ 3,395,100	\$ 3,415,100	\$ 20,000	0.6%	\$ 3,415,100	\$ -	0.0%
Operating Expenses							
Consultants & Contracts	\$ 13,724,185	\$ 14,131,529	\$ 407,344	3.0%	\$ 14,009,707	\$ (121,822)	-0.9%
Office Rent	3,091,804	3,091,804	0	0.0%	3,091,804	-	0.0%
Office Costs	5,365,084	5,877,971	512,887	9.6%	6,572,148	694,177	11.8%
Professional Services	2,537,500	2,535,340	(2,160)	-0.1%	2,544,295	8,955	0.4%
Miscellaneous	39,500	39,500	-	0.0%	39,500	-	0.0%
Depreciation	1,594,299	1,321,972	(272,326)	-17.1%	1,073,181	(248,791)	-18.8%
Total Operating Expenses	\$ 26,352,371	\$ 26,998,116	\$ 645,745	2.5%	\$ 27,330,636	\$ 332,519	1.2%
Total Direct Expenses	\$ 70,716,577	\$ 74,115,920	\$ 3,399,343	4.8%	\$ 76,565,837	\$ 2,449,917	3.3%
Indirect Expenses	\$ 0	\$ 0	\$ 0	0.0%	\$ 0	\$ (0)	0.0%
Other Non-Operating Expenses	\$ 138,878	\$ 171,744	\$ 32,866	23.7%	\$ 205,335	\$ 33,591	19.6%
Total Expenses (B)	\$ 70,855,455	\$ 74,287,664	\$ 3,432,209	4.8%	\$ 76,771,172	\$ 2,483,508	3.3%
Change in Assets	\$ 2,125,766	\$ 3,735,746	\$ 1,609,980	75.7%	\$ 4,023,645	\$ 287,899	7.7%
Fixed Assets							
Depreciation	\$ (1,594,299)	\$ (1,321,972)	\$ 272,326	-17.1%	\$ (1,073,181)	\$ 248,791	-18.8%
Computer & Software CapEx	2,549,000	3,519,000	970,000	38.1%	2,858,000	(661,000)	-18.8%
Furniture & Fixtures CapEx	-	-	-	0.0%	-	-	0.0%
Equipment CapEx	1,175,000	1,480,000	305,000	26.0%	1,530,000	50,000	3.4%
Leasehold Improvements	150,000	100,000	(50,000)	-33.3%	100,000	-	0.0%
Allocation of Fixed Assets	0	0	0	0.0%	(0)	(0)	0.0%
Inc(Dec) in Fixed Assets (C)	\$ 2,279,701	\$ 3,777,028	\$ 1,497,326	65.7%	\$ 3,414,819	\$ (362,209)	-9.6%
TOTAL BUDGET (=B+C)	\$ 73,135,156	\$ 78,064,692	\$ 4,929,535	6.7%	\$ 80,185,991	\$ 2,121,299	2.7%
FTEs	199.28	207.74	8.46	4.2%	212.44	4.70	2.3%

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Reliability Standards

Reliability Standards Program (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	17.16	15.51	(1.65)
Direct Expenses	\$ 3,861,666	\$ 3,332,944	\$ (528,722)
Indirect Expenses	4,180,279	3,470,011	(710,268)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	58,337	18,939	(39,399)
TOTAL BUDGET	\$ 8,100,282	\$ 6,821,893	\$ (1,278,389)

Background and Scope

The reliability standards program carries out the ERO's statutory responsibility to develop, adopt, obtain approval of, and modify (as and when appropriate) mandatory reliability standards (both continent-wide standards and regional reliability standards) for the reliable planning, operation, and critical infrastructure protection of the North American BES. The major activities undertaken by the Standards department include:

- **Delivering high-quality, continent-wide reliability standards:** NERC standard developers and other standards staff provide project management and leadership to develop solutions necessary to address reliability risks identified through the Reliability Risk Management Process (RRMP). These may include the development of, or modifications to, NERC reliability standards through standard development outreach activities, facilitation of drafting team activities, drafting support, assisting drafting teams in maintaining adherence to the development process as outlined in the *Standard Processes Manual*, and ensuring that the quality of documents produced is appropriate for approval by industry and the Board.
- **Facilitating continent-wide industry engagement:** NERC manages the work of over 200 industry contributors who serve on the Standards Committee, subgroups, and other project teams for the development of NERC reliability standards through the standards development program.
- **Conducting balloting, disseminating information, and supporting regulatory filings:** Through NERC's commenting and ANSI-accredited balloting process, industry consensus is built by engaging thousands of industry volunteers within hundreds of registered entities throughout North America who review, comment on, and approve the standards created by the standard drafting teams. The department also supports the filing of standards with applicable regulatory authorities and provides support with regulatory proceedings.

The reliability standards program provides a mechanism for the eight Regional Entities to process regional standards when unique regional reliability gaps are detected, or incorporate Regional variances into continent-wide standards. The NERC Standards department staff supports regional standards development processes by providing technical advice, final quality review of regional standards, presentation to the Board, and preparation of regional standards materials for submission for standard adoption to the applicable regulatory authorities in the U.S. and Canada.

Stakeholder Engagement and Cost Effectiveness Project

As part of the standard development process, industry technical experts scope, draft, and review the new or revised NERC reliability standards for approval by the industry ballot body, adoption by the Board, and filing with regulatory authorities in the U.S. and Canada. Additionally, Federal, State and Provincial regulatory authorities, the NERC Board, Regional Entities, and many industry stakeholders have expressed interest in the identification of costs incurred from implementing NERC reliability standards compared to risks they address. The objective is to ensure that these elements are considered during the standards development and revision process. A pilot was conducted in 2016 to develop an approach to determine the level of cost versus the reliability benefit to mitigate an identified risk. Work will continue in 2017 on refining the approach and developing additional means to evaluate cost impacts of the existing body of standards.

Key Efforts Underway

NERC will ensure that the Reliability Standards Development Plan (RSDP) is effectively executed and that reliability standards are focused on and mitigate significant risks to BES reliability. Department resources will be focused on supporting the ERO Enterprise Strategic Plan, including but not limited to support of the RRMP and resolving FERC directives. The Standards department will:

1. **Focus on the selection of projects undertaken.** Resources will be expended on issues determined to be a reliability risk through the RRMP (also see the Reliability Assessment and System Analysis section and the Performance Analysis section below for additional detail). The department will apply broader project management skills to implement a variety of solutions to a reliability concern. An effective solution to an identified reliability risk may be a Reliability Standard, or it may be a guideline, information request, training, NERC Alert, technical conference, research, or a combination of these or other tools.
2. **Address FERC directives and respond to FERC orders** through standards development projects, as necessary. Each project will determine whether: (1) the directive will be complied with as issued, (2) there is an equally effective and efficient way to address the concern that fostered the directive, or (3) there is technical justification (including that the directive has been overcome by events, processes, or advances in technology) that resolution of the directive is no longer needed.
3. **Perform periodic reviews.** In 2017, industry and NERC will determine whether there is a need to make further improvements to the standards through periodic reviews that include: (1) a measured review of the content of standards, considering whether the requirements could more effectively mitigate risks to the BPS, (2) whether the standards are results based and drafted with high quality, (3) whether the standards are concise or if the number of requirements could be reduced, and (4) whether compliance expectations are clear.
4. **Facilitate smooth transition to new standards.** This includes working with the Compliance Monitoring and Enforcement and Organization Registration and Certification, Reliability Assessment and System Analysis, and Performance Analysis programs to develop guidelines, webinars, and other activities to support auditor and industry training for the new standards.
5. **Perform a comprehensive review of standards.** In 2017, NERC and industry will complete a comprehensive review of NERC's Reliability Standards to measure their effectiveness and ability to mitigate the risks to the reliability and security of the bulk power system, compared to the industry burden for their implementation. An outcome of this review will inform the need to retire or enhance requirements based on operational experience. This will include an analysis of reliability risk and cost effectiveness. In 2018, projects will be initiated to address the results of this review to retire or modify Reliability Standards.

The 2018–2020 RSDP will be developed in 2017 in conjunction with the Standards Committee, RISC, and RRMP. It will outline the work plan for the continued evaluation of NERC reliability standards, the Standards department’s support of Reliability Risk Management, and resolution of FERC directives. Additionally, standards grading metrics will be used to measure the overall quality of each enforceable reliability standard as a basis for measuring needed improvements.

2018 Goals and Deliverables

In 2016, the majority of FERC directives were addressed, as well as the remaining recommendations for retiring requirements made by the Paragraph 81 project and the independent experts. In 2017, the body of standards will be reviewed for potential improvements while considering quality and content criteria, as well as results-based standards principles. The NERC Standards staff will continue to address any new directives issued by FERC, as well as any reliability risks identified through RRMP or by the RISC for which a reliability standard is part of the solution.

Resource Requirements

Personnel

The 1.65 reduction in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Consultants and Contracts

No consultants and contracts support is budgeted in 2018, which is consistent with the 2017 budget.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
RELIABILITY STANDARDS					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 7,835,213	\$ 7,835,213	\$ 0	\$ 6,689,437	\$ (1,145,776)
Assessment Stabilization Reserve - Penalties	159,642	159,642	(0)	71,739	(87,903)
Total NERC Funding	\$ 7,994,855	\$ 7,994,855	\$ 0	\$ 6,761,176	\$ (1,233,679)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	105,000	105,000	-	50,000	(55,000)
Interest	427	14,316	13,889	10,717	10,291
Miscellaneous	-	-	-	-	-
Total Funding	\$ 8,100,282	\$ 8,114,171	\$ 13,889	\$ 6,821,893	\$ (1,278,389)
Expenses					
Personnel Expenses					
Salaries	\$ 2,340,405	\$ 2,193,752	\$ (146,653)	\$ 2,207,431	\$ (132,975)
Payroll Taxes	151,658	137,199	(14,459)	145,638	(6,020)
Benefits	307,085	294,123	(12,962)	299,194	(7,891)
Retirement Costs	259,407	231,949	(27,459)	246,107	(13,300)
Total Personnel Expenses	\$ 3,058,556	\$ 2,857,023	\$ (201,533)	\$ 2,898,370	\$ (160,186)
Meeting Expenses					
Meetings	\$ 207,000	\$ 103,500	\$ (103,500)	\$ 105,000	\$ (102,000)
Travel	271,988	230,000	(41,988)	240,000	(31,988)
Conference Calls	40,565	19,848	(20,717)	-	(40,565)
Total Meeting Expenses	\$ 519,553	\$ 353,348	\$ (166,206)	\$ 345,000	\$ (174,553)
Operating Expenses					
Consultants & Contracts	\$ -	\$ 40,000	\$ 40,000	\$ -	\$ -
Office Rent	-	-	-	-	-
Office Costs	51,336	44,033	(7,303)	49,796	(1,540)
Professional Services	-	-	-	-	-
Miscellaneous	500	250	(250)	500	-
Depreciation	231,721	253,432	21,711	39,278	(192,443)
Total Operating Expenses	\$ 283,556	\$ 337,715	\$ 54,159	\$ 89,574	\$ (193,983)
Total Direct Expenses	\$ 3,861,666	\$ 3,548,086	\$ (313,580)	\$ 3,332,944	\$ (528,722)
Indirect Expenses	\$ 4,180,279	\$ 3,986,697	\$ (193,582)	\$ 3,470,011	\$ (710,268)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 8,041,945	\$ 7,534,783	\$ (507,162)	\$ 6,802,955	\$ (1,238,990)
Change in Assets	\$ 58,337	\$ 579,388	\$ 521,051	\$ 18,939	\$ (39,399)
Fixed Assets					
Depreciation	\$ (231,721)	\$ (253,432)	\$ (21,711)	\$ (39,278)	\$ 192,443
Computer & Software CapEx	-	68,114	68,114	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	290,058	(3,796)	(293,854)	58,217	(231,841)
Inc(Dec) in Fixed Assets (B)	\$ 58,337	\$ (189,114)	\$ (247,451)	\$ 18,939	\$ (39,399)
TOTAL BUDGET (=A+B)	\$ 8,100,282	\$ 7,345,669	\$ (754,613)	\$ 6,821,893	\$ (1,278,389)
FTEs	17.16	15.91	(1.25)	15.51	(1.65)

Compliance Monitoring and Enforcement and Organization Registration and Certification

The Compliance Monitoring and Enforcement, and Organization Registration and Certification program area's purpose is to monitor, enforce, and ensure registered entity compliance with the ERO's mandatory reliability standards. This program area is addressed by three operational groups: 1) Compliance Assurance (addressing compliance monitoring), 2) Compliance Analysis, Certification and Registration (addressing assurance, organization registration and certification), and 3) Compliance Enforcement.

Compliance Assurance

Compliance Assurance (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	15.51	19.27	3.76
Direct Expenses	\$ 3,816,924	\$ 4,520,550	\$ 703,625
Indirect Expenses	3,779,431	4,311,226	531,795
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	262,244	72,330	(189,914)
TOTAL BUDGET	\$ 7,858,599	\$ 8,904,105	\$ 1,045,506

Background and Scope

Compliance Assurance addresses the Regional Entities' implementation of the compliance monitoring section of the CMEP. NERC's Compliance Assurance group works collaboratively with the eight Regional Entities to ensure effective implementation of risk-based compliance monitoring under the CMEP across the entire ERO Enterprise. This program ensures that Regional Entities monitor registered entities for compliance according to their own specific facts and circumstances, including the entity's inherent risks, evaluation of controls in place to mitigate the inherent risks, and any aggravating factors. The CMEP provides for Regional Entities to develop customized compliance oversight plans (COPs) for each registered entity that identifies: 1) the standards or requirements to be monitored, 2) the monitoring processes (tools) for use by the Regional Entities, including compliance audits, self-certification, spot checking, self-reporting, and 3) the interval of monitoring. NERC and the Regional Entities ensure that inherent risk assessments (IRAs) for registered entities begin with a consistent framework and that Regional Entities' implementation of the CMEP coalesce around best practices, data management procedures that address data reporting requirements, integrity, retention, security, and confidentiality.

The Compliance Assurance group's responsibilities include but are not limited to the following major activities and functions:

- Oversight of the Regional Entities' implementation of the risk-based compliance monitoring program and NERC ROP in North America;
- Development and execution of the annual CMEP Implementation Plan (IP);
- Oversight of the use of necessary compliance-related processes, procedures, IT platforms, tools, and templates;
- Development and delivery of education and training for ERO Enterprise staff;

- Critical Infrastructure Protection (CIP) Version 5 Reliability Standards and subsequent enhancements to the CIP Standards activities related to education programs that support industry compliance and security;
- CIP-014-2 training and outreach activities related to effective implementation of the Physical Security Reliability Standard;
- Coordination with the NERC Standards department for standard development to assist in the smooth transition for standards from development to enforceability and feedback on risks seen in the field that are not addressed by a standard, as well as information on where a standard is too broad; and
- Support for Regional Entity and industry committees, working groups, and task forces, such as the NERC CCC and NERC Critical Infrastructure Protection Committee (CIPC).

Strategic Goal Related to CMEP

Strategic Goal 2: Objective and Risk-informed Compliance Monitoring, Enforcement, and Organization Certification and Registration

Goal Description: The ERO Enterprise is a strong enforcement authority that is objective, fair, and promotes a culture of reliability excellence through risk-informed compliance monitoring, enforcement, certification, and registration.

The risk-based compliance monitoring approach allows for the appropriate allocation of resources to the issues that pose a higher level of risk to the reliability of the BPS.

Stakeholder Engagement and Benefit

NERC continues to promote the Regional Entities' development of customized COPs for registered entities. As the risk-based compliance monitoring approach was implemented in 2015 and 2016, Regional Entities worked closely with stakeholders to develop IRAs and appropriately scope compliance monitoring activities. As this process continues to mature, Regional Entities will continue to customize compliance monitoring tools and frequency of monitoring for each registered entity, based on its IRA as well as additional considerations such as risk elements, entity performance, internal controls, and mitigating activities to inform the development of their COPs.

Compliance Assurance continues to work closely with the standard development program to provide compliance information, statistics, and perspectives to drafting teams fostering the development of standards that provide an increased reliability benefit and clarify compliance risks. This collaboration with industry and Standards department staff will occur early in the standard development process by providing draft compliance monitoring guidance, including information on how compliance with draft standards will be determined, as well as input to the drafting teams on the auditability and enforceability of the draft standards. This will ensure that ERO Enterprise tools used in the auditing process, such as the reliability standards auditing worksheet (RSAW), do not expand or modify standards requirements.

NERC also continues to provide industry-focused outreach events and webinars on the ERO Enterprise's approaches to risk-based CMEP activities. The ERO Enterprise staff will continue its webinar series providing guidance on standards and requirements associated with the 2017 risk elements identified for consideration for compliance monitoring.

Key Efforts Underway

Risk-Based CMEP Implementation

Ensuring the successful implementation of NERC's risk-based CMEP remains the priority of Compliance Assurance's oversight plan. As part of that oversight, and in addition to offering regular feedback to the Regional Entities, NERC will continue to identify areas for improvement or promoting consistency through training, guidance, or adjustments during the following year. NERC also produces an ERO Enterprise CMEP annual report, which includes an assessment of the risk-based CMEP implementation.

NERC performs oversight of the Regional Entities' compliance monitoring programs primarily through the review of the processes, supporting evidence, observations, and other information provided by the Regional Entities over the course of focused engagements of program areas that are scheduled throughout the year. NERC communicates the recommendations and findings to the Regional Entities to help the ERO Enterprise develop responsive strategies and solutions to potential issues and ensure uniform and consistent implementation of the CMEP. Such recommendations and findings also help identify priority areas for training of ERO Enterprise staff during the year.

NERC Oversight of Risk-Based Compliance Monitoring

Consistent with the goals and objectives set forth in the strategic plan, NERC will continue to implement risk-based compliance monitoring and enforcement as part of its stated objectives of ensuring BES reliability, consistency, improving the efficiency and effectiveness of NERC and Regional Entity compliance and enforcement operations, focusing on identified risks and reducing unnecessary burdens on registered entities.

CIP Compliance

NERC and the Regional Entities continue to manage the smooth implementation of compliance activities for CIP Version 5 and subsequent enhancements to the CIP Standards by providing training, webinars, and other forms of outreach. The ERO Enterprise will continue to provide educational programs to support industry compliance and the integration of risk assessment and internal controls. In addition, NERC and the Regional Entities will continue supporting the successful implementation and monitoring of the physical security reliability standard.

Compliance Monitoring and Enforcement Process Tool

For 2017 and through the 2018 – 2020 budget cycle, NERC will develop and implement the CMEP Process tool that supports the CMEP, including the various processes and activities of the compliance and enforcement program (e.g., analysis of risk, development of implementation plans and audit schedules, actual compliance monitoring, and enforcement processing).

Regional Entity Training

NERC Compliance Assurance will provide training to Regional Entity staff on the most important elements of risk-based compliance monitoring, including enhancements to registered entity IRAs, internal controls reviews, compliance oversight plan development, as well as Reliability Standards monitoring. NERC will develop this training based on observations from its oversight activities of the Regional Entities, as well as the process reviews described above.

Emerging Technology Roundtables

NERC Compliance Assurance will continue to periodically host an Emerging Technology Roundtable with industry and vendors that includes in-depth discussions around the integration of emerging technologies associated with BPS operations to address and mitigate cyber and physical security risks of the BPS.

2018 Goals and Deliverables

The Compliance Assurance group has several goals and deliverables that support the 2017-2020 *ERO Enterprise Strategic Plan*. Resources will be focused on improvements implemented as a result of the risk-based compliance monitoring activities in 2016 and 2017. Specific 2018 objectives for this group are:

- Continue to mature the risk-based compliance monitoring program, including ongoing oversight of the risk-based CMEP, including IRAs, consideration of internal controls, coordinated oversight of multi-region registered entities, and ensuring that COPs are addressing the relevant risks.
- Work closely with NERC's Enforcement and IT departments, as well as staff in the Regional Entities, to help develop application business requirements and to test business functionality for ERO Enterprise CMEP Process Tool.
- Support the continued successful implementation of the CIP Version 5 Reliability Standards and subsequent enhancements that become effective in 2017 and beyond.
- Continue to monitor and support effective implementation of the Physical Security Reliability Standard.
- Continue to enhance and implement training to support monitoring of Reliability Standards, integrating principles from the ERO Auditor Capabilities and Competencies Guide.
- Continue feedback to Standards through integration and coordination between the standards and compliance functions for clear stakeholder implementation and feedback on risks seen in the field that are not addressed by a standard, as well as information on where a standard is too broad. This effort will be supported through a common set of RSAWs, guidance, and outreach.
- Support International CMEP activities including reliability and security subject matter expertise and outreach.
- Provide support and leadership to (1) the CIPC and (2) standing committees' subcommittees, working groups, and task forces serving the standing committee. Support the CIPC leadership and development and implementation of the annual CIPC work plan.
- Provide support and leadership to (1) the CCC and (2) standing committees' subcommittees, working groups, and task forces serving the standing committee. Support the CCC leadership and the development and implementation of the annual CCC work plan.

These 2018 activities are necessary to further implement risk-based compliance monitoring, including the CIP standards, and integrate the standards and compliance functions. A number of activities that support the implementation of the strategic risk-based reforms are intended to reduce regulatory burden by focusing monitoring according to each registered entity's potential impact on the BPS.

Resource Requirements

Personnel

The 3.76 increase in Compliance Assurance FTEs, which is reflective of reallocating resources from other departments to this one, is the result of NERC's plan to strengthen the implementation and oversight of the risk-based CMEP, risk analysis, and feedback loops. This includes:

- Data analysis and trending for emerging reliability and security risks;
- Support the development of the CMEP process tool to improve documentation, sharing, analysis, and more closely align CMEP processes;
- Identification and mitigation of significant risks;

- Subject matter expertise for training and oversight of Reliability Standards;
- Participation and input into the Reliability Standards process including providing compliance and subject matter expertise;
- Support international compliance activities; and
- Support the NERC CIPC.

Consultants and Contracts

Funds budgeted for outside consultants to assist in successful implementation of risk-based compliance monitoring remains unchanged at \$50k. The budgeted amounts for 2017 and 2018 are shown in *Exhibit C – Contractor and Consulting Costs*. Some consultant resources continue to be needed to support the transformation of NERC's Compliance Monitoring and Enforcement Program to a risk-based design. The IT budget includes funding for the maintenance of existing software tools supporting compliance assessment, registration, certification, and enforcement activities, as well as the investigation and development of a business case for future tools supporting ERO Enterprise compliance assessment, registration, and certification and enforcement activities.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
COMPLIANCE ASSURANCE					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 7,713,879	\$ 7,713,879	\$ 0	\$ 8,801,659	\$ 1,087,780
Assessment Stabilization Reserve - Penalties	144,334	144,334	0	89,130	(55,204)
Total NERC Funding	\$ 7,858,213	\$ 7,858,213	\$ 0	\$ 8,890,790	\$ 1,032,577
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	386	14,609	14,223	13,316	12,930
Miscellaneous	-	-	-	-	-
Total Funding	\$ 7,858,599	\$ 7,872,822	\$ 14,223	\$ 8,904,105	\$ 1,045,506
Expenses					
Personnel Expenses					
Salaries	\$ 2,509,618	\$ 2,738,350	\$ 228,732	\$ 2,936,161	\$ 426,543
Payroll Taxes	163,335	180,120	16,784	192,067	28,732
Benefits	333,557	357,220	23,663	398,424	64,867
Retirement Costs	276,273	306,359	30,086	324,835	48,562
Total Personnel Expenses	\$ 3,282,783	\$ 3,582,050	\$ 299,266	\$ 3,851,487	\$ 568,703
Meeting Expenses					
Meetings	\$ 60,000	\$ 123,418	\$ 63,418	\$ 200,000	\$ 140,000
Travel	276,343	277,000	657	375,000	98,657
Conference Calls	6,100	9,420	3,320	-	(6,100)
Total Meeting Expenses	\$ 342,443	\$ 409,838	\$ 67,395	\$ 575,000	\$ 232,557
Operating Expenses					
Consultants & Contracts	\$ 50,000	\$ 35,800	\$ (14,200)	\$ 50,000	\$ 0
Office Rent	-	-	-	-	-
Office Costs	141,198	124,702	(16,496)	43,563	(97,635)
Professional Services	-	-	-	-	-
Miscellaneous	500	250	(250)	500	-
Depreciation	-	-	-	-	-
Total Operating Expenses	\$ 191,698	\$ 160,752	\$ (30,946)	\$ 94,063	\$ (97,635)
Total Direct Expenses	\$ 3,816,924	\$ 4,152,639	\$ 335,715	\$ 4,520,550	\$ 703,625
Indirect Expenses	\$ 3,779,431	\$ 4,299,920	\$ 520,489	\$ 4,311,226	\$ 531,795
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 7,596,355	\$ 8,452,559	\$ 856,205	\$ 8,831,775	\$ 1,235,421
Change in Assets	\$ 262,244	\$ (579,738)	\$ (841,982)	\$ 72,330	\$ (189,914)
Fixed Assets					
Depreciation	\$ -	\$ -	\$ -	\$ -	\$ -
Computer & Software CapEx	-	-	-	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	262,244	(4,094)	(266,338)	72,330	(189,914)
Inc(Dec) in Fixed Assets (B)	\$ 262,244	\$ (4,094)	\$ (266,338)	\$ 72,330	\$ (189,914)
TOTAL BUDGET (=A+B)	\$ 7,858,599	\$ 8,448,465	\$ 589,866	\$ 8,904,105	\$ 1,045,506
FTEs	15.51	17.16	1.65	19.27	3.76

Compliance Analysis, Organization Registration and Certification

Compliance Analysis, Organization Registration and Certification (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	7.52	9.40	1.88
Direct Expenses	\$ 1,686,689	\$ 2,148,762	\$ 462,073
Indirect Expenses	1,832,451	2,103,037	270,586
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	127,149	635,283	508,134
TOTAL BUDGET	\$ 3,646,289	\$ 4,887,082	\$ 1,240,793

Background and Scope

The Compliance Analysis, Registration and Certification group is responsible for a range of requirements and activities embodied in Section 500 (Organization Registration and Certification) and Appendices 5A and 5B of the NERC ROP. The group provides technical resource support to standards development, compliance monitoring, and enforcement and (1) ensures that all entities impacting the BES are registered commensurate with risk, (2) ensures that all Reliability Coordinators (RCs), Transmission Operators (TOPs), and Balancing Authorities (BAs) are certified, (3) conducts industry reliability assurance activities, and (4) ensures that compliance gaps identified in reportable events are assessed and addressed if appropriate. Specific activities of the group include:

- **Registration** – Identifies and registers BES users, owners, and operators who are responsible for compliance with reliability standards. Organizations that are registered are included on the NERC Compliance Registry (NCR) and are responsible for knowing the content of and complying with all applicable reliability standards. Maintains the current registration for the entire ERO for entities as they take on and drop functional responsibilities.
- **Certification** – Evaluates and certifies the competency of reliability entities (i.e., those that perform certain key reliability functions, specifically the RC, BA, and TOP functions). Entities performing these three functions must be evaluated for having the necessary personnel, knowledge, facilities, programs, and other qualifications to carry out these important responsibilities, including demonstrating the ability to meet the requirements and sub-requirements of all of the reliability standards applicable to the reliability function(s). This also includes confirming through the certification review process that a reliability entity continues to have the qualifications mentioned above following planned material changes to that entity's operation.
- **Reliability Assurance** – Conducts reliability assurance activities, including:
 - **Reliability Assurance** – Conducts activities to reasonably assure the ERO that certain actions have been taken as reported in response to NERC Alerts or guidance to industry.
 - **Oversight** – Provides oversight of Regional Entity implementation of regional registration, compliance, certification, investigation, complaint programs, and processes.
 - **Investigations** – Conducts non-public, confidential investigations to identify Possible Violations of NERC reliability standards in response to complaints, BES disturbances, or other similar triggers. The Compliance Analysis, Certification and Registration staff participates on all Regional Entity-led investigations and as observers as requested on FERC-led reliability investigations and inquiries.

- **Compliance evaluations** – Works closely with regional staff to confirm that qualified events and disturbances are evaluated against the relevant approved reliability standards and ensure formal compliance monitoring occurs if indicated. These analyses are also shared with FERC staff.
- **Complaints** – Addresses formal complaints that allege the violation of reliability standards, through a confidential process.

Key Efforts Underway

In 2016, NERC registration conducted a program review to identify areas for improvements. These areas included:

- Conducting NERC-led Review Panels and identifying process improvements;
- NERC ROP changes;
- Coordinating Functional Registration research on process and model efficiencies;
- Supporting the entity registration xRM database initiative;
- Doing a thorough review of the NERC website for any modifications;
- Reviewing internal processes and procedures; and
- Continuing Regional Entity oversight activities.

NERC Reliability Assurance, in conjunction with Regional Entities, performed a review of the Certification program in 2016 regarding its effectiveness in determining an entity's ability to become certified and then operational, and to begin to incorporate changes to the program, if applicable, based on the outcomes of the review. The team concluded that the certification process is necessary and is effective in determining an entity's ability to become certified and operational. The team recommended two improvements to the existing certification process which will be acted on in 2017.

- Clearly establish the focus on certification on evaluation of an entity's capability to perform the reliability function of transmission operator, balancing authority, and/or reliability coordinator through the use of standard templates to be used by each Regional Entity's certification team.
- Conduct an evaluation of the certification review process to determine effectiveness of the current triggers of the certification review and execution of the actual process, and implement any needed ROP changes.
- Continue Regional Entity oversight activities.

2018 Goals and Deliverables

The Compliance Analysis, Certification and Registration group has several goals and deliverables that support the *2017-2020 ERO Enterprise Strategic Plan and Metrics*. Resources will be focused on building upon the improvements identified in 2017. Specific 2018 objectives for this group are:

- Continue to conduct NERC-led Review Panels on registration requests.
- Continue to implement registration program improvements identified in the 2016 project and conduct any additional actions identified by the project.
- Implement certification program improvements identified in the 2016 project and conduct training as necessary.
- Evaluate BES disturbances and events for potential gaps in compliance monitoring or reliability standards.

Resource Requirements

Personnel

The 1.88 increase in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Contractor Expenses

No contractor and consulting support is budgeted in 2018, which is consistent with the 2017 budget.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
COMPLIANCE ANALYSIS, ORGANIZATION REGISTRATION and CERTIFICATION					
	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 3,576,122	\$ 3,576,122	\$ 0	\$ 4,837,109	\$ 1,260,987
Assessment Stabilization Reserve - Penalties	69,980	69,980	(0)	43,478	(26,502)
Total NERC Funding	\$ 3,646,102	\$ 3,646,102	\$ 0	\$ 4,880,587	\$ 1,234,485
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	187	8,386	8,199	6,495	6,308
Miscellaneous	-	-	-	-	-
Total Funding	\$ 3,646,289	\$ 3,654,488	\$ 8,199	\$ 4,887,082	\$ 1,240,793
Expenses					
Personnel Expenses					
Salaries	\$ 1,125,154	\$ 1,477,441	\$ 352,287	\$ 1,514,712	\$ 389,558
Payroll Taxes	76,383	91,610	15,227	95,616	19,233
Benefits	174,014	191,939	17,925	194,709	20,695
Retirement Costs	126,651	158,431	31,780	168,791	42,139
Total Personnel Expenses	\$ 1,502,203	\$ 1,919,422	\$ 417,219	\$ 1,973,828	\$ 471,626
Meeting Expenses					
Meetings	\$ 4,000	\$ 8,000	\$ 4,000	\$ 2,250	\$ (1,750)
Travel	155,146	180,000	24,854	150,500	(4,646)
Conference Calls	610	2,527	1,917	-	(610)
Total Meeting Expenses	\$ 159,756	\$ 190,527	\$ 30,771	\$ 152,750	\$ (7,006)
Operating Expenses					
Consultants & Contracts	\$ -	\$ -	\$ -	\$ -	\$ -
Office Rent	-	-	-	-	-
Office Costs	24,231	19,461	(4,771)	21,684	(2,547)
Professional Services	-	-	-	-	-
Miscellaneous	500	250	(250)	500	-
Depreciation	-	-	-	-	-
Total Operating Expenses	\$ 24,731	\$ 19,711	\$ (5,021)	\$ 22,184	\$ (2,547)
Total Direct Expenses	\$ 1,686,689	\$ 2,129,659	\$ 442,969	\$ 2,148,762	\$ 462,073
Indirect Expenses	\$ 1,832,451	\$ 2,272,743	\$ 440,292	\$ 2,103,037	\$ 270,586
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 3,519,141	\$ 4,402,402	\$ 883,261	\$ 4,251,799	\$ 732,659
Change in Assets	\$ 127,149	\$ (747,914)	\$ (875,063)	\$ 635,283	\$ 508,134
Fixed Assets					
Depreciation	\$ -	\$ -	\$ -	\$ -	\$ -
Computer & Software CapEx	-	501,800	501,800	600,000	600,000
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	127,149	(2,164)	(129,313)	35,283	(91,866)
Inc(Dec) in Fixed Assets (B)	\$ 127,149	\$ 499,636	\$ 372,487	\$ 635,283	\$ 508,134
TOTAL BUDGET (=A+B)	\$ 3,646,289	\$ 4,902,038	\$ 1,255,749	\$ 4,887,082	\$ 1,240,793
FTEs	7.52	9.07	1.55	9.40	1.88

Compliance Enforcement

Compliance Enforcement (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	13.16	12.22	(0.94)
Direct Expenses	\$ 2,371,347	\$ 2,451,137	\$ 79,790
Indirect Expenses	3,206,790	2,733,948	(472,842)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	222,510	1,488,854	1,266,344
TOTAL BUDGET	\$ 5,800,647	\$ 6,673,939	\$ 873,292

Background and Scope

The Compliance Enforcement department is responsible for overseeing enforcement processes, the application of Penalties or sanctions, and activities to mitigate and prevent recurrence of noncompliance with reliability standards. The Compliance Enforcement department works collaboratively with the eight Regional Entities to ensure consistent and effective implementation of the risk-based Compliance Monitoring and Enforcement Program. Importantly, the department also focuses on ensuring that the ERO Enterprise dedicates resources to the matters that pose the greatest risk to reliability.

The NERC Compliance Enforcement department performs its responsibilities by:

- Monitoring Regional Entities' enforcement processes and providing oversight over their outcomes to ensure due process, to identify best practices and process efficiency opportunities, and to promote consistency among Regional Entities' business practices;
- Collecting and analyzing compliance enforcement data and trends to assist with the identification of emerging risks and to help inform the development of enforcement policies and processes;
- Filing notices of Penalty and other submittals associated with noncompliance discovered through Regional Entity compliance monitoring and enforcement activities;
- Processing and filing notices of Penalty and other submittals associated with violations discovered through NERC-led investigations and audits;
- Collaborating with other NERC departments, including Compliance Assurance, Standards, Event Analysis, and Regional Entity Coordination; and
- Delivering training of the ERO Enterprise staff and registered entities, as well as supporting other outreach efforts.

The ERO Enterprise's enforcement jurisdiction is drawn from the Energy Policy Act of 2005 (the Act), which added Section 215 to the Federal Power Act (FPA). Section 215 made compliance with electric reliability standards mandatory and authorized the creation of an ERO and Regional Entities to establish and enforce reliability standards. Under section 215(e)(1) of the FPA, NERC or a Regional Entity may impose a Penalty on a user, owner, or operator of the BPS for a violation of a Reliability Standard approved by FERC. As the ERO, NERC has set forth Sanction Guidelines in its ROP that govern the ERO Enterprise's determinations of Penalties and non-monetary sanctions for Reliability Standard violations. The Sanction Guidelines provide information on the factors that affect penalty determinations and the behaviors, e.g., self-reporting, timely mitigation, and cooperation, that the ERO Enterprise seeks to encourage to promote compliance and reliable operations.

ERO Enterprise Core Values and Guiding Principles

The ERO Enterprise’s 2017-2020 Strategic Plan promotes the ERO Enterprise’s core values and guiding principles. A goal of the ERO Enterprise is to be “a strong enforcement authority that is objective, fair, and promotes a culture of reliability excellence through risk-informed compliance monitoring, enforcement, certification, and registration.”

The following principles serve as guidelines for the conduct and behavior of all involved in the ERO Enterprise enforcement program to ensure alignment with this goal and with the ERO Enterprise’s core values.

Compliance Enforcement Authorities are independent, without conflict of interest, objective, and fair.

The ERO Enterprise strives to be a strong enforcement authority that is independent, without conflict of interest, objective, and fair. NERC and each of the Regional Entities has a code of conduct addressing the professional and ethical standards applicable to its personnel. Foremost among these standards is the requirement that no person work on a matter where that work may affect the person’s financial interest. The ERO Enterprise also expects its personnel to conduct themselves professionally and respectfully when engaging with registered entities or other stakeholders. Personnel who do not meet these standards are subject to discipline, up to and including termination.

Enforcement program promotes culture of reliability excellence through a risk-based approach.

The ERO Enterprise’s risk-based enforcement philosophy generally advocates reserving enforcement actions under section 5.0 of the Compliance Monitoring and Enforcement Program for those issues that pose a higher risk to the reliability of the BPS. The risk of a noncompliance is determined based on specific facts and circumstances, including any controls in place at the time of the noncompliance. The ERO Enterprise works with registered entities to ensure timely remediation of potential risks to the reliability of the BPS and prevent recurrence of noncompliance. The enforcement process allows parties to address risks collaboratively and promote increased compliance and reliability through improvement of programs and controls at the registered entities.

The ERO Enterprise applies a presumption of non-enforcement treatment of minimal risk noncompliance to entities with demonstrated internal controls who are permitted to self-log such minimal risk issues. Regarding other issues posing a minimal risk, NERC and the Regional Entities may exercise appropriate judgment whether to initiate a formal enforcement action or resolve the issue outside of the formal enforcement processes. The availability of streamlined treatment of minimal risk noncompliance outside of the formal enforcement process encourages self-inspection by registered entities. When self-identified minimal risk noncompliance is more than likely not going to be subject to a financial Penalty, registered entities are encouraged to establish more robust internal controls for the detection and correction of noncompliance. This approach allows the ERO Enterprise to oversee the activities of registered entities in a more efficient manner and to focus resources where they result in the greatest benefit to reliability. In this context, efficiency does not necessarily mean less time or effort. Rather, it is using the requisite time, knowledge, and skills required for each circumstance. In addition, this approach allows the ERO Enterprise to continue to provide clear signals to registered entities about identified areas of concern and risk prioritization, while maintaining existing visibility into potential noncompliance and emerging areas of risk. Outcomes for noncompliance are based on the risk of a specific noncompliance and may range from streamlined, non-enforcement processes, to significant monetary Penalties.

Enforcement actions are used and Penalties are imposed when warranted, commensurate with risk.

An element of a risk-based approach to enforcement is accountability of registered entities for their noncompliance. No matter the risk of the noncompliance, the registered entity still bears the responsibility of mitigating that noncompliance. Based on the risk, facts, and circumstances associated

with that noncompliance, the Regional Entity decides on an appropriate disposition track, inside or outside of an enforcement action, as described above, and whether a Penalty is appropriate for the noncompliance.

Penalties are generally warranted for serious risk violations (e.g., uncontrolled loss of load, CIP program failures) and for when repeated noncompliance constitutes an aggravating factor. In addition to the use of significant Penalties to deter undesired behavior, the ERO Enterprise also incents desired behaviors.¹⁷ Specifically, Regional Entities may offset Penalties to encourage valued behavior. Factors that may mitigate Penalty amounts include registered entity cooperation, accountability (including admission of violations), culture of compliance, and self-identification of noncompliance.

Regional Entities may also grant credit in enforcement determinations for certain actions undertaken by registered entities for improvements in addition to mitigating factors. For example, Regional Entities may consider significant investments in reliability made by registered entities, beyond those otherwise planned and required, as an offset for proposed Penalties in enforcement determinations. Regional Entities do not award credits or offsets for actions or investments undertaken by a registered entity that are required to mitigate noncompliance.

NERC engages in regular oversight of Regional Entity enforcement activities to confirm that the Regional Entities have followed the CMEP. This oversight evaluates the consistency of disposition methods, including assessment of a Penalty or sanction, with previous resolutions of similar noncompliance involving similar circumstances. The NERC Board Compliance Committee (the Compliance Committee) considers the recommendations of NERC staff regarding approval of Full Notices of Penalty (NOP) and monitors the handling of noncompliance through the streamlined disposition methods of Spreadsheet NOPs, FFTs, and Compliance Exceptions (CE).

Actions are timely and transparent.

NERC's ROP (including the CMEP and Sanction Guidelines) and program documents are available to the public.¹⁸ NERC also posts information on enforcement actions on a monthly basis.¹⁹ Moreover, information on the efficiency of the enforcement program is available to regulators, industry stakeholders, and the public on a quarterly basis.²⁰

Noncompliance information is used as an input to other processes.

When developing risk elements, NERC annually identifies and prioritizes risks to the reliability of the BPS, taking into account factors such as compliance findings, event analysis experiences, and data analysis. In addition, Regional Entities consider factors such as noncompliance information when conducting an IRA of a registered entity. The ERO Enterprise also uses noncompliance information as part of a feedback loop to the standards development process. This allows enhanced reliability standards through appropriate information flows from compliance monitoring and enforcement to the standards drafting process and other NERC programs. NERC regularly provides analysis and lessons learned from noncompliance information to industry stakeholders and the public.²¹

¹⁷ As required by §215(e)(6) of the Federal Power Act and the Commission's regulations at 18 C.F.R. §39.7(g), the Sanction Guidelines, Appendix 4B to the NERC Rules of Procedure, provide that Penalties and sanctions imposed for the violation of a Reliability Standard shall bear a reasonable relation to the seriousness of the violation while also reflecting consideration of the other factors specified in the Sanction Guidelines. The [Sanction Guidelines](#) are available on NERC's website.

¹⁸ [NERC Rules of Procedure](#)

¹⁹ [Posted compliance exceptions, Spreadsheet Notices of Penalty, and Full Notices of Penalty](#)

²⁰ The Compliance Monitoring and Enforcement Program Reports can be found in the Compliance Committee meeting agenda packages on the [Board of Trustees Compliance Committee website](#).

²¹ Id.

Stakeholder Engagement and Benefit

Over the past few years, NERC and the Regional Entities have made substantial progress in reducing the number of instances of noncompliance remaining to be evaluated and processed. The ERO Enterprise has held registered entities accountable for instances of noncompliance that posed a risk to the reliability of the BPS while ensuring that enforcement actions are timely and transparent. NERC promotes a culture of reliability excellence by examining registered entities' internal compliance programs and considering them as mitigating factors in Penalty determinations.

Processing Efficiencies

In an effort to improve the efficiency of enforcement processing throughout the ERO Enterprise, NERC developed a series of key enforcement processing metrics, which are tracked and analyzed throughout the year.

Enforcement's 2016 goal to have more than 70 percent of issues of noncompliance be self-identified was met in 2016.²² The self-assessment and identification of noncompliance metric is used to compare the number of noncompliance discovered internally versus externally to promote self-assessment and internal identification of noncompliance. For self-identification of noncompliance in 2016, the threshold is 70 percent and the target is 75 percent. Enforcement met the threshold and target for this goal, closing the year at an 87 percent self-identification rate.

The ERO Enterprise has continued to promote timely mitigation of noncompliance with over 99 percent of noncompliance discovered before 2013 having completed Mitigation Plans or mitigating activities, reducing risk to the BPS. The ERO Enterprise successfully met its mitigation targets for noncompliance discovered in 2014 and 2015 by ensuring at least 90 percent of noncompliance discovered in 2014 and 75 percent of noncompliance discovered in 2015 have been mitigated. Significantly, these target goals were both exceeded, with almost 99 percent of 2014 noncompliance and 90 percent of 2015 noncompliance being mitigated. Enforcement also met its goal of having 100 percent of NOPs approved by FERC.

The ongoing use of CEs throughout the ERO Enterprise, combined with the influx of noncompliance discovered in the second half of 2016, has contributed to the average age of noncompliance in Q4 2016 dropping to less than 8 months. The average age has not been this low since 2013. Typically, noncompliance has a relatively consistent average age in the ERO Enterprise inventory of approximately 10 to 11 months. Further, eighty-one percent of the ERO Enterprise noncompliance inventory is less than one year old, and only seven percent is over two years old.

Finally, at the beginning of 2016, there were 368 federal entity violations that were on hold pending the result of a case before the DC Circuit Court of Appeals. Federal violations have been prioritized in 2016, and there are only 17 still needing to be processed, less than five percent of the initial total.

Continued Outreach Efforts in 2017 and Beyond

In 2017, NERC and the Regional Entities will continue to conduct outreach activities that focus on self-logging, compliance exceptions, and risk assessment of noncompliance. NERC plans to use existing industry events, such as the Standards and Compliance workshops and industry webinars, to provide information on compliance enforcement activities.

NERC Oversight of Risk-Based CMEP Implementation

For 2017, ensuring the successful implementation of NERC's risk-based CMEP remains the priority of Compliance Enforcement's oversight plan. As part of that oversight and in addition to offering regular

²²Self-identification includes noncompliance discovered through Self-Reports, Self-Certifications, and Periodic Data Reporting.

feedback to the Regional Entities, NERC will continue to identify areas for improvement or promoting consistency through training, guidance, or adjustment the following year. NERC also produces an ERO Enterprise CMEP annual report, which includes an assessment of the risk-based CMEP implementation. NERC expects to publish that report during Q1 2018.

NERC performs oversight of the Regional Entities' enforcement programs primarily through the review of the processes, supporting evidence, and other information provided by the Regional Entities over the course of focused engagements of program areas that are scheduled throughout the year. NERC communicates the recommendations and findings to the Regional Entities to help the ERO Enterprise develop responsive strategies and solutions to potential issues and ensure uniform and consistent implementation of the CMEP. Such recommendations and findings also help identify priority areas for training of ERO Enterprise staff during the year.

Other Key Enforcement Efforts Underway

Regional Entity Training

NERC Enforcement will provide training to Regional Entity staff on the most important elements of risk-based enforcement, including risk assessment of noncompliance and the determination of appropriate penalties and sanctions for noncompliance. NERC is developing this training based on observations from its oversight activities of Regional Entity settlement agreements, as well as the process reviews described above.

2018 Goals and Deliverables

Specific 2018 objectives for the Compliance Enforcement department include:

- Continuing to refine and improve the risk-based CMEP processes;
- Continuing to implement in a transparent manner an ERO Enterprise enforcement philosophy that is risk-focused and drives desired behaviors by registered entities;
- Expanding the feedback loop of information from Enforcement to Standards and other program areas; and
- Working closely with NERC's Compliance Assurance and Information Technology departments, as well as staff in the Regional Entities, regarding the evaluation of improvements in the existing compliance, reporting, analysis tracking system, and other compliance tools to support risk-based activities.

Resource Requirements

Personnel

The 0.94 reduction in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Contractor Expenses

No contractor and consultant expenses are budgeted in Compliance Enforcement in 2018, which is consistent with 2017. However, the IT budget includes funding for the maintenance, evaluation, and development of enterprise tools supporting technical feasibility exceptions, registration, and enforcement activities.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
COMPLIANCE ENFORCEMENT					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 5,677,854	\$ 5,677,854	\$ (0)	\$ 6,608,973	\$ 931,119
Assessment Stabilization Reserve - Penalties	122,465	122,465	0	56,522	(65,943)
Total NERC Funding	\$ 5,800,319	\$ 5,800,319	\$ (0)	\$ 6,665,495	\$ 865,175
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	327	11,966	11,639	8,444	8,117
Miscellaneous	-	-	-	-	-
Total Funding	\$ 5,800,647	\$ 5,812,286	\$ 11,639	\$ 6,673,939	\$ 873,292
Expenses					
Personnel Expenses					
Salaries	\$ 1,790,859	\$ 1,799,026	\$ 8,166	\$ 1,792,112	\$ 1,252
Payroll Taxes	117,205	113,789	(3,417)	115,916	(1,290)
Benefits	184,106	185,301	1,195	168,533	(15,573)
Retirement Costs	198,694	193,748	(4,946)	200,403	1,708
Total Personnel Expenses	\$ 2,290,865	\$ 2,291,863	\$ 998	\$ 2,276,963	\$ (13,902)
Meeting Expenses					
Meetings	\$ 2,500	\$ 1,250	\$ (1,250)	\$ 2,000	\$ (500)
Travel	56,736	55,000	(1,736)	47,500	(9,236)
Conference Calls	366	4,042	3,676	-	(366)
Total Meeting Expenses	\$ 59,602	\$ 60,292	\$ 690	\$ 49,500	\$ (10,102)
Operating Expenses					
Consultants & Contracts	\$ -	\$ -	\$ -	\$ -	\$ -
Office Rent	-	-	-	-	-
Office Costs	20,379	18,835	(1,544)	19,160	(1,220)
Professional Services	-	-	-	-	-
Miscellaneous	500	750	250	500	-
Depreciation	-	105,014	105,014	105,014	105,014
Total Operating Expenses	\$ 20,879	\$ 124,600	\$ 103,720	\$ 124,674	\$ 103,794
Total Direct Expenses	\$ 2,371,347	\$ 2,476,755	\$ 105,408	\$ 2,451,137	\$ 79,790
Indirect Expenses	\$ 3,206,790	\$ 3,194,871	\$ (11,919)	\$ 2,733,948	\$ (472,842)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 5,578,137	\$ 5,671,626	\$ 93,489	\$ 5,185,085	\$ (393,052)
Change in Assets	\$ 222,510	\$ 140,660	\$ (81,850)	\$ 1,488,854	\$ 1,266,344
Fixed Assets					
Depreciation	\$ -	\$ (105,014)	\$ (105,014)	\$ (105,014)	\$ (105,014)
Computer & Software CapEx	-	-	-	1,548,000	1,548,000
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	222,510	(3,042)	(225,552)	45,868	(176,642)
Inc(Dec) in Fixed Assets (B)	\$ 222,510	\$ (108,056)	\$ (330,566)	\$ 1,488,854	\$ 1,266,344
TOTAL BUDGET (=A+B)	\$ 5,800,647	\$ 5,563,570	\$ (237,077)	\$ 6,673,939	\$ 873,292
FTEs	13.16	12.75	(0.41)	12.22	(0.94)

Reliability Assessment and System Analysis

Reliability Assessment and System Analysis (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	14.10	14.10	-
Direct Expenses	\$ 3,986,965	\$ 4,256,247	\$ 269,282
Indirect Expenses	3,435,846	3,154,555	(281,291)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	112,782	(97,847)	(210,629)
TOTAL BUDGET	\$ 7,535,594	\$ 7,312,956	\$ (222,638)

Background and Scope

The Reliability Assessment and System Analysis (RASA) department carries out the ERO's statutory responsibility to conduct assessments of the reliability and adequacy of the BES. These assessments are used to provide insight and guidance about reliability risks. These insights provide a foundation for the development of new reliability standards or modifications to mandatory reliability standards, or other initiatives, such as guidelines, alert(s), webinars, etc., all focused on enhancing overall reliability. The majority of the activities in the RASA department directly address the risk priorities established by the RISC. In particular, the risks pertaining to changing resources and planning noted in the 2016 RISC report are of particular importance to the assessment and analysis work being performed in RASA.

NERC staff works closely with stakeholders on creating assessment development schedules, including schedules with adequate stakeholder review at every level. All NERC reliability assessments have a sponsoring technical committee, subcommittee, or other subgroup. The Long-Term and Seasonal assessments are conducted by the Reliability Assessment Subcommittee, and ultimately endorsed by the Planning Committee. Special Assessments often require a separate and specialized task force or advisory group to help construct, conduct, and produce special topic assessments such as the Clean Power Plan assessments, Natural Gas interdependency assessment, and distributed energy report.

The department focuses on developing a technical framework and understanding the emerging reliability risks facing the industry. It also provides guidance and insights to stakeholders across North America. The department relies on its own engineering and analysis expertise, as well as Regional Entity and stakeholder resources. RASA is responsible for:

- Independent reliability assessments on the overall reliability and adequacy of the BES and associated emerging reliability risks that could impact the short-, mid- and the long-term (e.g., 10-year) planning horizons, and other reliability issues requiring an in-depth analysis.
- Support for the development and improvement of long-term sustainable interconnection-based power flow, dynamic, and load models that exhibit the accuracy and fidelity reflecting actual BES reliability performance and dynamic conditions.
- Interconnection-wide analysis of steady-state and dynamic conditions, including frequency, Essential Reliability Services, stability, short circuit ratio, and oscillatory behavior aspects.
- Advancement of industry and the ERO's understanding of power system characteristics and behaviors by gathering larger Phasor Measurement Unit (PMU) datasets for advanced data analytics and modeling improvements.

- Assurance oversight that the BES electrical elements necessary for its reliable operation are identified, requiring the elements to follow the appropriate NERC Reliability Standards.
- Establishment of reliability leadership and consistent, technically sound guidance and recommendations that position industry and policy makers to enhance reliability through effective outreach and communications.

Stakeholder Engagement and Benefit

RASA works with industry leaders to create a reliability strategy that is relevant, timely, and effective to address the most important reliability risks. This effort includes reviewing and addressing key priority risks identified by NERC's RISC; synthesizing key information identified through analysis and assessment efforts; extracting and prioritizing the associated reliability risks; sharing and integrating risk analysis insights across the ERO Enterprise; and translating that knowledge into actionable guidance and recommendations for NERC management, the Board, and entities, along with state, federal, and provincial policy makers.

In addition, the ERO monitors the ongoing and historic reliability performance of the BES through data gathered to analyze historic trends. The ERO provides reports and recommendations regarding the anticipated conditions that could impact the reliability, security, and stability of the BPS to the industry, Regional Entities, regulatory entities, and other designated entities.

2018 Enhancements

Enhancements in the 2018 BP&B are a reflection of the strategic goals and objectives identified in the *ERO Enterprise Strategic Plan and Metrics 2017–2020*.

The following enhancements are attributable to Strategic Goal 1 and the objectives and valued outcomes noted within Strategic Goal 1:

- Interconnection-wide analysis of steady-state and dynamic conditions, including frequency, Essential Reliability Services, stability, Short Circuit Ratio and oscillatory behavior aspects.
- Perform model validations at the interconnection level and compare with internal transmission owner models. (Short circuit model validation)

The following enhancements are attributable to Strategic Goal 4 and the objectives and valued outcomes noted within Strategic Goal 4:

- Improve resource adequacy assessments with increased probabilistic and risk analysis;
- Conduct interconnection-wide analysis to support NERC's reliability assessments and improve industry planning;
- Increase technical analysis and assessment focus on natural gas, wind, and solar resource and fuel availability;
- Develop technical references and guidelines that advance and improve reliability using new technologies; and
- Develop quality/fidelity assessments of interconnection models.

The following enhancement is attributable to Strategic Goal 5 and the objectives and valued outcomes noted within Strategic Goal 5:

- Enhance and implement documented oversight plans for Regional Entity delegated functions.

Key RASA Efforts Underway

RASA focuses its efforts in the following key areas:

Reliability Assessment

Reliability assessments serve to evaluate the expected reliability of the BES through extensive deterministic and probabilistic analyses to identify potential reliability risks and potential mitigation approaches. These reviews include both evaluations at the edge of the planning horizon, as well as assessments of the anticipated performance during the short-term (12- to 18-month outlook). These analyses involved planned and anticipated changes to generation resources, transmission infrastructure, and load behavior compared to base-line needs of the system to remain reliable and formulate recommendations and related guidance. This assessment is often completed by examining special scenarios and unique situations within the BES. These analyses provide a technical platform for important policy discussions on challenges facing the interconnected BES, as well as focused recommendations on mitigation to improve overall reliability or lessen reliability risks.

By identifying and quantifying emerging reliability issues, NERC is able to provide risk-informed recommendations and support a learning environment for industry to address emerging risks and pursue improved reliability performance. These efforts are expected to expand to assess the impacts on reliability from the changing resource mix, reliability behavior of resources, distributed energy resources, and loads. Many resource additions are asynchronous and energy-limited, requiring assessment of a substantial number of scenarios rather than just seasonal peak conditions. Reliability assessments must therefore include a greater focus on probabilistic approaches, assessing the sufficiency of essential reliability services as well as focusing seasonal assessments on short-term horizons to encompass more than peak condition reserve margin analyses.

Key assessments include:

- Long-Term Reliability Assessment (supplemented by the Probabilistic Assessment)
- Summer and Winter Reliability Assessments (condensed report)
- Short-Term and Special Reliability Assessments
 - a. Between one and four short-term reliability assessments are expected, driven by the need to assess emerging short-term risks to reliability
 - b. Special Assessments are selected based on high-priority/high-risk issues that require an independent assessment from the ERO.

A significant ongoing effort anticipated to involve RASA, Regional Entity staff, and stakeholders focuses on the continued development of effective Essential Reliability Services. These efforts are expected to lead to a broad set of recommendations that will culminate with defined elements, an evaluation of initial metrics and data compilation of actual performance, and refinement about the ongoing assessment of Essential Reliability Services measures.

System Analysis

Understanding the technical behavior of the North American grid is the foundation for identifying crucial aspects of performance that are important for sustaining overall reliability. NERC's understanding of grid

behavior is achieved through a comprehensive evaluation of system behavior through constant observation and study, analytic simulations, and forensic analysis of system disturbances. Methodically comparing the simulation results of powerflow and system dynamic performance to actual system behavior improves models critical for industry use to simulate system conditions as well as enables RASA to gain insights to enhance predictive system analysis.

The ERO Enterprise RASA team also supports the following objectives:

- Continue leading and improving NERC’s analytical capabilities to address a broad range of engineering topics,
- Support NERC Reliability Standards development with subject matter expertise,
- Support and lead technical analysis of emerging risks requiring advanced analytics and interconnection-wide assessment,
- Detailed forensic analysis of significant system disturbances

Key focus areas:

- PMU Measurement, use, and analysis improvements
 - Synchrophasor technology
 - Power plant model verification
 - Oscillation analysis
- Frequency Response Analysis, Interconnection Frequency Response Obligation Analysis, and forward-looking reliability assessment
- Interconnection-Wide system inertia study
- Interconnection-Wide short circuit ratio assessment
- Interconnection-Wide Model Building Designation and Criteria administration
- Interconnection-Wide model validation
- Improving model quality and fidelity
- Analysis of TPL Footnote 12
- Load and distributed energy resource modeling
- Event analysis – simulation and forensic analysis of major events
- Reliability Standards support
- BES Exception and Self-Determined Notification Processing

Further, RASA will continue to work closely with other organizations, including but not limited to the Electric Power Research Institute (EPRI), the Department of Energy (DOE), the Institute of Electrical and Electronic Engineers (IEEE), the Institute of Nuclear Power Operations (INPO), the North American Transmission Forum (NATF), the North American Generation Forum (NAGF), and the Canadian Electricity Association (CEA). RASA collaborates with these groups on a number of fronts, including geomagnetic disturbance (GMD), vegetation management, and variable generation integration. RASA will continue working with the Interstate Natural Gas Association of America (INGAA) and the Natural Gas Supply Association (NGSA) regarding studies pertaining to the interdependency of gas and electric systems.

2018 Goals and Deliverables

In 2018, RASA will seek to achieve several specific goals and objectives as part of the strategic focus of the ERO Enterprise (Strategic Goals 1, 4, and 5):

- Pioneer implementation of advanced reliability assessment and system analysis methods to address the changing nature of the grid. Issue reliability assessment reports, guidelines, and recommendations to address high priority evolving performance trends and address emerging risks to reliability.
 - Expand the use of probabilistic assessment tools across the ERO and gain consistency in approach
 - Special assessments on identified high-priority risks (from RISC prioritization and recommendations)²³
 - Changing resource mix and maintaining Essential Reliability Services
 - Increased penetration of Distributed Energy Resources
 - Increasing dependency on generation fueled by natural gas
 - Broaden understanding of inter-area and local system oscillations in all interconnections and their potential impact on interconnection reliability.
 - As part of its oversight of the Regional Entities, build and sustain an Enterprise RAPA team (ERO-RAPA) that encompasses the consistent development and implementation of risk-informed approaches and structured methods to identify and address reliability risks.
- Develop technical analyses in key reliability areas, resulting in technically accurate and comprehensive reports addressing areas of concern (e.g., Frequency Response, Short Circuit Strength, Inter-area Oscillation, Distributed Energy Resource (DER) and etc.). The purpose of these technical analyses are to understand and evaluate the Bulk Power System (BPS) characteristics, behavior and performance due to the changing resource mix and integration of new technology. It is also intended to provide oversight, guidance, direction, and technical expertise to address key planning related issues and interconnection-wide concerns.
- Provide technical expertise, research and feedback to the industry. Provide foundational technical efforts that support the key reliability planning-related standards development. In addition to providing feedback, NERC will also solicit industry's help by utilizing resources and leveraging any research that has been done by the industry.
- Continue to explore the use of state of the art software to conduct power system analysis. Enhance the usage of real-time tools used by the industry to sharpen and fine tune our models as the system evolves with the integration of new technology.
- Support NERC Reliability Standard development by providing subject matter expertise.
- Provide support and leadership to (1) the Planning Committee and (2) standing committees' subcommittees, working groups, and task forces serving the standing committees. Support the development of technical reference documents and Reliability Guidelines with support of the PC leadership and established in the annual PC work plan
- As necessary, support major event investigations, analyses, and reporting of findings, recommendations, and lessons learned to improve reliability.

²³ [RISC Recommendations to the NERC Board of Trustees](#)

- Provide feedback to interconnection-wide model-building groups on improvements to system model quality and fidelity.
- Assist in the development of approaches to registration and provide input to NERC staff in support of the development of CMEP risk elements, as well as support and lead the BES Definition Exception Process.

Resource Requirements

Personnel

No additional personnel were allocated to RASA in 2018.

Contractor Expenses

The total contractor and consultant expenses for the RASA department remain unchanged from 2017 to 2018 at \$525k. Consultant and contractor support is budgeted for assistance in the following areas: research on the reliability effects of GMD; increased use of probabilistic analysis, particularly in RASA's resource adequacy assessments; development, analysis and assessment of Essential Reliability Services and related measures; and analysis of reliability effects of environmental regulations. The components of the budgeted 2017 and 2018 expenses are listed in *Exhibit C – Contractor and Consulting Costs*.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
RELIABILITY ASSESSMENT and SYSTEM ANALYSIS					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 7,339,030	\$ 7,339,030	\$ (0)	\$ 7,212,995	\$ (126,035)
Assessment Stabilization Reserve - Penalties	131,213	131,213	(0)	65,217	(65,995)
Total NERC Funding	\$ 7,470,243	\$ 7,470,243	\$ (0)	\$ 7,278,213	\$ (192,030)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	50,000	-	(50,000)	-	(50,000)
Workshops	15,000	15,000	-	25,000	10,000
Interest	351	11,034	10,683	9,743	9,392
Miscellaneous	-	-	-	-	-
Total Funding	\$ 7,535,594	\$ 7,496,277	\$ (39,317)	\$ 7,312,956	\$ (222,638)
Expenses					
Personnel Expenses					
Salaries	\$ 2,247,826	\$ 2,159,424	\$ (88,401)	\$ 2,334,967	\$ 87,141
Payroll Taxes	142,919	133,017	(9,902)	144,330	1,411
Benefits	263,230	254,714	(8,517)	283,513	20,283
Retirement Costs	246,609	236,358	(10,251)	258,277	11,668
Total Personnel Expenses	\$ 2,900,585	\$ 2,783,513	\$ (117,071)	\$ 3,021,087	\$ 120,502
Meeting Expenses					
Meetings	\$ 74,000	\$ 74,000	\$ 0	\$ 121,000	\$ 47,000
Travel	208,338	230,000	21,662	250,000	41,662
Conference Calls	5,270	7,365	2,094	-	(5,270)
Total Meeting Expenses	\$ 287,608	\$ 311,365	\$ 23,757	\$ 371,000	\$ 83,392
Operating Expenses					
Consultants & Contracts	\$ 525,000	\$ 438,025	\$ (86,975)	\$ 525,000	\$ -
Office Rent	-	-	-	-	-
Office Costs	147,652	131,200	(16,452)	187,889	40,238
Professional Services	-	-	-	-	-
Miscellaneous	500	250	(250)	500	-
Depreciation	125,621	151,409	25,788	150,771	25,150
Total Operating Expenses	\$ 798,773	\$ 720,884	\$ (77,888)	\$ 864,160	\$ 65,387
Total Direct Expenses	\$ 3,986,965	\$ 3,815,763	\$ (171,203)	\$ 4,256,247	\$ 269,282
Indirect Expenses	\$ 3,435,846	\$ 3,167,307	\$ (268,539)	\$ 3,154,555	\$ (281,291)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 7,422,812	\$ 6,983,070	\$ (439,742)	\$ 7,410,803	\$ (12,009)
Change in Assets	\$ 112,782	\$ 513,208	\$ 400,425	\$ (97,847)	\$ (210,629)
Fixed Assets					
Depreciation	\$ (125,621)	\$ (151,409)	\$ (25,788)	\$ (150,771)	\$ (25,150)
Computer & Software CapEx	-	31,145	31,145	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	238,403	(3,016)	(241,419)	52,924	(185,479)
Inc(Dec) in Fixed Assets (B)	\$ 112,782	\$ (123,280)	\$ (236,063)	\$ (97,847)	\$ (210,629)
TOTAL BUDGET (=A+B)	\$ 7,535,594	\$ 6,859,789	\$ (675,805)	\$ 7,312,956	\$ (222,638)
FTEs	14.10	12.64	(1.46)	14.10	-

Reliability Risk Management

NERC’s Reliability Risk Management (RRM) group carries out the ERO’s statutory responsibility to perform assessments (real time or near real time continual awareness, detailed analysis of significant events, and longer-term broad performance assessments) of the reliability and adequacy of the BES, including identifying potential issues of concern relating to system, equipment, entity, and human performance that may indicate the need to develop and implement targeted interventions. RRM has three departments: Situation Awareness (also referred to as Bulk Power System Awareness), Event Analysis, and Performance Analysis. These departments are responsible for six primary functions: (1) BES awareness, (2) event analysis and determination of root and contributing causes, (3) assessment of human performance challenges that affect BES reliability and identification of improvement opportunities, (4) continent-wide analysis and reporting of BES performance, (5) support of the NERC Operating Committee, and (6) support of the NERC CIPC.

RRM’s functions and resources are directly focused on proactive awareness of BES conditions and all events over a threshold of certain risk or impact. Through awareness and continuous assessment, RRM identifies potential reliability risks to the BES. RRM analyzes events in detail, addresses the most significant risks to BES reliability, and ensures that industry is well informed of system events, emerging trends, risk analysis, and lessons learned. Through performing these functions, RRM provides data and analysis to inform the other aspects of NERC’s statutory functions. The group also provides strategic direction for using risk-based concepts in planning and executing its responsibilities.

Situation Awareness

Situation Awareness (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	5.64	5.64	-
Direct Expenses	\$ 2,570,828	\$ 2,566,215	\$ (4,613)
Indirect Expenses	1,374,338	1,261,822	(112,516)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	87,695	18,610	(69,084)
TOTAL BUDGET	\$ 4,032,862	\$ 3,846,648	\$ (186,214)

Background and Scope

NERC’s Situation Awareness department and the eight Regional Entities monitor BES conditions, significant occurrences and emerging risks, and threats across the 14 Reliability Coordinator regions in North America to maintain an understanding of conditions and situations that could impact the bulk electric system’s reliable operation. This group also supports the development and publication of Alerts and awareness products and facilitates information sharing among industry, Regions, and the government during crisis situations and major system disturbances. The process for understanding the potential threats or vulnerabilities to the reliability of the BPS starts with understanding occurrences and events in the context in which they occur.

Stakeholder Engagement and Benefit

BES conditions continually change and provide recognizable signatures through automated tools, mandatory reports and voluntary information sharing, and third-party publicly available sources. The significant majority of these signatures represents conditions and occurrences that have little or no reliability impact, either positive or adverse, on the BES. However, being cognizant of the short-term

condition of the BES and the signatures associated with the entire range of reliability performance helps the ERO identify significant occurrences and events more accurately and efficiently. Registered entities continue to robustly share information and collaborate with the ERO in an effort to maintain and improve the overall reliability of the grid.

Key Efforts Underway

Several reliability-related situation awareness and monitoring tools will undergo enhancement, replacement, streamlining, or modification. The following tools are being focused on during 2016: (1) operation and maintenance of Situation Awareness for NERC, FERC, and Regions, Version 2 (SAFNRv2) software application used for monitoring, to include preparation for a new RFP process in late 2016 to enhance the tool from its current state with no changes to the data used; (2) operation and maintenance of the current secure NERC Alerts tool while planning for a streamlined NERC Alert process and platform appropriately integrated with related ongoing NERC, E-ISAC and ERO Enterprise IT initiatives; (3) refresh of the Reliability Coordinator Information System (RCIS) legacy application for operability and maintainability reasons, with no significant changes to functionality; and (4) continuing to set the conditions to bring limited streaming Synchrophasor data into NERC for wide-area situational awareness and event triage applications.

2018 Goals and Deliverables

In 2017, the Situation Awareness department will seek to accomplish the following specific goals and deliverables:

- Ensure that the ERO is aware of all BES events above a threshold of impact;
- Enable the sharing of information and data to facilitate wide-area situational awareness;
- During crisis situations, facilitate the exchange of information among industry, Regions, and the U.S. and Canadian governments;
- Keep industry informed of emerging reliability threats and risks to the BES, including any expected actions;
- Conduct the annual NERC Monitoring and Situational Awareness Conference and Human Performance Conference;
- Administer the NERC Alerts process as specified in ROP §810 to issue Advisory (Level 1) Alerts on significant and emerging reliability- and security-related topics as needed, and facilitate the tracking of actions specified in Recommendation (Level 2) and Essential Action (Level 3) Alerts; and
- Perform oversight, as per the Situation Awareness Oversight Plan, of the activities and performances of the Regional staffs.

The department uses the following major reliability-related tools to support department activities:

Resource Adequacy (ACE Frequency) Tool

This software application provides continuous monitoring of key resource adequacy performance metrics, including pre-established thresholds and limits defined in standards. It alerts Reliability Coordinators and resource subcommittees to conditions that could result in critical inadequacies, such as major tie errors, inaccurate load forecasts, and inadequate frequency response.

Inadvertent Interchange

This tool facilitates the entering of monthly scheduling data and submittal of monthly inadvertent performance standards reports to NERC. It also assists in the monitoring and resolution of reliability issues originated by inadvertent interchange imbalances.

Frequency Monitoring and Analysis Tool

This tool detects frequency events and captures key frequency response information for each interconnection.

Intelligent Alarms Tool

This tool detects short-term and long-term frequency deviations using data transmitted to NERC by the BAs. When coupled with the FNet²⁴ and Frequency Monitoring and Analysis tools, this tool allows immediate differentiation of the cause of a frequency deviation—a generator trip or a scheduling error.

Genscape

The PowerIQ and PowerRT tools provide more detailed insight into current-day conditions impacting BPS conditions in both normal operations and stressed conditions.

Resource Requirements

Personnel

There is no change in personnel from the 2017 to 2018 budget.

Contractor Expenses

The overall funding of approximately \$1.3M for contractors and consultants (which includes the cost of the tools set forth above) to support the department in 2018 is consistent with 2017. The components of the budgeted 2017 and 2018 expenses are listed in *Exhibit C – Contractor and Consulting Costs*.

²⁴ FNet – Operated by the Power Information Technology Laboratory at the University of Tennessee, FNet is a low-cost, quickly deployable global positioning system (GPS)-synchronized wide-area frequency measurement network. High dynamic accuracy Frequency Disturbance Recorders are used to measure the frequency, phase angle, and voltage of the power system at ordinary 120 V outlets. The measurement data are continuously transmitted via the Internet to the FNet servers hosted at the University of Tennessee and Virginia Tech.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
SITUATION AWARENESS					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 3,980,236	\$ 3,980,236	\$ (0)	\$ 3,816,664	\$ (163,572)
Assessment Stabilization Reserve - Penalties	52,485	52,485	(0)	26,087	(26,398)
Total NERC Funding	\$ 4,032,721	\$ 4,032,721	\$ (0)	\$ 3,842,751	\$ (189,971)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	140	5,331	5,191	3,897	3,757
Miscellaneous	-	-	-	-	-
Total Funding	\$ 4,032,862	\$ 4,038,052	\$ 5,191	\$ 3,846,648	\$ (186,214)
Expenses					
Personnel Expenses					
Salaries	\$ 873,869	\$ 810,775	\$ (63,094)	\$ 888,593	\$ 14,724
Payroll Taxes	58,749	54,308	(4,441)	59,143	394
Benefits	156,328	135,060	(21,269)	144,353	(11,976)
Retirement Costs	96,159	89,880	(6,278)	98,676	2,517
Total Personnel Expenses	\$ 1,185,105	\$ 1,090,024	\$ (95,081)	\$ 1,190,764	\$ 5,659
Meeting Expenses					
Meetings	\$ 6,500	\$ 6,500	\$ 0	\$ 2,000	\$ (4,500)
Travel	33,005	33,005	(0)	33,000	(5)
Conference Calls	305	1,868	1,563	-	(305)
Total Meeting Expenses	\$ 39,810	\$ 41,373	\$ 1,563	\$ 35,000	\$ (4,810)
Operating Expenses					
Consultants & Contracts	\$ 1,295,850	\$ 1,295,850	\$ 0	\$ 1,295,495	\$ (355)
Office Rent	-	-	-	-	-
Office Costs	41,897	40,056	(1,841)	41,897	(0)
Professional Services	-	-	-	-	-
Miscellaneous	500	100	(400)	500	-
Depreciation	7,667	8,948	1,282	2,559	(5,107)
Total Operating Expenses	\$ 1,345,914	\$ 1,344,955	\$ (959)	\$ 1,340,451	\$ (5,462)
Total Direct Expenses	\$ 2,570,828	\$ 2,476,351	\$ (94,477)	\$ 2,566,215	\$ (4,613)
Indirect Expenses	\$ 1,374,338	\$ 1,498,457	\$ 124,119	\$ 1,261,822	\$ (112,516)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 3,945,167	\$ 3,974,808	\$ 29,641	\$ 3,828,038	\$ (117,129)
Change in Assets	\$ 87,695	\$ 63,245	\$ (24,450)	\$ 18,610	\$ (69,084)
Fixed Assets					
Depreciation	\$ (7,667)	\$ (8,948)	\$ (1,282)	\$ (2,559)	\$ 5,107
Computer & Software CapEx	-	-	-	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	95,361	(1,427)	(96,788)	21,170	(74,192)
Inc(Dec) in Fixed Assets (B)	\$ 87,695	\$ (10,375)	\$ (98,070)	\$ 18,610	\$ (69,084)
TOTAL BUDGET (=A+B)	\$ 4,032,862	\$ 3,964,433	\$ (68,429)	\$ 3,846,648	\$ (186,214)
FTEs	5.64	5.98	0.34	5.64	-

Event Analysis

Event Analysis (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	11.28	11.28	-
Direct Expenses	\$ 2,592,388	\$ 2,680,449	\$ 88,061
Indirect Expenses	2,748,677	2,523,644	(225,032)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	105,141	(42,604)	(147,745)
TOTAL BUDGET	\$ 5,446,206	\$ 5,161,490	\$ (284,717)

Background and Scope

The Event Analysis department performs assessments of the reliability and adequacy of the BES. This includes identifying potential issues of concern related to system, equipment, entity, and human performance that may indicate a need to develop remediation strategies, action plans, or data used to revise or retire reliability standards or consider new reliability standards. The department analyzes and determines the cause of the events, promptly ensures tracking of corrective actions to prevent recurrence, and provides lessons learned to the industry. Event Analysis ensures that reporting and analysis are consistent to allow wide-area assessment of trends and risks. The department analyzes all reportable events for sequence of events, root cause, risk to reliability, and mitigation and keeps the industry well informed of system events, emerging trends, risk analysis, lessons learned, and expected actions.

Additional resources within this department focus on identifying human-error risks and those precursor factors that allow human error to impact system reliability. The department educates industry regarding risks, precursors, and mitigation methods. Resources also support compliance and standards training initiatives and trending and analysis to identify emerging reliability risks to the BES. These efforts are conducted in collaboration with industry human performance projects, including WECC's Human Performance Working Group, the NERC Operating Committee's Event Analysis Subcommittee, and others.

Stakeholder Engagement and Benefit

The Event Analysis department coordinates event analyses to support the use of collective resources, consistency in analysis, and timely delivery of event analysis reports.²⁵ The ERO disseminates to the electric industry lessons learned and other useful information obtained from or as a result of event analysis. The Event Analysis team conducts in-depth analyses of approximately 150 events per year on average. In 2014, the team also conducted calls facilitated by the Regional Entities with over 140 registered entities to discuss in detail and finalize root and contributing causes for the categorized events analyzed. Major analysis to date includes continuing assessment of Energy Management System (EMS) outages, continued collaboration with RASA on frequency response performance, analyses of substation equipment failure events and protective relay trends including ground overcurrent relay misoperations, relay communication system failures, and the importance of commissioning testing.

²⁵ The core process for Event Analysis is outlined in the approved process: Electric Reliability Organization Event Analysis Process - Version 3 (January 2016).

Collaboration with the Trade Associations and Forums

The activities of the NATF, the NAGF, trade associations, and other industry groups are expected to compliment ERO Enterprise activities and limit the need to add incremental resources to the NERC and Regional Entity BP&Bs that might otherwise be required in the absence of these forums.

NATF has been invited to participate in several reliability initiatives that are expected to continue into 2018, including protection systems misoperations reduction, physical security, various activities related to reliability assurance initiatives, improvement of modeling practices, and complementary efforts on addressing the GMD challenges.

2018 Goals and Deliverables

In 2018, the Event Analysis department will seek to accomplish several specific goals and objectives as part of the strategic focus of the ERO Enterprise:

- Work with the Regional Entities to obtain and review information from registered entities on qualifying events and disturbances to advance awareness of events above a threshold level; facilitate analysis of root and contributing causes, risks to reliability, wide-area assessments, and remediation efforts; and disseminate information regarding events in a timely manner;
- Ensure that all reportable events are analyzed for sequence of events, root cause, risk to reliability, and mitigation;
- Continue to refine risk-based methods to support better identification of reliability risks, including the use of more sophisticated cause codes for analysis;
- Conduct training (webinars, workshops, and conference support) to inform industry and the ERO of lessons learned, root cause analysis, trends, human performance, and extreme weather preparedness and recommendations;
- Develop reliability recommendations and alerts as needed and track industry accountability for critical reliability recommendations;
- Ensure that industry is well informed of system events, emerging trends, risk analysis, lessons learned, and expected actions;
- Conduct major event analysis and reporting of major findings and recommendations that will improve reliability; and
- Perform oversight, as per the Event Analysis Oversight Plan, of the activities and performance of the Regional staffs.

The Event Analysis department will also support several of the top-priority reliability risk projects during 2018 through 2019, as identified and described under the Performance Analysis department section of this document.

Resource Requirements

Personnel

There is no change in personnel from the 2017 to 2018 budget.

Contractor Expenses

No funding is budgeted for contract and consultants in 2018, which is consistent with 2017.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
EVENT ANALYSIS					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 5,300,955	\$ 5,300,955	\$ (0)	\$ 5,061,521	\$ (239,434)
Assessment Stabilization Reserve - Penalties	104,970	104,970	(0)	52,174	(52,796)
Total NERC Funding	\$ 5,405,926	\$ 5,405,926	\$ (0)	\$ 5,113,695	\$ (292,230)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	40,000	115,300	75,300	40,000	(0)
Interest	281	10,143	9,862	7,794	7,514
Miscellaneous	-	-	-	-	-
Total Funding	\$ 5,446,206	\$ 5,531,368	\$ 85,162	\$ 5,161,490	\$ (284,717)
Expenses					
Personnel Expenses					
Salaries	\$ 1,708,049	\$ 1,759,073	\$ 51,024	\$ 1,783,120	\$ 75,072
Payroll Taxes	108,739	110,729	1,990	110,619	1,880
Benefits	212,232	243,635	31,403	227,802	15,570
Retirement Costs	189,397	179,727	(9,670)	198,179	8,782
Total Personnel Expenses	\$ 2,218,416	\$ 2,293,163	\$ 74,747	\$ 2,319,720	\$ 101,304
Meeting Expenses					
Meetings	\$ 81,500	\$ 170,000	\$ 88,500	\$ 81,500	\$ (0)
Travel	152,487	158,000	5,513	150,000	(2,487)
Conference Calls	4,270	4,414	144	-	(4,270)
Total Meeting Expenses	\$ 238,257	\$ 332,414	\$ 94,157	\$ 231,500	\$ (6,757)
Operating Expenses					
Consultants & Contracts	\$ -	\$ -	\$ -	\$ -	\$ -
Office Rent	-	-	-	-	-
Office Costs	49,634	41,238	(8,396)	43,786	(5,848)
Professional Services	-	-	-	-	-
Miscellaneous	500	700	200	500	-
Depreciation	85,582	85,582	0	84,943	(639)
Total Operating Expenses	\$ 135,715	\$ 127,519	\$ (8,196)	\$ 129,229	\$ (6,487)
Total Direct Expenses	\$ 2,592,388	\$ 2,753,097	\$ 160,708	\$ 2,680,449	\$ 88,061
Indirect Expenses	\$ 2,748,677	\$ 2,856,590	\$ 107,913	\$ 2,523,644	\$ (225,032)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 5,341,065	\$ 5,609,687	\$ 268,622	\$ 5,204,093	\$ (136,972)
Change in Assets	\$ 105,141	\$ (78,318)	\$ (183,460)	\$ (42,604)	\$ (147,745)
Fixed Assets					
Depreciation	\$ (85,582)	\$ (85,582)	\$ (0)	\$ (84,943)	\$ 639
Computer & Software CapEx	-	-	-	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	190,723	(2,720)	(193,443)	42,339	(148,383)
Inc(Dec) in Fixed Assets (B)	\$ 105,141	\$ (88,302)	\$ (193,443)	\$ (42,604)	\$ (147,745)
TOTAL BUDGET (=A+B)	\$ 5,446,206	\$ 5,521,385	\$ 75,179	\$ 5,161,490	\$ (284,717)
FTEs	11.28	11.40	0.12	11.28	-

Performance Analysis

Performance Analysis (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	9.40	9.40	-
Direct Expenses	\$ 2,459,356	\$ 2,639,101	\$ 179,746
Indirect Expenses	2,290,564	2,103,037	(187,527)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	158,936	(108,716)	(267,652)
TOTAL BUDGET	\$ 4,908,855	\$ 4,633,422	\$ (275,433)

Background and Scope

The Performance Analysis department (PA) has reorganized to integrate significant additional leadership responsibilities as well as workload into its role within Reliability Risk Management. It currently consists of Balancing and Frequency Control (B&FC) and Data Analytics (DA) and provides significant statistical analysis and support for NERC, as well as the ERO Enterprise from the Sr. Manager of Statistical Analysis & Outreach. The outreach activity includes initiatives with Regions and highly technical electricity industry-related organizations.

B&FC focuses on balancing related technical requirements and risk identification for the BPS that are essential for its continued reliability. Acting in its new role as NERC's point for BPS balancing issues, B&FC coordinates activities performed by other organizations within NERC, as well as by groups such as the Resource Subcommittee within NERC's industry supported committee structure. B&FC has also assumed its own significant activities including providing administration of, or often performance of, tasks assigned to NERC within standards such as BAL-003-1. B&FC is also providing valuable leadership to integrate Process Information (PI) Historian into NERC, and to ensure the development of its applications for the near and long term. Descriptions of B&FC are accorded more specificity within this document because it is so new within the PA organization.

DA performs the legacy role of data collection and analysis necessary to document and communicate the BPS's historical performance via the annual *SOR Report* and other reports, as well as to support reliability assessments and other initiatives conducted by peer organizations within NERC and the ERO Enterprise. DA also administers a significant, newly formalized oversight of functions delegated by NERC to the Regions within the ERO Enterprise. Additionally, DA is providing business guidance and support as it partners with NERC's IT organization to develop enhanced software tools and new internal databases.

Balancing & Frequency Control Scope

B&FC provides support and services necessary for the real-time operation of the BPS in the areas of balancing resources and demand, interconnection frequency, interchange scheduling, and control performance. B&FC is responsible for providing technical assistance in the development and administration of the NERC Balancing Standards (BAL) that include BAL-001 Real Power Balancing Control Performance, BAL-002 Disturbance Control Performance, BAL-003 Frequency Response and Frequency Bias Setting, BAL-004 Time Error Correction, and BAL-006 Inadvertent Interchange. B&FC is also instrumental in performing the analysis and development of annual reports and informational filings that satisfy the FERC directives set forth in the Orders that approved the balancing standards.

B&FC supports the Resources Subcommittee (RS), Frequency Working Group (FWG), Inadvertent Interchange Working Group (IIWG), and Reserves Working Group (RWG) through facilitation of quarterly

in-person meetings, organizing and hosting of teleconferences as needed, drafting and posting of agendas and meeting minutes, and hosting subcommittee and industry webinars. B&FC also maintains the RS website and Balancing Authority Submittal Site (BASS), which are critical to industry stakeholders by providing operational information and a submittal mechanism for the aforementioned balancing standard requirements.

The NERC Planning Committee and Operating Committee jointly created the Essential Reliability Services Working Group (ERSWG) to advance the work initiated by the Essential Reliability Services Task Force (ERSTF) in consideration of the technical and operational impacts to BPS reliability that could result from the changing generation resource mix throughout North America. B&FC provides support through data collection, analysis, and reporting for five of the ERS measures that include Measure 1 Synchronous Inertial Response at an Interconnection Level, Measure 2 Initial Frequency Deviation Following Largest Contingency, Measure 3 Synchronous Inertial Response at a Balancing Authority (BA) Level, Measure 4 Frequency Response at an Interconnection Level, and Measure 6 Net Demand Ramping Variability.

In 2017, B&FC partnered with RRM SA, NERC IT, and OSIssoft to accomplish the specification, development, and installation of a PI Historian system that will allow NERC to retrieve, analyze, and report on data that is currently hosted and analyzed by external parties. The initial data includes interconnection frequency and BA Area Control Error across North America and provides enhanced wide area visualization and analysis of the North American BES. B&FC is leading the effort to build the Asset Framework hierarchy that will further enhance analysis and reporting that support the efforts of NERC staff and standing committees. Near-term project initiatives will include the retrieval of high speed sub-second frequency data from the University of Tennessee at Knoxville into the NERC PI Historian. While the implementation of PI Historian at NERC is a very large step forward, the maintenance of this database and continued development of visualization, analysis, and reporting tools will be a considerable effort and resource requirement going forward.

Data Analytics Scope

DA is responsible for the collection, management, and analysis of data related to the performance of five areas of BPS operations: transmission, conventional generation, wind generation, protection system misoperations, and demand response. DA also provides application training and end-user support to reporting entities and regional staff. DA collaborates with internal and external stakeholders through working groups associated with the industry sectors reporting performance data to define and revise reporting requirements and related applications. Analysis performed by DA includes identifying potential risks of concern related to system, equipment, entity, and organizational performance that may indicate a need to develop remediation strategies, improvements to the reporting applications, new data collection or analysis tools, or data used to create, revise, or retire reliability standards or consider new reliability standards or reporting areas. Such analysis provides the foundation for the annual *SOR Report*, the annual Misoperations report, and technical papers to the industry.

DA continues the 2016 emergent trend of highly concentrated business engagement in IT projects. 2017 projects include: deployment of the Wind data collection system; development and implementation of the data sharing process to comply with FERC Order 824; development of the first portal application on the NERC enterprise platform; integration of the next application data set for the ERO data warehouse; and contributed to the document management project implementation for RRM. Throughout these projects, DA has developed effective and efficient processes and work products that are being adopted by the NERC's Project Management Office as models for other NERC projects. To improve data quality, DA conducted multiple multi-day in-person training sessions for end-users that provide data to the reporting applications. In addition to its legacy work with data collection and analysis, DA will continue to provide

business subject matter expertise for several IT projects, including new data reporting and analytical tools, projects to support FERC data needs, ERO data sharing, as well as projects with other NERC groups.

Stakeholder Engagement and Benefit

The ERO monitors the reliability performance of the BES in North America through data gathered to analyze historic trends. The ERO provides reports and recommendations regarding the anticipated conditions that could impact the reliability, security, and stability of the BPS to the industry, Regional Entities, regulatory entities, and other designated entities.

The ERO works with industry leaders to create a reliability strategy that is relevant, timely, and effective at addressing the most important reliability risks. This effort includes PA's contribution (including its data gathering and statistical analyses of data, trends, and events) toward the ERO's understanding of key information identified through analysis and assessment efforts; extraction and prioritization of the associated reliability risks from that information; communication and integration of those risk analysis insights across the ERO Enterprise; and translation of that knowledge into actionable guidance and recommendations for NERC management, the Board, and entities, and state, federal, and provincial policy makers. This offers stakeholders an open and transparent approach for the development of NERC's reliability strategy, ultimately ensuring the ERO is accountable to industry, regulators, and the public at large.

B&FC will continue to support the RS, ERSWG, and industry stakeholders through performance based webinars, technical whitepapers, reliability guidelines, and individual outreach. These efforts have proven successful throughout 2016 and 2017, with an emphasis on frequency response performance and operational capabilities.

Key Efforts Underway

In addition to support of the RS and its working groups, the maintenance and administration of the BAL is a major effort for B&FC, with particular current focus on BAL-003-1 Frequency Response and Frequency Bias Setting. B&FC fulfils the ongoing tasks assigned to the ERO in BAL-003-1 Attachment A and the Procedure for ERO Support. These tasks include, but are not limited to:

- Ongoing quarterly identification, review, selection, and posting of BAL-003-1 and M-4 frequency events for use by BAs and other industry stakeholders;
- Calculation and posting of Minimum Frequency Bias Settings for each BA;
- Calculation and assignment of BA Frequency Response Obligations for the upcoming year;
- Calculation and assignment of BA annual Frequency Bias Settings and L10 values for April implementation into BA control systems;
- Performing ongoing maintenance of and necessary modifications to BAL-003-1 FRS Forms used by BAs to calculate frequency response performance and document bilateral purchase or sale of frequency response and/or participation in a Frequency Response Sharing Group in accordance with BAL-003-1; and
- Maintaining the Balancing Authority Submission Site (BASS) used by BAs for BAL-003-1 submittals and performance of vetting for stakeholders requesting access to the BASS.

A major effort in 2018 will be the development of the technical report to be filed with FERC, in accordance with the directives set forth in Order 794, in addition to development of the *Frequency Response Annual Analysis Report*.

B&FC supports the annual State of Reliability (*SOR Report*) by providing data and analysis for interconnection frequency response (M-4) and related statistical analysis.

Another major effort in 2018 will be the expansion of the PI Historian to include high speed frequency data from the University of Tennessee at Knoxville, as well as interconnection inertia data to support efforts of the RS and ERSWG.

The key trends, findings, and recommendations from PA serve as technical input to the ERO's reliability standards and standards project prioritization, compliance process improvements, event analyses, reliability assessment, and critical infrastructure protection efforts. This analysis of BES performance provides an industry reference for historical BES reliability, but it also offers analytical insights that lead toward the prioritization of specific actionable risk control steps for industry. These analyses and results are summarized in the annual *SOR Report*, which provides guidance and recommendations for enhanced bulk system reliability. PA has added GADS Wind Data to the data collected under NERC ROP Section 1600, requiring the development of a new software tool to enable this. In 2018, DA will begin development for the requirements for solar data collection.

PA is working with EA to develop a link between their databases. Specific equipment outages will be linked to disturbance reports filed with NERC, enabling better association of transmission and generation outages. The continued alignment between these efforts is expected to enhance the ability to conduct effective event analyses as well as to identify key reliability areas for trend analyses of multiple databases. This is expected to improve the depth of event analyses across the ERO Enterprise and expand the quality of data gathered for sophisticated statistical and probabilistic analyses. This will lead to trends and insights about reliability performance, as well as effective measures and actions to address reliability risks. PA has begun data mining of completed EA efforts to see if any insight might be gained from these events as the grid evolves that were not first and foremost or particularly relevant to enhanced grid reliability at the time of the original event investigation.

PA is currently refining the composition of NERC's annual *SOR Report* to expand the GADS data trend analysis and, for 2017, has begun reflecting post-seasonal reliability review, insights from analysis of transmission, generator, and demand response data systems (TADS, GADS, and DADS), and integration of event analysis and misoperations. Also, in 2018, the department will implement the decision of whether the *SOR Report* should move from a calendar year (Q1-Q4) report to a fiscal year (Q4-Q3) report. Current dynamics around validation and reporting of corporate metrics might even move the *SOR Report* to a Q3-Q2 reporting to accommodate the needs of this activity within a common reporting framework.

Further, PA will continue to work closely with other organizations, including but not limited to the EPRI, the DOE, the IEEE, INPO, the NATF, the NAGF, and the CEA. PA collaborates with these groups on a number of fronts, including TADS, GADS, and DADS.

2018 Goals and Deliverables

In 2018, PA has a number of specific goals and deliverables in support of the ERO Enterprise Strategic Plan, including:

- Issue the *SOR Report*, guidelines, recommendations, and alerts as needed (including the verification and validation of data and information through Regional Entities and technical committees, as required);
- Provide support and leadership to the Operating Committee, Operating Reliability Subcommittee, and RS and its working groups, the FWG, IIWG, and RWG, with emphasis on balancing operations

and analysis, administration of balancing standards, and performance-based outreach to functional entities responsible for real-time BPS reliability;

- B&FC began the administration of the BAL Balancing Standards in 2017 with current emphasis on BAL-003-1. This effort will continue in 2018;
- B&FC will provide technical assistance to NERC Compliance and Enforcement with emphasis on BAL-003-1 Frequency Response for the BA performance requirements that became effective in the 2017 operating year;
- B&FC will acquire the ongoing annual development of the Frequency Response Annual Analysis Report from RASA in 2017. This report is necessary to identify changes in frequency response performance and recommend changes in Interconnection Frequency Response Obligations in accordance with BAL-003-1;
- FERC Order 794 approving the BAL-003-1 standard directed NERC to submit a report in 2018 addressing an (1) evaluation of the use of linear regression methodology to calculate frequency response and (2) the availability of resources for applicable entities to meet the Frequency Response Obligation. B&FC will lead this effort;
- B&FC will begin the development of quarterly BPS performance reports using PI Historian data and functionality to support the demands of the Operating Committee and RS;
- Oversee and evaluate reliability trends that identify reliability risks by analyzing data contained in NERC's GADS, TADS, and DADS, along with reliability metrics and protection & controls system misoperations data;
- Support NERC Reliability Standard development by providing subject matter expertise;
- Provide support and leadership to the Planning Committees' subcommittees, working groups, and task forces (primary focus on the Performance Analysis Subcommittee (PAS) and its subgroups);
- Assist in the development of approaches to registration and provide input to NERC staff in support of the development of CMEP risk elements;
- Conduct major event investigations, analyses, and reporting of major findings, recommendations, and lessons learned that will improve reliability; and
- Provide insight on emerging system protection issues, and hand-off any issues gleaned with future implications to RASA.

Resource Requirements

Personnel

There is no change in personnel from the 2017 to 2018 budget, but ongoing growth in PA responsibilities and activities may drive future resource needs.

Contractor Expenses

PA's 2018 budgeted contractor and consultant expenses are \$572k, which is a \$44k increase over 2017, primarily due to an increased need for OATI technology updates. A comparison of the budgeted 2017 and 2018 expenses is shown in *Exhibit C – Contractor and Consulting Costs*.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
PERFORMANCE ANALYSIS					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 4,821,146	\$ 4,821,146	\$ 0	\$ 4,533,448	\$ (287,698)
Assessment Stabilization Reserve - Penalties	87,475	87,475	(0)	43,478	(43,997)
Total NERC Funding	\$ 4,908,621	\$ 4,908,621	\$ 0	\$ 4,576,927	\$ (331,695)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	50,000	50,000	50,000	50,000
Workshops	-	-	-	-	-
Interest	234	8,086	7,852	6,495	6,261
Miscellaneous	-	-	-	-	-
Total Funding	\$ 4,908,855	\$ 4,966,707	\$ 57,852	\$ 4,633,422	\$ (275,433)
Expenses					
Personnel Expenses					
Salaries	\$ 1,349,579	\$ 1,340,257	\$ (9,322)	\$ 1,372,376	\$ 22,796
Payroll Taxes	92,093	88,681	(3,411)	92,361	268
Benefits	143,104	144,794	1,691	154,799	11,696
Retirement Costs	149,018	151,137	2,120	154,224	5,206
Total Personnel Expenses	\$ 1,733,794	\$ 1,724,871	\$ (8,923)	\$ 1,773,760	\$ 39,966
Meeting Expenses					
Meetings	\$ 1,000	\$ 15,000	\$ 14,000	\$ 11,000	\$ 10,000
Travel	118,172	98,000	(20,172)	80,000	(38,172)
Conference Calls	2,965	2,872	(93)	-	(2,965)
Total Meeting Expenses	\$ 122,137	\$ 115,872	\$ (6,265)	\$ 91,000	\$ (31,137)
Operating Expenses					
Consultants & Contracts	\$ 528,082	\$ 571,132	\$ 43,050	\$ 572,030	\$ 43,948
Office Rent	-	-	-	-	-
Office Costs	74,843	63,310	(11,533)	57,812	(17,031)
Professional Services	-	-	-	-	-
Miscellaneous	500	250	(250)	500	-
Depreciation	-	179,910	179,910	143,999	143,999
Total Operating Expenses	\$ 603,426	\$ 814,602	\$ 211,177	\$ 774,341	\$ 170,916
Total Direct Expenses	\$ 2,459,356	\$ 2,655,345	\$ 195,989	\$ 2,639,101	\$ 179,746
Indirect Expenses	\$ 2,290,564	\$ 2,197,570	\$ (92,994)	\$ 2,103,037	\$ (187,527)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 4,749,920	\$ 4,852,915	\$ 102,995	\$ 4,742,138	\$ (7,781)
Change in Assets	\$ 158,936	\$ 113,793	\$ (45,143)	\$ (108,716)	\$ (267,652)
Fixed Assets					
Depreciation	\$ -	\$ (179,910)	\$ (179,910)	\$ (143,999)	\$ (143,999)
Computer & Software CapEx	-	462,725	462,725	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	158,936	(2,093)	(161,028)	35,283	(123,653)
Inc(Dec) in Fixed Assets (B)	\$ 158,936	\$ 280,722	\$ 121,787	\$ (108,716)	\$ (267,652)
TOTAL BUDGET (=A+B)	\$ 4,908,855	\$ 5,133,637	\$ 224,781	\$ 4,633,422	\$ (275,433)
FTEs	9.40	8.77	(0.63)	9.40	-

Electricity Information Sharing and Analysis Center (E-ISAC)²⁶

E-ISAC (including CRISP) (in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	19.74	29.14	9.40
Direct Expenses	\$ 12,276,689	\$ 15,056,942	\$ 2,780,253
Indirect Expenses	4,810,185	6,519,415	1,709,230
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	1,428,467	274,241	(1,154,227)
TOTAL BUDGET	\$ 18,515,341	\$ 21,850,597	\$ 3,335,256

Background and Scope

The Electricity Sector Information Sharing and Analysis Center (ES-ISAC) was formed in 1998 when the U.S. Secretary of Energy requested that NERC serve as the ISAC²⁷ for the Electricity Subsector.²⁸ This department was rebranded to the Electricity Information Sharing and Analysis Center (E-ISAC) in September 2015. The E-ISAC reduces cyber and physical risk to the electricity industry across North America by providing unique insights, leadership, and coordination. The vision is to be the trusted, timely, actionable resource of grid risk information and analysis to enhance electricity reliability. The E-ISAC facilitates electricity industry and cross-sector coordination regarding physical security and cybersecurity events affecting the grid.

Maintaining Separation from Compliance and Enforcement

In February 2012, and as amended in March 2013, the Board of Trustees approved an E-ISAC Policy Statement that established a separation between the E-ISAC and NERC's compliance and enforcement program. In 2015, physical separation of the E-ISAC was completed. The company also has in place an E-ISAC Code of Conduct²⁹ and Policy on the Role of the E-ISAC vis-à-vis NERC's Compliance Monitoring and Enforcement Program³⁰.

Key Efforts Underway

With industry support, in coordination with the ESCC and its Members Executive Committee (MEC), senior management is committed to enhancing the effectiveness and capabilities of E-ISAC operations. These efforts include ongoing enhancement in organizational structure, operational and analytical capabilities, as well as the development of metrics to track the effectiveness of operations. Management will also take steps to improve the quality and value of E-ISAC products, including ongoing review of registered user needs.

During 2015, as part of a periodic review of companywide resource needs and resource allocation, NERC allocated additional resources to support the E-ISAC. Management recruited personnel to fill open positions, and recruited and appointed a senior vice president and chief security officer in charge of E-

²⁶ In 2015, NERC combined its Critical Infrastructure Department (CID) into the E-ISAC for both operational and financial reporting purposes.

²⁷ The Information Security Analysis Center (ISAC) construct was conceived and operates under US Government authorities derived from Presidential Decision Directive 63, which was signed in 1998. The ISAC focuses specifically on information sharing, analytics and sector activities directly related to the protection of critical infrastructure.

²⁸ Subsequent administrations have sought to continue and strengthen information sharing in other sectors by establishing other sector-specific ISACs. In 2013, the Department of Energy (DOE) again reaffirmed its desire for NERC to continue to operate the E-ISAC.

²⁹ [E-ISAC Code of Conduct](#)

³⁰ [Policy on the Role of the E-ISAC vis-à-vis NERC's Compliance Monitoring and Enforcement Program](#)

ISAC operations. Ongoing resource requirements consist primarily of personnel, contractors, consultants, software, hardware and communications infrastructure to gather, analyze, and provide information regarding cyber and physical security threats.

In the fourth quarter of 2014 and with broad industry support, NERC also assumed management responsibility for the Cybersecurity Risk Information Sharing Program (CRISP). CRISP is a public-private partnership whose purpose is to facilitate the sharing of cyber threat information and to develop situation awareness tools that enhance the electricity sector's ability to identify, prioritize, and coordinate the protection of its critical infrastructure. CRISP provides critical infrastructure owners and operators the capability to voluntarily share cyber threat data, analyze this data, and receive machine-to-machine mitigation measures. Information-sharing devices that are installed on participants' networks send encrypted data to a CRISP analysis center operated by the Pacific Northwest National Labs (PNNL), which analyzes the data it receives and sends alerts and mitigation measures back to CRISP participants and the E-ISAC through secure communications. CRISP became fully operational in 2015. The E-ISAC will continue to work with PNNL, CRISP participants and E-ISAC registered users to strengthen program execution, including both quality and timeliness aspects of information sharing. The 2018 E-ISAC budget maintains the same percentage allocation of CRISP funding requirements from assessments (50%) and from CRISP participants (50%) as 2017. In connection with the growth of the program and related support needs from E-ISAC staff, the 2017 E-ISAC budget also reflects an increase in the number of budgeted E-ISAC FTEs allocated to support CRISP.

Other new information sharing and analysis tools deployment will further increase the speed and ease of sharing cyber threat information.

E-ISAC Long-Term Strategy

Over the past several years the E-ISAC has focused on improving its technical and analytical capabilities with a goal of becoming the electricity industry's leading, trusted source for analysis and sharing of security information. Significant support from the Electricity Subsector Coordinating Council (ESCC), the ESCC Members Executive Committee (MEC), the U.S. Department of Energy, and other stakeholders have helped the E-ISAC be responsive to the industry's needs in order to provide unique insights, leadership, and coordination for security matters.

At the request of the NERC Board and under the guidance of the ESCC and MEC, executive leadership of the E-ISAC developed a long-term strategic plan, a copy of which is included as *Exhibit F – E-ISAC Long-Term Strategy*. The E-ISAC Long Term Strategic Plan was approved by the MEC on April 24, 2017 and accepted by the NERC Board of Trustees on May 11, 2017. The long-term strategic plan is to transform the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry.

To carry forth this vision, the E-ISAC is planning a continuous and deliberate growth strategy over the next five years that increases both staff and technical resources. The 2018 BP&B includes the recommended increases to accommodate this long-term strategy, as further described in *Exhibit F – E-ISAC Long-Term Strategy*. This strategy significantly expands on the resources and activities discussed in this section, and those incremental costs are reflected in this 2018 budget based on the positive feedback and support of industry and stakeholder representatives.

Program Level Support

CRISP

During 2017 and 2018, NERC will continue to subcontract to PNNL the majority of the resource requirements and associated costs to operate and maintain CRISP.

E-ISAC Portal Replacement

The E-ISAC communication portal capabilities include publishing immediate notifications and other informational products, exchanging threat indicator information, and providing self-service access to user security awareness services. The E-ISAC is working with NERC Information Technology to completely replace the portal in 2017 to provide important new enhancements and improved capabilities. These include facilitating direct data exchange with E-ISAC members, other ISACs and government partners, and establishing user communities where individuals can discuss security issues. The portal's improved capabilities support E-ISAC analysts in their information analysis functions and directly tie them with their counterparts in other sectors and national laboratories.

The 2017 E-ISAC budget includes \$1M for the portal enhancements (\$250k of which is allocated to CRISP)³¹. The MEC has provided written comments in support of this investment.³² The 2018 E-ISAC budget includes \$350k for ongoing portal maintenance and licensing costs.

Software and Services

Watch Operations Technology

The E-ISAC operations center includes monitors used to display intelligence information provided from various software applications. Software integration services are routinely required from vendors providing existing and new software applications. Additional software must be licensed and maintained to display and integrate BES maps that have cyber intelligence information. A technology refresh of displays is planned for 2018.

Threat Analysis Tools

A strong technical analytic capability is needed to develop baselines and identify patterns and understandings of potential cyber-related threats. The analyst workbench toolset maintains historical information and allows a team to use and deliver consistent and repeatable analysis in both an operational (during an event), as well as nonoperational capacity. This workbench will include a threat database for historical correlation and various tools for network- and host-based analysis of malicious software.

Cyber Automated Information Sharing System (CAISS)

The E-ISAC broadened automated information sharing beyond CRISP, looking at programs such as the Structured Threat Information Expression/Trusted Automated Exchange of Indicator Information (STIX/TAXII) initiative hosted by the U.S. Department of Homeland Security. As part of a work plan developed in consultation with the MEC, in 2017 the E-ISAC piloted these technologies, leveraging existing implementations at Argonne National Lab, into CAISS. The pilot helped the E-ISAC understand the nuances of bi-directional communication, workflow, handling rules, vetting information, and learning from the technology and processes overall. The CAISS pilot will transition to an operational program in Q3 of 2017.

Intelligence Reporting Services

E-ISAC analytic personnel maintain a detailed understanding of emerging vulnerabilities and threats within the broad industrial control systems community, as well as within the more focused BES community. To support this intelligence role, the E-ISAC budget includes the costs for intelligence services from a specialized security information service provider that focuses closely on the electricity subsector. This service gives E-ISAC staff increased understanding of continuing trends, breaking news, and

³¹ The annual impact of the proposed \$1M investment on assessments will be approximately \$250,000 since projects of this nature are typically financed through NERC's capital financing program and funded over a three year period.

³² [MEC comments](#)

implications to the BES, which E-ISAC staff utilizes to keep registered entities informed of emerging BES risks through immediate notifications and portal security postings.

Events and Outreach

Grid Security Exercises

Since 2011, NERC has sponsored a series of biennial grid security exercises (GridEx). These geographically distributed exercises are designed to exercise the electricity sector's crisis response to simulated coordinated cybersecurity and physical security threats and incidents, to strengthen utilities' crisis response functions, and to provide input for lessons learned. GridEx III, in November 2015, consisted of a two-day grid-focused operational exercise for participants across North America and a half-day tabletop discussion for executives. The E-ISAC manages the program and collects industry information during and after the exercise subject to existing data collection policies. During the exercise, E-ISAC watch and analysis staff exercise the E-ISAC mission and share severe crisis information and analysis towards mitigating the threats and attacks. Lessons learned and recommendations are turned over to groups like NERC's Board and CIPC and to the ESCC for consideration and coordination between industry and government stakeholders. GridEx IV is scheduled for November 15-16, 2017. Funding for the two-year planning cycle for GridEx V will be required in 2018 and 2019.

Grid Security Conferences

Since 2011, NERC has sponsored a series of annual grid security conferences (GridSecCon). These conferences bring together industry and government subject matter experts on cyber, physical and operations technology threats and solutions, with training sessions and classified or official use briefs on topics vital to grid security. The E-ISAC provides expertise and gathers appropriate speakers, panelists and training providers. GridSecCon 2017 is scheduled for October 17-20 in St. Paul, Minnesota, with the 2018 planned for the SPP region in October.

Stakeholder Engagement

E-ISAC staff routinely engage stakeholders in virtual and in-person meetings, to include CIPC, ESCC, MEC, and BOT meetings, monthly briefings, threat workshops, and presentations to regions, entities, and other stakeholder groups.

Resource Requirements

Personnel

In 2018, resources are being added to provide support to the E-ISAC, resulting in a net increase of 9.4 FTEs. This is primarily to address immediate needs for analytical capabilities.

The E-ISAC staffing and organizational structure has been updated to reflect two primary focus areas (1) Operations and (2) Programs and Engagement. Operations consists of watch operations, cyber security and CRISP analysis, and physical security analysis groups. Programs and Engagement consists of member engagement, cross-sector engagement, training and exercises, products and services, and program management.

Due to the highly technical nature and evolving threat vectors, the E-ISAC staff requires ongoing specialized training and education.

The E-ISAC will continue to receive shared services support from NERC's corporate services departments (i.e. Finance and Accounting, Information Technology, Human Resources, Legal and Regulatory Affairs). Personnel providing such shared services will do so only in accordance with strict operating protocols

governing access to and use of E-ISAC information as noted above. In addition, the E-ISAC will provide opportunities for qualified interns.

Contract and Consultant Expenses

The total budgeted consultants and contracts expense for the E-ISAC for 2018, including CRISP, is approximately \$7.4M, an increase of \$193k from the 2017 budget. CRISP’s consultants and contracts expense is \$6.3M, which is \$403k more than was in the 2017 budget. This change is largely due to increased project support needs, as well as higher security review costs. A further breakdown of the budgeted 2017 and 2018 costs is provided in *Exhibit C – Contractor and Consulting Costs*.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection and 2018 Budget					
E-ISAC (including CRISP)					
	2017	2017	Variance		Variance
	Budget	Projection	2017 Projection	2018	2018 Budget
			v 2017 Budget	Budget	v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 11,270,705	\$ 11,270,705	\$ (0)	\$ 14,297,524	\$ 3,026,819
Assessment Stabilization Reserve - Penalties	183,698	183,698	0	134,783	(48,915)
Total NERC Funding	\$ 11,454,403	\$ 11,454,403	\$ (0)	\$ 14,432,307	\$ 2,977,904
Third-Party Funding	\$ 6,990,447	\$ 7,400,905	\$ 410,458	\$ 7,324,253	\$ 333,806
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	70,000	70,000	(0)	70,000	(0)
Interest	491	26,231	25,739	24,038	23,546
Miscellaneous	-	-	-	-	-
Total Funding	\$ 18,515,341	\$ 18,951,538	\$ 436,197	\$ 21,850,597	\$ 3,335,256
Expenses					
Personnel Expenses					
Salaries	\$ 3,417,398	\$ 3,573,271	\$ 155,873	\$ 4,634,838	\$ 1,217,440
Payroll Taxes	204,023	213,551	9,528	290,702	86,679
Benefits	397,467	404,155	6,688	578,849	181,381
Retirement Costs	363,482	339,727	(23,754)	499,793	136,311
Total Personnel Expenses	\$ 4,382,370	\$ 4,530,705	\$ 148,335	\$ 6,004,182	\$ 1,621,812
Meeting Expenses					
Meetings	\$ 230,000	\$ 159,000	\$ (71,000)	\$ 127,000	\$ (103,000)
Travel	256,488	256,488	(0)	291,000	34,512
Conference Calls	6,710	23,295	16,585	-	(6,710)
Total Meeting Expenses	\$ 493,198	\$ 438,783	\$ (54,415)	\$ 418,000	\$ (75,198)
Operating Expenses					
Consultants & Contracts	\$ 6,788,429	\$ 7,728,528	\$ 940,099	\$ 7,391,794	\$ 603,365
Office Rent	-	-	-	-	-
Office Costs	431,895	359,035	(72,860)	907,330	475,435
Professional Services	175,000	173,107	(1,893)	250,000	75,000
Miscellaneous	500	1,250	750	500	-
Depreciation	5,297	86,092	80,795	85,136	79,838
Total Operating Expenses	\$ 7,401,121	\$ 8,348,012	\$ 946,891	\$ 8,634,760	\$ 1,233,639
Total Direct Expenses	\$ 12,276,689	\$ 13,317,500	\$ 1,040,811	\$ 15,056,942	\$ 2,780,253
Indirect Expenses	\$ 4,810,185	\$ 5,209,519	\$ 399,334	\$ 6,519,415	\$ 1,709,230
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 17,086,873	\$ 18,527,019	\$ 1,440,145	\$ 21,576,357	\$ 4,489,483
Change in Assets	\$ 1,428,467	\$ 424,520	\$ (1,003,948)	\$ 274,241	\$ (1,154,227)
Fixed Assets					
Depreciation	\$ (5,297)	\$ (86,092)	\$ (80,795)	\$ (85,136)	\$ (79,838)
Computer & Software CapEx	1,100,000	761,624	(338,377)	100,000	(1,000,000)
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	21,477	21,477	-	-
Leasehold Improvements	-	-	-	150,000	150,000
Allocation of Fixed Assets	333,765	(4,960)	(338,725)	109,377	(224,388)
Inc(Dec) in Fixed Assets (B)	\$ 1,428,467	\$ 692,047	\$ (736,420)	\$ 274,241	\$ (1,154,227)
TOTAL BUDGET (=A+B)	\$ 18,515,341	\$ 19,219,066	\$ 703,725	\$ 21,850,597	\$ 3,335,256
FTEs	19.74	20.79	1.05	29.14	9.40

Training, Education, and Personnel Certification

Training, Education, and Personnel Certification			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	7.05	5.88	(1.18)
Direct Expenses	\$ 1,922,295	\$ 1,708,013	\$ (214,282)
Indirect Expenses	1,717,923	1,314,398	(403,525)
Other Non-Operating Expenses	-	-	-
Inc(Dec) in Fixed Assets	117,283	20,613	(96,670)
TOTAL BUDGET	\$ 3,757,501	\$ 3,043,024	\$ (714,477)

Background and Scope

Training and Education

The Training and Education program provides oversight for coordination and delivery of learning materials, resources, and activities to allow for training and education of:

1. ERO Enterprise staff supporting statutory and delegation-related activities and
2. BPS industry participants consistent with ERO functional program requirements.

The Training and Education program supports NERC's responsibilities to develop, adopt, and obtain approval of reliability standards and to monitor, enforce, and achieve compliance with the mandatory standards. Section 901 of the NERC ROP addresses the program's obligations to industry stakeholders and ERO Enterprise staff. The responsibility to participate in the program is shared among the NERC departments³³, in conjunction with the Operational Leadership Team working groups.

System Operator certification is maintained by completing NERC-approved continuing education courses and activities. The Personnel Subcommittee, composed of industry training experts, provides oversight of the Continuing Education Program. Section 902 of the NERC ROP addresses the specific continuing education program expectations and activities.

Personnel Certification

The System Operator Certification program ensures that personnel operating the BPS have the skills, training, and qualifications needed to operate the system reliably. NERC maintains credentials for over 7,500 system operator credential holders who work in various industry areas across North America. NERC's system operator certification exam is designed to test specific knowledge of job skills and reliability standards. It also prepares operators for complying with requirements of reliability standards and appropriately operating the BPS during normal and emergency operations. The System Operator Certification Program is governed by the Personnel Certification Governance Committee (PCGC), an industry group of operations experts, trainers, and supervisors. Certification exams are created by the Exam Working Group (EWG), an industry group of operations subject matter experts. Under the PCGC oversight, the EWG reviews and updates job tasks and certification exams. Section 600 of the NERC ROP addresses the Personnel Certification activities in the area of Operator Certification.

³³ The Human Resources department is also engaged in training initiatives.

Key Efforts Underway

Training and Education

The ERO provides learning materials, resources, and activities to assist industry and ERO Enterprise staff in their understanding of key program areas. These areas include:

1. Risk-Based Compliance Monitoring and Enforcement;
2. Standards and Compliance;
3. Organization Registration and Certification;
4. Event Analysis, Cause Analysis, Performance Analysis, and Lessons Learned;
5. Reliability Assessment and System Analysis; and
6. Continuing education for system operators.

Personnel Certification

During 2018, the department plans on performing the following activities:

1. Continuing to update System Operator Certification Exam Item Bank to ensure relevance to current Reliability Standards and promote reliability of the BPS;
2. Developing Exam “Skills Assessment” process to better assess the skills and knowledge of System Operators;
3. Developing Strategic Plan for future System Operator Certification program; and
4. Evaluating credential review and rationalization to maintain credentials.

2018 Goals and Deliverables

Training and Education

The annual NERC and ERO Enterprise Learning Priorities Plan articulates and prioritizes the accumulated learning needs for the ERO Enterprise and the potential delivery vehicles supporting achievement of the corporate metrics for the strategic goals. Development and management of the plan is exercised through monthly meetings to ensure priorities are reviewed and updated based on the changing business landscape informed through input received by the various functional program managers on behalf of their respective programs, ERO Enterprise working groups, and leadership teams.

A theme-based approach describing audience needs facilitates identification and formulation of appropriate products throughout the year. It inspires modular (“interchangeable parts or building blocks”) thought in implementing a cross-cutting multi-use product model. Production is accomplished by combining in-house expertise and tools with vendor support to increase throughput that positively impacts the quality and timeliness of customer service.

NERC program leads spearhead the effort to identify gaps in program knowledge and associated learning needs of their employees, industry stakeholders, and ERO Enterprise partners. The following 2017 themes serve as building blocks for ongoing learning development work and will inform the priorities of focus in 2018 and beyond:

- *Reliability risk management technique*: share knowledge for maintaining the reliability of the bulk power system through assessment, analysis, and human interaction. (Industry)

- *Risk-based compliance performance*: enhance compliance monitoring personnel performance through a deeper understanding of ERO Enterprise compliance monitoring processes and technical aspects of the BPS operations. (ERO Enterprise)
- *Functional and technical enhancement*: enhance employee understanding of NERC functions and core technical knowledge for regulating the BPS. (NERC employees)

These themes provide connectivity of the annual learning development plan with the strategic goals through consideration and analysis of the associated strategic metrics.

NERC will also deliver training and education by hosting workshops and webinars, as well as computer-based and instructor-led training courses. The responsibility for subject matter expertise input to the learning development process is shared among multiple departments at NERC. The Training and Education department provides coordination and synchronization efforts for shared NERC and ERO Enterprise training responsibilities in addition to advancing and improving the skills of NERC's operating staff. The Human Resources department budgets and manages the delivery of more traditional corporate employee training and continuing education programs in concert with the coordination and synchronizing efforts of the Training and Education department.

The Continuing Education program evaluates and revises the current program criteria as reflected in the program manual. The evaluation considers the growth and maturation of industry programs, as well as ongoing research in the area of adult learning to ensure that the Continuing Education program efforts improve core objectives in addition to fostering improvement of training and promoting quality training programs in general.

Personnel Certification

The Personnel Certification program delivered new exams one year in advance of the documented exam cycle. Linear On the Fly Testing (LOFT), which is the dynamic creation of exams, was implemented in the newly published 2017 exams. As part of the ongoing exam development cycle, the EWG will continue to develop and analyze new items for future certification exams and ensure relevancy to current NERC Reliability Standards.

Key deliverables for the System Operator Certification Program:

- Annual analysis of exam Item Bank;
- New exam items;
- New credential maintenance tool; and
- Strategic plan for program enhancements.

NERC will continue to work with industry stakeholders and the exam development vendor to create certification exams that will promote reliability of the BPS.

Resource Requirements

Personnel

The combined 1.18 reduction in FTEs for both departments is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Contractor Expenses

The consulting and contractor budget for 2018 is approximately \$599k, which is \$18k higher than in 2017. A detailed breakdown of the 2017 and 2018 contractor and consulting budgets for Personnel Certification and Training and Education is set forth in *Exhibit C – Contractor and Consulting Costs*.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
TRAINING, EDUCATION, and PERSONNEL CERTIFICATION					
	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 1,822,089	1,822,089	\$ 0	\$ 1,309,031	\$ (513,058)
Assessment Stabilization Reserve - Penalties	43,738	43,738	0	17,391	(26,346)
Total NERC Funding	\$ 1,865,827	\$ 1,865,827	\$ 0	\$ 1,326,422	\$ (539,405)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	1,921,900	1,749,315	(172,585)	1,790,000	(131,900)
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	175	5,897	5,722	4,060	3,884
Miscellaneous	-	-	-	-	-
Total Funding	\$ 3,787,902	\$ 3,621,039	\$ (166,863)	\$ 3,120,482	\$ (667,420)
Expenses					
Personnel Expenses					
Salaries	\$ 852,091	\$ 721,344	\$ (130,746)	\$ 701,307	\$ (150,783)
Payroll Taxes	62,727	51,912	(10,815)	52,088	(10,638)
Benefits	139,239	94,579	(44,660)	95,207	(44,032)
Retirement Costs	97,624	80,875	(16,749)	79,353	(18,272)
Total Personnel Expenses	\$ 1,151,681	\$ 948,710	\$ (202,970)	\$ 927,956	\$ (223,725)
Meeting Expenses					
Meetings	\$ 55,000	\$ 42,500	\$ (12,500)	\$ 44,250	\$ (10,750)
Travel	21,139	28,000	6,861	17,000	(4,139)
Conference Calls	11,133	34,654	23,521	-	(11,133)
Total Meeting Expenses	\$ 87,272	\$ 105,154	\$ 17,882	\$ 61,250	\$ (26,022)
Operating Expenses					
Consultants & Contracts	\$ 580,600	\$ 796,624	\$ 216,024	\$ 598,900	\$ 18,300
Office Rent	-	-	-	-	-
Office Costs	100,323	99,060	(1,263)	117,969	17,646
Professional Services	-	-	-	-	-
Miscellaneous	500	100	(400)	500	-
Depreciation	1,919	1,919	-	1,439	(480)
Total Operating Expenses	\$ 683,342	\$ 897,703	\$ 214,361	\$ 718,808	\$ 35,465
Total Direct Expenses	\$ 1,922,295	\$ 1,951,567	\$ 29,272	\$ 1,708,013	\$ (214,282)
Indirect Expenses	\$ 1,717,923	\$ 1,593,677	\$ (124,246)	\$ 1,314,398	\$ (403,525)
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (A)	\$ 3,640,218	\$ 3,545,244	\$ (94,974)	\$ 3,022,411	\$ (617,807)
Change in Assets	\$ 147,684	\$ 75,795	\$ (71,889)	\$ 98,071	\$ (49,614)
Fixed Assets					
Depreciation	\$ (1,919)	\$ (1,919)	\$ -	\$ (1,439)	\$ 480
Computer & Software CapEx	-	-	-	-	-
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	119,202	(1,517)	(120,719)	22,052	(97,150)
Inc(Dec) in Fixed Assets (B)	\$ 117,283	\$ (3,436)	\$ (120,719)	\$ 20,613	\$ (96,670)
TOTAL BUDGET (=A+B)	\$ 3,757,501	\$ 3,541,807	\$ (215,693)	\$ 3,043,024	\$ (714,477)
FTEs	7.05	6.36	(0.69)	5.88	(1.18)

Administrative Services

Administrative Services (in whole dollars)						
	Direct Expenses and Fixed Assets			FTEs		
	2017 Budget	2018 Budget	Increase (Decrease)	2017 Budget	2018 Budget	Increase (Decrease)
General and Administrative	\$ 10,205,977	\$ 10,096,147	\$ (109,829)	16.92	15.98	(0.94)
Legal and Regulatory	3,292,379	2,914,377	(378,002)	11.28	10.34	(0.94)
Information Technology	12,480,846	11,266,626	(1,214,220)	23.27	22.33	(0.94)
Human Resources	1,608,583	1,704,459	95,876	2.82	2.82	-
Finance and Accounting	3,827,050	4,008,326	181,276	15.04	15.98	0.94
Total Administrative Services	\$ 31,414,834	\$ 29,989,934	\$ (1,424,899)	69.33	67.45	(1.88)

Program Scope and Functional Description

NERC's Administrative Services area includes the budget for all business and administrative functions of the organization, including (1) technical committees and member forums, (2) General and Administrative, which includes Board fees and expenses, the CEO, chief reliability officer (CRO) and support staff, communications, external affairs and governmental relations, and office rent, (3) Legal and Regulatory, (4) Information Technology, (5) Human Resources, (6) Finance and Accounting, and (7) other general administrative expenses necessary to support program area activities. These functions are necessary to the existence and functioning of the organization and support the performance of NERC's ERO statutory activities. The costs of the Administrative Services functions are allocated to the statutory programs as indirect expenses. The resource requirements and comparative budget information for each of these functions are described below.

Technical Committees and Members' Forum Program

While NERC management and staff will continue to interact with and support numerous reliability-related forums (e.g., the NATF and NAGF), NERC's 2018 budget does not contain specific funding for any forum activities.

General and Administrative

Background and Scope

The General and Administrative area is responsible for the administration and general management of the organization. Expenses allocated in this area include office rent, as well as personnel and related costs of the CEO, the CRO, the CEO's executive assistant, communications, external affairs, and government relations staff, and Board costs. The 0.94 reduction in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

The following table details the Board costs included in the total costs of the General and Administrative area:

Board of Trustee Expenses	Budget 2017	Budget 2018	Variance	
			2018 Budget v 2017 Budget	Variance %
Meeting and Travel Expenses				
Quarterly Board Meetings	\$ 244,000	\$ 185,000	\$ (59,000)	-24.2%
Trustee Travel	157,329	130,000	(27,329)	-17.4%
Total	\$ 394,000	\$ 315,000	\$ (79,000)	-20.1%
Professional Services				
Independent Trustee Fees	\$ 1,226,000	\$ 1,237,500	\$ 11,500	0.9%
Trustee Search Fees	100,000	100,000	-	0.0%
Total	\$ 1,326,000	\$ 1,337,500	\$ 11,500	0.9%
Total	\$ 1,720,000	\$ 1,652,500	\$ (67,500)	-3.9%

The reduction in Quarterly Board Meeting and Trustee Travel expenses is the result of more closely aligning the 2018 budget with historical actuals.

Legal and Regulatory

Background and Scope

The Legal and Regulatory department's workload is derived from the following key NERC program areas: Compliance Analysis, Certification and Registration, RASA, Reliability Risk Management, and Standards. In addition, the Legal and Regulatory department is also responsible for providing a wide range of legal support to the NERC management team regarding antitrust, corporate, commercial, insurance, contract, employment, real estate, copyright, tax, legislation, and other legal matters. The department also addresses legal and regulatory matters that arise in connection with the delegation agreements with the Regional Entities.

Resource Requirements

Personnel

The 0.94 reduction in FTEs area is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Professional Services

Outside law firms and consultants supporting this area are budgeted and tracked as Professional Services. The Professional Services budget for 2018 was \$192k lower than in 2017, primarily due to the transfer of those budget dollars to other departments in order to better align the responsibility associated with certain legal costs to those departments.

Information Technology

Background and Scope

NERC's IT department plan includes capital and operating expenses required to support, build, configure, and enhance applications that serve registered entities, Regional Entities, and NERC staff. The plan also includes work related to ERO Enterprise data analysis, as well as ongoing NERC internal operations.

The focus of the 2018 – 2020 budget is primarily on two programs designed to better support consistency and effectiveness across the ERO Enterprise in the areas of Standards, Compliance, and the associated

assessment of Reliability Risk. These programs are the Entity Registration program and the Compliance Monitoring and Enforcement Technology Program. Both programs are expected to continue from 2017 through to 2020. The Entity Registration application will consolidate core registration functions currently distributed across three applications into a single registration application. In similar fashion, the three applications used across NERC and the Regional Entities for enforcement processing will be replaced by a single common application that also provides additional compliance monitoring functionality. These investments will provide broad benefits across the ERO Enterprise in terms of the efficiency and effectiveness of operations and meeting reliability goals. Additionally, by working to provide more services to the registered and Regional Entities in terms of tools and systems, associated economies of scale will result in these initial investments providing increasing value across the ERO Enterprise in the years to come.

The 2019 – 2020 budget year projection also includes improvements to our public facing website, NERC.com.

The budget is broken down into four categories as follows:

1. **ERO Enterprise New Functionality** – Items listed in this category are those items designed to add, enhance, or improve capabilities for registered entities, Regional Entities, and NERC staff. This includes Entity Registration, the Compliance Monitoring and Enforcement Technology Program, NERC.com, and other legacy applications.
2. **ERO Enterprise Infrastructure & Support** – Items listed in this category are those infrastructure and support items required for applications used by registered entities, Regional Entities, and NERC staff. Items include Security and applications used by the ERO Enterprise such as The Events Analysis Management System (TEAMS), the Bulk Electric System Notification and Exception System tool (BESnet), the Standards Balloting System (SBS), the Reliability Coordinator Information System (RCIS), User Management and Records (UMR), and numerous other applications.
3. **NERC New Functionality** – There is no new functionality targeted until the 2019 budget year. 2018 – 2020 is heavily focused on improving the registered and Regional Entity experience.
4. **NERC Infrastructure & Support** – Items listed in this category are primarily those items required to maintain and run the internal office infrastructure, and support NERC staff operations. Items include server hardware and software licenses, network equipment, data and telecommunication circuits, and data storage, as well as office administrative applications (e.g., Microsoft Office) and user hardware such as laptops and peripherals.

A further discussion of each item is outlined below.

ERO Enterprise New Functionality

As noted above, this category is primarily those applications or systems designed to improve or add capability to registered entities, Regional Entities, and NERC staff. Over the past two years, IT has been successful at deploying a number of new applications and functionality for the ERO Enterprise that have now moved into support. In 2018 and beyond, IT will continue that trend with a heavy focus on Entity Registration and the Compliance Monitoring and Enforcement Technology Program.

- a. **Entity Registration** – The objective of the Entity Registration program is to take the core registration functions currently distributed across three systems -- OATI webCDMS, Guidance CITS, and Guidance CRATS -- and move those functions to a single, consolidated registration system. Doing so will allow for an expansion of current functionality, more control over the future

of the application, and ultimate reduction in costs through the long-term transfer of the remaining functions provided by those three systems into a single, common system.

This program will be implemented via multiple projects during the next four years. This first project in 2017 will address the registration, tracking, and management of Coordinated Functional Registrations (CFRs). Subsequent projects will address Joint Registration Organizations (JROs), tracking Coordinated Oversight of Multi-Region Registered Entities (MRREs), consolidating all existing entity registration functions into a single platform, adding validation of business relationships and functional responsibilities, and the capability to integrate reliability and compliance data for risk analysis purposes (supporting the creation of an entity's risk profile).

- b. **Compliance Monitoring and Enforcement Process Tools** – IT will work closely with the Regional Entities in 2017 and through the 2018 – 2020 budget cycle to evaluate and implement strategic investments in tools that replace the current three applications mentioned above with a single, consolidated Compliance Monitoring and Enforcement Process application. Items under consideration at this time include how Reliability Standards data is stored and maintained, as well as how best to support the various parts of the compliance monitoring and enforcement process (e.g., analysis of risk, development of implementation plans and audit schedules, actual compliance monitoring, and enforcement processing).

Funding for any capital investments in these areas will be subject to review and approval as part of the business plan and budget application in the year when such investments are proposed to be made. Prior to actual start of each project, the project will be reviewed through the enterprise information technology investment planning process to ensure the project's estimated costs and benefits are reasonable and justify investment. For more information on this process, see *Robust Planning for New Capital Projects* below.

ERO Enterprise Infrastructure & Support

This category primarily consists of items used by registered entities, Regional Entities, and NERC Staff. Information Technology has worked closely with the Regional Entities to design and configure a number of ERO Enterprise applications, with a bias toward using Commercial-off-the-Shelf (COTS) technology whenever possible. Infrastructure and support for these COTS tools (such as SharePoint and the Dynamics xRM platform), as well as custom built applications developed in the past, require ongoing investment to maintain continuous operations. For many applications and systems, this includes the cost of maintaining development, quality assurance, and staging and production environments, which are required to ensure the security and operational integrity and stability of the multiple applications supported for the ERO Enterprise. These applications and systems are monitored, tested (including penetration and vulnerability testing), and maintained in a manner as to ensure the highest level of integrity, security, and availability to the roughly 4,000 users across North America.

IT continues to place emphasis on ensuring the environment is configured in a manner consistent with enterprise best practices, ensuring the security and integrity of the environment while allowing ERO Enterprise users to obtain the information and resources required to perform various analyses. Ongoing support for applications such as TEAMS, Misoperations Information Data Analysis System (MIDAS), SBS, the Reliability Analysis Data System (RADS), in addition to numerous legacy ERO Enterprise products, make up this portion of the IT budget.

NERC New Functionality

There is no new functionality planned for the NERC environment in the 2018 budget year. In 2019 funding is projected for implementation of a separate document management application for the E-ISAC.

NERC Infrastructure & Support

As previously noted, NERC Infrastructure & Support are those items required to maintain and support the internal infrastructure for NERC staff. Items such as file servers, network equipment, storage, Microsoft Office (Word, Excel, PowerPoint, Email, SharePoint, etc.), along with security and telecommunications, are required to ensure staff have the necessary tools and technology to perform their daily operational functions. Emphasis in the 2018 – 2020 planning cycle will continue to be placed on optimizing the amount of effort placed on NERC infrastructure and support in order to minimize spend on internal office steady state operations, allowing a larger portion of IT resources to focus on new ERO Enterprise functionality, as well as ERO Enterprise infrastructure and support. As a result of this effort, the 2018 NERC Infrastructure & Support is expected to be less than 2017. Examples of items included in internal operations are outlined below:

- a. **Compliance Reporting and Tracking System (CRATS)** – This compliance database is used to track violations, mitigation plans, and reporting required by NERC as the certified ERO. The compliance database has additional modules, such as the Standards, Technical Feasibility Exceptions (TFEs), and Registration module, which contains a list of all registered entities. Funding requirements include ongoing maintenance for the CRATS compliance tools.
- b. **Meeting Manager, ERO Membership, Central Repository of Curtailment Events** – NERC maintains a number of legacy applications. Many of the legacy applications were developed and implemented five to ten years ago and are unable to benefit from contemporary application development. Some of these applications may have to be completely rewritten, or moved to the xRM application platform, as IT was able to do with Application Broker, NERC MyAccount, and User Management Program (UMP) in 2016. Funding in 2018 is required for ongoing maintenance and enhancements until the applications can be rewritten or moved to the xRM platform or, in some cases, potentially divested or transferred to industry support.
- c. **Quarterly Penetration and Vulnerability Testing All NERC Networks and Systems** – Expert consulting services to provide ongoing intrusion detection and vulnerability testing of the NERC public website and NERC’s network, applications, and systems, is an essential requirement of ongoing operations. NERC is subject to frequent intrusion attempts where external parties try to gain access to its systems and infrastructure. Any vulnerability identified is documented and provided to NERC IT for rapid remediation.
- d. **NERC Security Program** – NERC’s IT department performs a number of technology initiatives to ensure the security of the network and infrastructure. However, in order to continually improve security, a more holistic approach is required that implements technology improvements and constructs an overarching security program to ensure all aspects of security have been considered, including information classification, review of retention policies, and enforcement of security guidelines. Security remains an area of focus during the 2018 – 2020 budget cycle.

Robust Planning for New Capital Projects

The company has adopted an enterprise information technology investment planning methodology that ensures only projects with compelling and approved business cases are funded. The approval process uses four approval gates:

- A Business Unit Sponsor approval gate;
- A NERC VP/CTO approval gate;
- An ERO Technology Leadership Team (TLT) (comprised of the NERC CEO and two Regional Entity CEOs) approval gate; and
- The full ERO EMG (CEOs of NERC and each Regional Entities) approval gate.

This gated process provides the required rigor and discipline to ensure that only high value enterprise IT investments are pursued. The company will continue to use this process for the 2018 through 2020 budget planning cycle.

TEAMS, RADS, and the document management program are three examples of applications or programs for which investments were approved in 2016. For each of these three projects, NERC's planning process and associated approval gates resulted in thorough review of both costs and benefits of the proposed technology project prior to moving forward with the project. The benefits of a given project are evaluated within the context of six identified value domains:

- Reducing Reliability Risk (the project is expected to address one or more of identified risks to the reliability of the BES);
- Increasing Capability (the project is expected to make possible activities or analysis that are not currently possible given existing process, resource, or system limitations);
- Reducing Corporate Risk (the project is expected to address one or more corporate risks, such as reputational risk, contract risk, or litigation risk);
- Increasing Work Quality (the project is expected reduce the probability of errors or provide information of better quality);
- Increasing Productivity (the project is expected to increase the amount of work that can be completed within the same amount of time); and
- Reducing Cost (the project is expected to provide a net reduction in costs related to the area(s) being addressed by the project)

As the planning process has matured, NERC has also begun to consider potential benefits to the Regional Entities and registered entities when considering potential IT investments. For example, Entity Registration Project 1 addresses the submission, processing, and updating of Coordinated Functional Registrations (CFRs). In the business case brought before the ERO TLT in March and April of 2017, NERC included estimates of productivity gains in terms of NERC staff, Regional Entity staff, and registered entity staff. NERC estimated that across the ERO Enterprise, in the first year of operation:

- 23 Regional Entity Registration Full Time Equivalents (FTEs)³⁴ would each increase productivity by roughly 30 hours per year;
- Another 23 Regional Entity FTEs would each increase productivity by roughly 3 hours per year;
- 3 NERC FTEs would each increase productivity by roughly 15 hours per year; and
- 416 Registered Entity FTEs currently involved in the negotiation and submission of CFRs would each increase productivity by roughly 6 hours per year.

Benefits would increase slightly in the following years as users become more familiar with the system. These gains represent increased productivity for those FTEs, allowing them to focus on higher level tasks instead of managing their submission manually via email chains and multiple telephone calls. The business case also identified benefits in terms of Reducing Reliability Risk, Increasing Capability, Reducing Corporate Risk, and Increasing Work Quality.

³⁴ The review, processing, and maintenance of a CFR may involve compliance staff, registration staff, enforcement staff, legal staff, etc. Rather than specifically itemizing each of these elements as fractional FTEs, for the purposes of convenience, an assumption was used that aggregating these elements into a single FTE number per class of impacted entities would achieve roughly equivalent results.

The same planning methodology will be used during 2017 through 2020 for Entity Registration and the Compliance Monitoring and Enforcement Technology Program application. As the planning process continues to develop and mature, NERC will continue to expand incorporation of regional staffing and budget impacts into its business case analysis, as well as identifying economies of scale, efficiency improvements, and enhancements to reliability through IT investment.

Resource Requirements

Personnel

The 0.94 reduction in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Contractor Expenses

The 2018 budgeted amounts are set forth in *Exhibit C – Contractor and Consulting Costs*, with a comparison to 2017 budgeted amounts. The \$189k decrease in the 2018 budget compared to 2017 is primarily due to the transfer of budgeted funds from contracts and consultants to cover needs in fixed assets (capital) additions.

IT Office Costs

The below table shows the major categories of IT Office Costs, and a short description of certain categories follows thereafter. Explanations for the major areas of increase from the 2017 Budget to the 2018 Budget are provided in Table B-8 in Section B.

Office Costs	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Telephone	\$ 230,000	\$ 162,100	\$ (67,900)	-29.5%
Telephone Answering Service	2,500	-	(2,500)	-100.0%
Internet	358,920	358,920	-	0.0%
Computers	25,000	-	(25,000)	-100.0%
Computer Supplies	98,100	98,100	-	0.0%
Maintenance and Service Agreements	1,706,088	1,606,080	(100,008)	-5.9%
Software	59,000	166,950	107,950	183.0%
Subscription and Publications	108,300	126,200	17,900	16.5%
Dues	2,500	2,500	-	0.0%
Express Shipping	5,000	7,500	2,500	50.0%
Audio/Visual Lease	-	494,988	494,988	100.0%
Hardware Lease	-	145,348	145,348	100.0%
Total	\$ 2,595,408	\$ 3,168,686	\$ 573,278	22.1%

Telephone

Telephone costs are items associated with cellular phone, mobile laptop cellular air card, and Session Internet Protocol (SIP) data circuits.

Internet

Internet expense is comprised of data circuits and redundant capability in the event of primary service provider failure.

Computer Supplies and Maintenance and Service Agreements

Computer supplies are expense items required for infrastructure support. Maintenance and service agreements are required to support internal and external access to routers, switches, firewalls, intrusion

protection, file servers, audiovisual equipment, storage area networks, data backup services, network and security monitoring, co-location data center services, video conferencing, digital certificates, and development and virtualization software. Service agreements related to the co-location data center, offsite backup of data, conference calling, and network and security monitoring comprise a large portion of the maintenance and service agreements budget.

Software

Tools such as Adobe Creativity Suite, remote support tools, and various other IT support tools are included under this line item. The tools are primarily used for NERC infrastructure purposes to support and manage the application, server, and network environment.

Audio/Visual and Hardware Leases

These items consist of audio visual equipment, computers, laptops, servers, and switches that were leased, in lieu of purchasing, beginning in January 2017. Whereas a portion of these items were included in fixed assets in the 2017 budget, they are all included in Office Costs in the 2018 budget.

Fixed Asset (Capital) Expenses

The following table presents a summary of NERC’s IT 2018 fixed asset (capital) budget³⁵ compared to the 2017 budget:

IT Capital Budget	Budget 2017	Budget 2018	Variance 2018 Budget v 2017	
			Budget	Variance %
ERO Application Development*	\$ 700,000	\$ -	\$ (700,000)	-100.0%
Document Management Program	335,000	-	(335,000)	-100.0%
Hardware (storage, servers)	891,000	705,000	(186,000)	-20.9%
Other Equipment	885,000	370,000	(515,000)	-58.2%
Disaster Recovery	150,000	100,000	(50,000)	-33.3%
NERC Software Licenses	311,000	301,000	(10,000)	-3.2%
Total	\$ 3,272,000	\$ 1,476,000	\$ (1,796,000)	-54.9%

* NERC's total 2018 ERO Application Development budget is \$2,148,000 and includes \$1,548,000 budgeted in the Compliance Enforcement department for the CMEP Tool and \$600,000 budgeted in the Compliance Analysis, Organization Registration and Certification department for the Entity Registration Tool.

As in prior years, the goal of the fixed assets (capital) program for the 2018–2020 planning period is to provide access, visibility, and analysis of data from many different sources. This requires ongoing investments in hardware, software, and associated tools. The overarching theme is to securely gather, analyze, and maintain data across the ERO Enterprise to support ERO operations. Adding the capability to centralize and mine data—in addition to foundational elements such as the Microsoft xRM application, SharePoint 2013, and disaster recovery and enhanced security—sets the stage for vastly improved reporting and business intelligence. It also allows the capability for collaboration and sharing of information vital to the ERO’s mission.

³⁵ NERC’s total 2018 fixed asset (capital) budget is \$3,676,000 and includes \$2,100,000 for ERO Application Development, as discussed in the note below the table, as well as \$100k budgeted in CRISP for other costs.

In addition to the investments described in the preceding paragraph to support efficiency and consistency across the Enterprise, the 2018 budget also includes the cost of, network assets, software, servers, laptops, and other hardware to support daily operations.

Human Resources

Background and Scope

Human Resources manages all of NERC's human resources functions, including staffing, benefits administration, employee relations, performance and compensation management, and training and development. Management has implemented a robust, objective, and auditable performance management system to track corporate and individual performance against pre-established goals, objectives, and measures. Each year NERC continues to refine and improve this system.

Leadership, Management, and Professional and Administrative Staff Training and Development

As part of the ERO Enterprise's ongoing efforts to engage and retain highly qualified talent with the leadership and technical skills to support its mission, NERC's executives, managers, and professional and support staff participate in ongoing training and development to improve competencies critical to success and succession planning for critical roles. As such, NERC will continue to invest in learning opportunities in several areas. First, Human Resources will continue to host and optimize an e-learning platform, SkillSoft, to provide staff resources for improving soft and technical skills. Second, Human Resources will provide broad-based staff development training through real-world access via tours of and training on control centers, electric substations, and power generation plants. Finally, staff will have access to additional education, including but not limited to degree-oriented university education, pursuit of specialized certifications, and other in-house and external training that provides essential competencies and skills development that will lead to improved organization performance.

Compensation Strategy

NERC relies on data and advisory from multiple perspectives to hire and retain the necessary technical and other staff to support the goals and objectives in the company's strategic plan. Under the mandate of the Corporate Governance and Human Resources Committee (CGHRC), the company performs periodic market compensation studies to benchmark the pay practices of similar organizations and roles for which NERC hires. To ensure that NERC is able to attract the best-qualified staff to meet our mission, the CGHRC recommended a compensation philosophy of paying between the 50th and 75th percentiles, which has historically enabled the company to hire appropriate skills at prevailing market rates. Management will continue to closely monitor market conditions through periodic compensation studies and real-time pay trends of our candidate pool and expect that our pay philosophy will sustain the ability to hire qualified talent consistent with appropriate market levels.

Compensation Consulting

Consultants are periodically retained to examine appropriate compensation based on current market data. This ensures that decisions affecting compensation are made in light of the current market climate and that qualified employees are attracted and retained within a defined total remuneration range. NERC also periodically retains compensation subject matter experts to perform periodic assessments of the Board compensation model to ensure alignment with market practices.

Surveys

NERC periodically retains a vendor to conduct Board and committee effectiveness surveys to identify improvement opportunities. Human Resources will also launch additional surveys as appropriate, based on business needs, which may include periodic internal climate surveys.

Succession Planning

Minimizing disruption of knowledge, skill, and experience of key staff is critical to the company's success. Human Resource works with senior management to identify essential roles and develop strategies to build succession and contingency plans for any loss of staff.

Human Resources Products and Services Automation

Human Resource will continue to operate, maintain, and investigate investment in additional electronic platforms for Human Resource support services that reduce administrative burden and improve employee access to tools and information.

Resource Requirements

Personnel

There is no change in FTEs in 2018 compared to 2017.

Contractor Expenses

Contractor and consultant expenses are set forth in additional detail in *Exhibit C – Contractor and Consulting Costs*. The increase over 2017 is primarily due to increased investments for additional leadership and staff training, as well as funding for the bi-annual compensation study.

Miscellaneous Expenses

Miscellaneous expenses include community responsibility and employee engagement, the year-end employee appreciation event, and employee rewards and recognition.

Finance and Accounting

Background and Scope

NERC's Finance and Accounting department manages all finance and accounting functions, including employee payroll, 401(k), 457(b), and 457(f) plans, travel and expense reporting, monthly financial reporting, sales and use tax, meeting and events planning and services, insurance, internal auditing, and facilities management. This area also holds primary responsibility for the development of the annual business plan and budget, as well as NERC's ERO risk management framework. Over the past several years, NERC's Finance and Accounting department implemented additional policies, procedures, and controls governing day-to-day practices including contract and personnel procurements, meetings, conference planning and travel, expense reimbursement, and back office systems and procedures. The department will continue to refine, improve and, where necessary, implement additional procedures and controls.

Resource Requirements

Personnel

The 0.94 reduction in FTEs is the result of resource allocations that began in 2016 and will continue throughout 2017 to realign staff with current needs.

Contractor Expenses

Outside contractor and consulting support, budgeted at \$427k, represents a decrease compared to the 2017 budget. These costs are primarily for outside professional support for auditors to support various risk management and internal control and audit initiatives, as well as to provide finance and accounting support.

Section A – 2018 Business Plan and Budget Program Area and Department Detail

Statement of Activities and Fixed Assets Expenditures					
2017 Budget & Projection, and 2018 Budget					
ADMINISTRATIVE SERVICES					
	2017	2017	Variance	2018	Variance
	Budget	Projection	2017 Projection	Budget	2018 Budget
			v 2017 Budget		v 2017 Budget
			Over(Under)		Over(Under)
Funding					
ERO Funding					
NERC Assessments	\$ 519,083	\$ 519,083	\$ (0)	\$ (231,393)	\$ (750,476)
Assessment Stabilization Reserve - Penalties	-	-	-	-	-
Total NERC Funding	\$ 519,083	\$ 519,083	\$ (0)	\$ (231,393)	\$ (750,476)
Third-Party Funding	\$ -	\$ -	\$ -	\$ -	\$ -
Testing Fees	-	-	-	-	-
Services & Software	-	-	-	-	-
Workshops	-	-	-	-	-
Interest	-	-	-	-	-
Miscellaneous	-	-	-	-	-
Total Funding	\$ 519,083	\$ 519,083	\$ (0)	\$ (231,393)	\$ (750,476)
Expenses					
Personnel Expenses					
Salaries	\$ 11,858,590	\$ 11,649,901	\$ (208,688)	\$ 11,625,482	\$ (233,108)
Payroll Taxes	669,299	647,536	(21,763)	651,076	(18,223)
Benefits	1,333,443	1,430,816	97,373	1,443,502	110,059
Retirement Costs	1,073,642	993,093	(80,549)	1,010,928	(62,714)
Total Personnel Expenses	\$ 14,934,974	\$ 14,721,347	\$ (213,627)	\$ 14,730,988	\$ (203,986)
Meeting Expenses					
Meetings	\$ 350,000	\$ 350,000	\$ (0)	\$ 375,500	\$ 25,500
Travel	653,945	702,728	48,783	570,000	(83,945)
Conference Calls	19,307	47,249	27,943	119,600	100,294
Total Meeting Expenses	\$ 1,023,251	\$ 1,099,977	\$ 76,726	\$ 1,065,100	\$ 41,849
Operating Expenses					
Consultants & Contracts	\$ 3,359,787	\$ 3,472,587	\$ 112,800	\$ 3,290,966	\$ (68,821)
Office Rent	3,117,009	3,124,992	7,983	3,091,804	(25,205)
Office Costs	3,275,952	3,658,559	382,607	3,874,198	598,246
Professional Services	2,293,135	2,246,470	(46,665)	2,287,500	(5,635)
Miscellaneous	32,000	48,463	16,463	34,500	2,500
Depreciation	1,233,650	1,789,158	555,508	981,159	(252,491)
Total Operating Expenses	\$ 13,311,534	\$ 14,340,230	\$ 1,028,696	\$ 13,560,127	\$ 248,594
Total Direct Expenses	\$ 29,269,759	\$ 30,161,554	\$ 891,795	\$ 29,356,216	\$ 86,457
Indirect Expenses	\$ (29,376,484)	\$ (30,277,351)	\$ (900,867)	\$ (29,495,094)	\$ (118,610)
Other Non-Operating Expenses	\$ 106,725	\$ 115,797	\$ 9,072	\$ 138,878	\$ 32,153
Total Expenses (A)	\$ -	\$ (0)	\$ (0)	\$ 0	\$ 0
Change in Assets	\$ 519,083	\$ 519,083	\$ (0)	\$ (231,393)	\$ (750,476)
Fixed Assets					
Depreciation	\$ (1,233,650)	\$ (1,789,158)	\$ (555,508)	\$ (981,159)	\$ 252,491
Computer & Software CapEx	1,472,000	592,033	(879,967)	301,000	(1,171,000)
Furniture & Fixtures CapEx	-	-	-	-	-
Equipment CapEx	1,800,000	1,168,295	(631,705)	1,175,000	(625,000)
Leasehold Improvements	-	-	-	-	-
Allocation of Fixed Assets	(2,038,350)	28,830	2,067,180	(494,841)	1,543,509
Inc(Dec) in Fixed Assets (B)	\$ -	\$ 0	\$ -	\$ 0	\$ 0
TOTAL BUDGET (=A+B)	\$ -	\$ (0)	\$ (0)	\$ 0	\$ 0
FTEs	69.33	68.41	(0.92)	67.45	(1.88)

Section B – Supplemental Financial Information

Breakdown by Statement of Activity Sections

The following detailed schedules support the consolidated Statement of Activities. All significant variances were described by program area in the preceding pages.

Table B-1 – Operating Reserve and Assessment Analysis

Operating Reserve and Assessment Analysis						
Statutory						
	Total Reserves	Future Obligation Reserve ¹	Operating Contingency Reserve	System Operator Certification Reserve	CRISP Reserve	Assessment Stabilization Reserve
Beginning Operating Reserves Balance - 1/1/2017	\$ 8,782,011	\$ 2,875,467	\$ 2,307,531	\$ 828,013	\$ 500,000	\$ 2,271,000
Generation or (Use) from 2017 Operations						
From 2017 budgeted operations	\$ 79,336	\$ -	\$ 284,507	\$ (205,171)	\$ -	\$ -
From 2017 approved addition/(use) of reserves	(1,363)	84,623	(85,986)	-	-	-
Proceeds from financing activities (non-current portion only) ²	966,667	-	966,667	-	-	-
Debt service ³	(719,522)	-	(719,522)	-	-	-
Other adjustments to reserves ⁴	(1,128,397)	(727,165)	198,768	-	-	(600,000)
Projected Operating Reserves - 12/31/17	\$ 7,978,733	\$ 2,232,925	\$ 2,951,965	\$ 622,842	\$ 500,000	\$ 1,671,000
Required Working Capital and Operating Reserves - 12/31/18	\$ 7,475,734	\$ 1,752,468	\$ 2,951,965	\$ 700,300	\$ 500,000	\$ 1,571,000
Adjustment in funding to achieve required reserve balance	(402,999)	(480,457)	-	77,458	-	-
Penalty sanctions received 7/1/2016 - 6/30/2017 (See Table B-2)	500,000	-	-	-	-	500,000
Less: Assessment Stabilization Reserve Release - Penalties	(600,000)	-	-	-	-	(600,000)
Total Adjustments to Reserves	\$ (502,999)	\$ (480,457)	\$ -	\$ 77,458	\$ -	\$ (100,000)
Assessment Reconciliation						
2018 Expenses and Capital Expenditures	\$73,135,156					
Less: Assessment Stabilization Reserve Release - Penalties	(600,000)					
Adjustment in funding to achieve required reserve balance	77,458					
Less: Other Funding Sources	(9,444,253)					
Less: Proceeds from financing activities (non-current only)	(1,432,000)					
Plus: Debt service	1,200,607					
2018 NERC Assessment	\$62,936,968					

¹As further explained in the discussion of the Working Capital Reserve amount in Exhibit E, the Future Obligations Reserve offsets future, non-current liabilities. The calculation of Working Capital and Operating Reserve balances per 2016 audited financials and as projected for 2017 and 2018 is included with the Statements of Financial Position that follow in *Section D - Supplemental Financial Statements*.

²Proceeds from financing activities amount is equal to two-thirds of the amount financed or to be financed in the year. See Exhibit D.

³Debt Service amount is equal to Annual Payments for Debt Service less Interest Expense. See Exhibit D.

⁴Represents transactions recorded only on the Statement of Financial Position (balance sheet) and do not impact the Statement of Activities (income statement), including recording of capitalized leases, amortization of future obligations, and funding the 457f plan.

Table B-2 – Penalties

Penalty Sanctions

The *NERC Policy – Accounting, Financial Statement and Budgetary Treatment of Penalties Imposed and Received for Violations of Reliability Standard*, as well as Section 1107.2 of the ROP, specify that Penalty monies received by NERC during the 12 months ended June 30 are to be used in the subsequent budget year to offset assessments. In 2015, the NERC Board approved an updated Working Capital and Operating Reserves Policy that was approved by FERC. This updated policy allows NERC, with Board and FERC approval pursuant to Section 1107.4 of the ROP, to place Penalty funds into a new Assessment Stabilization Reserve for use in future years to offset assessments. For the 2018 budget, NERC proposes, subject to Commission approval, to deposit \$500,000 of Penalty funds received during the 12 months ended June 30, 2017 into the Assessment Stabilization Reserve, resulting in a balance of \$2,171,000 on January 1, 2018. NERC further proposes that \$600,000 of those funds be used to offset assessments in the 2018 budget and that the balance held in the Assessment Stabilization Reserve be used for future assessment offsets.

All Penalties received during the 12 month period ended June 30, 2017 are detailed below, including the amount and date received.

Allocation Method

Penalty sanctions released from the Asset Stabilization Reserve to offset 2018 assessments have been allocated to the following statutory programs to reduce assessments: 1) Reliability Standards, 2) Compliance Assurance, 3) Compliance Analysis, Organization Registration and Certification, 4) Compliance Enforcement, 5) RASA, 6) Situation Awareness, 7) Event Analysis, 8) Performance Analysis, 9) E-ISAC (including CRISP), and 10) Training and Education. Penalty sanctions are allocated based on the number of FTEs in the program divided by the aggregate total FTEs in the programs receiving the allocation.

Penalty Sanctions	Date Received	Amount Received
Penalties received between 7/1/2016 and 6/30/2017		
	May-17	\$ 500,000
		<u>\$ 500,000</u>
Penalties received prior to 6/30/2016, held in the assessment stabilization reserve		<u>\$ 1,671,000</u>
Total penalties available on 1/1/2018 to offset assessments		<u>\$ 2,171,000</u>
Adjustments		
Total penalties released to offset assessments in the 2018 Budget		<u>\$ (600,000)</u>
Total penalties held in Assessment Stabilization Reserve 12/31/2018		<u>\$ 1,571,000</u>

Table B-3 – Outside Funding

Outside Funding Breakdown By Program (Excludes Penalty Sanction)	Budget 2017	Budget 2018	Variance 2018 Budget v 2017 Budget
Reliability Standards			
Workshops	\$ 105,000	\$ 50,000	\$ (55,000)
Interest Income Allocation	427	10,717	10,291
Total	\$ 105,427	\$ 60,717	\$ (44,709)
Compliance Analysis, Registration and Certification			
Interest Income Allocation	\$ 187	\$ 6,495	\$ 6,308
Total	\$ 187	\$ 6,495	\$ 6,308
Compliance Assurance			
Interest Income Allocation	\$ 386	\$ 13,316	\$ 12,930
Total	\$ 386	\$ 13,316	\$ 12,930
Compliance Enforcement			
Interest Income Allocation	\$ 327	\$ 8,444	\$ 8,117
Total	\$ 327	\$ 8,444	\$ 8,117
Reliability Assessment and System Analysis			
Services and Software	\$ 50,000	\$ -	\$ (50,000)
Workshops	15,000	25,000	10,000
Interest Income Allocation	351	9,743	9,392
Total	\$ 65,351	\$ 34,743	\$ (30,608)
Performance Analysis			
Services and Software	\$ -	\$ 50,000	\$ 50,000
Interest Income Allocation	234	6,495	6,261
Total	\$ 234	\$ 56,495	\$ 56,261
Training, Education, and Personnel Certification			
Testing Fees	\$ 671,900	\$ 540,000	\$ (131,900)
Certificate Renewals	650,000	650,000	-
Continuing Education Fees	600,000	600,000	-
Interest Income Allocation	175	4,060	3,884
Total	\$ 1,922,075	\$ 1,794,060	\$ (128,016)
Event Analysis			
Workshops	\$ 40,000	\$ 40,000	\$ (0)
Interest Income Allocation	281	7,794	7,514
Total	\$ 40,281	\$ 47,794	\$ 7,514
Situation Awareness			
Interest Income Allocation	\$ 140	\$ 3,897	\$ 3,757
Total	\$ 140	\$ 3,897	\$ 3,757
E-ISAC			
Third Party Funding (CRISP)	\$ 6,990,447	\$ 7,324,253	\$ 333,806
Workshops	70,000	70,000	(0)
Interest Income Allocation	491	24,038	23,546
Total	\$ 7,060,938	\$ 7,418,290	\$ 357,352
Grand Total	\$ 9,195,347	\$ 9,444,253	\$ 248,906

- Workshops – The \$45k decrease is due to one less Reliability Standards workshop being held in 2018, which is partially offset by an increase in RASA modeling workshop fees that are based on 2016 actuals.
- Interest Income Allocation – The \$92k increase is the result of higher anticipated interest rates in 2018.
- Services and Software – The net change is \$0, since \$50k for PcGAR software was incorrectly budgeted in RASA in 2017 and is being reclassified to Performance Analysis in 2018.
- Testing Fees – The \$132k decrease is due to a reduction in the numbers of tests to be taken in 2018.
- Third Party Funding (CRISP) – The \$334k increase is due to the increase in NERC costs, which are funded equally by participants in CRISP and through assessments.

Table B-4 – Personnel

Personnel	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Salaries	\$ 30,073,438	\$ 31,791,098	\$ 1,717,659	5.7%
Payroll Taxes	1,847,130	1,949,557	102,426	5.5%
Benefits	3,643,806	3,988,886	345,080	9.5%
Retirement	3,076,956	3,239,565	162,608	5.3%
Total	\$ 38,641,331	\$ 40,969,105	\$ 2,327,774	6.02%
FTEs	189.88	199.28	9.40	5.0%
Cost per FTE				
Salaries	\$ 158,381	\$ 159,530	\$ 1,149	0.7%
Payroll Taxes	9,728	9,783	55	0.6%
Benefits	19,190	20,016	826	4.3%
Retirement	16,205	16,256	52	0.3%
Total	\$ 203,504	\$ 205,586	\$ 2,082	1.02%

Below is some additional information on the components of personnel expense:

- Salaries - Total Salaries expense is comprised of base salaries, incentive compensation, deferred compensation, employment agency fees, and temporary office expenses. The 2018 budget for base salaries assumes a 3% increase over actual 2017 base salaries and is inclusive of market adjustments and promotions. The 2018 budget for incentive compensation is based on historical actuals and is comparable to prior years. The 2018 budgets for deferred compensation, employment agency fees, and temporary office expenses are generally consistent with 2017.
- Benefits are budgeted to increase 9.5% based on a 5% increase in health and dental premiums, as well as an increase in training expenses to support staff development.
- There have been no changes to NERC’s retirement plans.

Table B-5 – Meetings

Meetings	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Meetings	\$ 1,071,500	\$ 1,071,500	\$ (0)	0.0%
Travel	2,203,786	2,204,000	214	0.0%
Conference Calls	97,600	119,600	22,000	22.5%
Total	\$ 3,372,886	\$ 3,395,100	\$ 22,214	0.7%

- The \$22k increase in Conference Calls reflects an adjustment for WebEx expenses based on historical usage.

Table B-6 – Consultants and Contracts

NOTE: This table has been replaced by Exhibit C – Contractor and Consulting Costs

Table B-7 – Rent

Office Rent	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Office Rent	\$ 2,838,144	\$ 2,819,554	\$ (18,590)	-0.7%
Maintenance	278,866	272,250	(6,616)	-2.4%
Total	\$ 3,117,009	\$ 3,091,804	\$ (25,205)	-0.8%

Table B-8 – Office Costs

Office Costs	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Telephone	\$ 539,737	\$ 422,387	\$ (117,350)	-21.7%
Telephone Answering Service	2,500	2,750	250	10.0%
Internet	383,366	383,966	600	0.2%
Office Supplies	194,000	190,750	(3,250)	-1.7%
Computer Supplies & Maintenance	-	-	-	0.0%
Computers	25,000	-	(25,000)	-100.0%
Computer Supplies	101,400	106,100	4,700	4.6%
Maintenance and Service Agreements	2,426,139	2,102,966	(323,173)	-13.3%
Software	122,500	851,976	729,476	595.5%
Network Supplies	-	-	-	0.0%
Subscription and Publications	180,460	194,970	14,510	8.0%
Dues	49,316	66,911	17,595	35.7%
Postage	16,221	15,540	(681)	-4.2%
Express Shipping	28,216	26,992	(1,224)	-4.3%
Copying	110,123	115,842	5,719	5.2%
Audio/Visual Lease	-	494,988	494,988	100.0%
Hardware Lease	-	145,348	145,348	100.0%
Reports	362	-	(362)	-100.0%
Stationary/Forms	2,500	-	(2,500)	-100.0%
Equipment Repair/Service Contracts	75,000	132,497	57,497	76.7%
Bank Charges	25,000	25,000	(0)	0.0%
Merchant Card Fees	77,500	86,100	8,600	11.1%
Total	\$ 4,359,340	\$ 5,365,084	\$ 1,005,744	23.1%

- Telephone – The \$117k decrease is due to a change in our long-distance provider.
- Computers – The \$25k decrease is due to the decision to lease desktop computers in lieu of purchasing them in 2018.
- Maintenance and Service Agreements – The \$323k decrease is primarily the result of the following:
 - \$100k decrease in Compliance Assurance due the elimination of an audit tool;
 - \$100k decrease in Finance and Accounting department due to the reclass of its budgeting and financial reporting software from this account to the Software account; and
 - \$100k decrease in Information Technology department due to the reclass of \$214k combined to the Audio/Visual Lease and Hardware Lease accounts, which was partially offset by increases in various maintenance and service agreements.
- Software – The \$729k increase is largely the result of the following:
 - \$108k combined increase for new analytic data software for the RASA department and budgeting and financial reporting software for the Finance and Accounting department that were both reclassified from the Maintenance and Service Agreement account to this account; and

- \$500k for new technology tools related to the E-ISAC strategy.
- \$110k increase in Information Technology department due to the reclass of various tools from other accounts.
- Subscriptions and Publications – The \$15k increase is due to higher fees for a research and advisory subscription in the Information Technology department
- Dues – The \$17k increase primarily results from a new membership in an organization that allows NERC to partner with other entities in addressing strategic issues facing the electric industry.
- Audio/Visual Lease – The \$495k increase is the result of the reclass of costs related to the audio/visual equipment of \$300k from fixed assets and \$195k from the Maintenance and Service Agreements account.
- Hardware Lease – The \$145k increase is due to the reclass of \$126k from fixed assets and \$19k from the Maintenance and Service Agreements account due to the decision to lease certain hardware in lieu of purchasing it.
- Equipment Repair/Service Contracts – \$57k increase due to building security and HVAC needs in 2018.

Table B-9 – Professional Services

Professional Services	Budget 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Independent Trustee Fees	\$ 1,226,000	\$ 1,237,500	\$ 11,500	0.9%
Trustee Search Fees	100,000	100,000	-	0.0%
Outside Legal	515,000	595,500	80,500	15.6%
Lobbying	60,000	72,000	12,000	20.0%
Accounting and Auditing Fees	159,135	128,000	(31,135)	-19.6%
Insurance Commercial	230,000	231,000	1,000	0.4%
Outside Services	178,000	173,500	(4,500)	-2.5%
Total	\$ 2,468,135	\$ 2,537,500	\$ 69,365	2.8%

- Outside Legal – increase primarily due to the addition of \$75k for legal costs related to the E-ISAC strategy.
- Lobbying – higher due to an increase in the retainer of the firm that NERC uses. This expense is primarily related to NERC’s monitoring of regulatory and legislative issues and responding to information requests related to these activities.
- Accounting and Auditing Fees – decreased based on historical actual information.

Table B-10 – Miscellaneous

Miscellaneous Expenses	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Miscellaneous Expense	\$ 6,500	\$ 7,000	\$ 500	7.7%
Employee Rewards and Recognition*	25,500	28,000	2,500	9.8%
Community Responsibility & Employee Engagement	5,000	4,500	(500)	-10.0%
Total	\$ 37,000	\$ 39,500	\$ 2,500	6.8%

* Includes costs associated with the year-end employee recognition event

Table B-11 – Other Non-Operating Expenses

Other Non-Operating Expenses	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Property Tax Expense	\$ 50,000	\$ 50,000	\$ -	0.0%
Interest Expense	56,725	88,878	32,153	56.7%
Total	\$ 106,725	\$ 138,878	\$ 32,153	30.1%

Budgeted interest expense is calculated based on expected draws on the capital financing loan. Refer to *Exhibit D – Capital Financing* on page 142 for more detailed information related to debt repayment and the interest expense calculation.

Table B-12 – Fixed Assets

Fixed Assets	Budget		Variance	
	2017	2018	2018 Budget v 2017 Budget	Variance %
Depreciation	\$ (1,691,457)	\$ (1,594,299)	\$ 97,158	-5.7%
Computer & Software CapEx	2,572,000	2,549,000	(23,000)	-0.9%
Furniture & Fixtures CapEx	-	-	-	0.0%
Equipment CapEx	1,800,000	1,175,000	(625,000)	-34.7%
Leasehold Improvements	-	150,000	150,000	100.0%
Total	\$ 2,680,543	\$ 2,279,701	\$ (400,842)	-15.0%

As discussed in the *Executive Summary* on page 15 and in the *Information Technology* section of Section A beginning on page 77, expenditures for fixed assets, excluding the reversal of Depreciation expense, are budgeted to be \$498k lower in 2018 compared to 2017. This decrease is primarily the result of leasing audio visual and certain computer equipment, resulting in a reduction of Fixed Assets and an increase in Office Costs in the 2018 budget. There is also \$150,000 included in the 2018 budget for leasehold improvements related to the long-term E-ISAC strategy.

Table B-13 – 2019-2020 Projections

NOTE: Refer to the Executive Summary section on page 22

Section C – Non-Statutory Activity

NERC has no non-statutory activities.

Section D – Supplemental Financial Statements

NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

STATEMENT OF FINANCIAL POSITION

	12/31/2016 Per Audit	12/31/2017 Projection	12/31/2018 Projection
ASSETS			
Cash	\$54,523,918	\$54,283,778	\$55,379,617
Trade Accounts receivable	3,784,075	3,784,075	3,784,075
Prepaid expenses and other current assets	2,046,006	2,046,006	2,046,006
Security deposit	125,585	125,585	125,585
Plan Assets - 457b	1,109,883	1,459,883	1,809,883
Plan Assets - 457f	473,741	673,741	873,741
Property and equipment	10,791,214	11,798,427	13,072,427
Total Assets	\$72,854,421	\$74,171,494	\$77,091,333
LIABILITIES AND NET ASSETS			
Liabilities			
Current Portion			
Accounts payable and accrued expenses (incl, vacation accrual)	\$4,288,119	\$4,288,119	\$4,459,078
Accrued Incentive Comp	4,979,436	5,021,322	5,302,006
Deferred rent-current	396,121	480,457	566,808
Deferred compensation-current	-	-	-
Capital lease obligations - current	74,212	74,212	74,212
Accrued retirement liabilities	1,903,342	1,903,342	1,828,837
Debt Service - Current Portion	1,238,940	1,200,607	1,594,021
Deferred income	12,301,736	12,301,736	12,301,736
Deferred revenue - penalties	-	-	-
Deferred revenue - CRISP	2,418,927	2,418,927	2,418,927
Regional assessments	23,471,153	23,471,153	23,471,153
Total Current Portion	\$51,071,987	\$51,159,876	\$52,016,778
Long-Term Portion			
Deferred compensation ¹	\$1,527,436	\$2,077,436	\$2,627,436
Capital Project Financing - non-current	625,433	1,361,354	1,915,333
Deferred rent - non-current	3,015,784	2,535,327	1,968,519
CRISP Insurance Reserve	500,000	500,000	500,000
Deferred Revenue - Assessment Stabilization Reserve	-	-	-
Capital lease obligations - non-current	77,541	77,541	77,541
Total Non-Current Portion	\$5,746,195	\$6,551,659	\$7,088,830
Total Liabilities	\$56,818,183	\$57,711,535	\$59,105,609
Net Assets - unrestricted	\$13,265,238	\$14,288,959	\$16,414,724
Net Assets - restricted	2,771,000	2,171,000	1,571,000
Total Liabilities and Net Assets	\$72,854,421	\$74,171,494	\$77,091,333

¹Includes 457b liability, life insurance for former executive, and retiree medical

Exhibit A – Shared Assumptions and Key Focus Areas

Shared Business Plan and Budget Assumptions 2018-2020 Key Focus Areas for 2018

NERC and the eight Regional Entities (together the ERO Enterprise) are committed to a common operating model¹ that describes the characteristics of a highly efficient and effective Electric Reliability Organization (ERO) Enterprise. This operating model includes action items to address coordinated strategic and business planning, as well as performance monitoring processes across the enterprise. These processes remain transparent, with results reported on a quarterly basis to NERC's Corporate Governance and Human Resources Committee and the NERC Board of Trustees (Board) in support of the ERO Enterprise corporate oversight function.

At its November 2016 meeting, the Board approved the 2017-2020 ERO Enterprise Strategic Plan² with goals, objectives, and deliverables for the 2018–2020 planning period. The strategic plan lays out five goals that the ERO Enterprise will focus on over the next three years. Those goals include (1) risk-responsive Reliability Standards, (2) objective and risk-informed compliance monitoring and enforcement, as well as organization certification and registration, (3) identification and mitigation of significant reliability risks, (4) identification and assessment of emerging reliability risks, and (5) effective and efficient ERO Enterprise operations. The plan also identifies a number of associated contributing activities to achieve the goals of the ERO Enterprise. There are also seven overarching performance metrics to assess the overall effectiveness of the ERO Enterprise in addressing risk to the Bulk Electric System (BES) and improving BES reliability in 2017. These metrics concentrate on (1) experiencing fewer, less severe events, (2) allowing no gaps in Reliability Standards and compliance monitoring, (3) foreseeing resource deficiencies, (4) preventing unauthorized physical or cyber security access that disrupts BES facilities, (5) reducing reliability risk from noncompliance, (6) decreasing risks in targeted areas, and (7) managing NERC operations in an efficient and effective manner.

The following set of common assumptions has been developed to guide ERO Enterprise resource projections³ for the 2018–2020 period. Specifically, it supports the strategies heading into 2018 and establishes common assumptions, goals, and objectives as the ERO Enterprise begins the 2018 Business Plan and Budget (BP&B) cycle. Additionally, it outlines how these goals and objectives set the stage for periods beyond 2018, all in support of achieving the goals and objectives set forth in the Strategic Plan.

Immediately following each list of assumptions for the respective program areas is guidance for the Regional Entities in drafting each of their 2018 BP&B narratives. NERC will describe these key focus areas in the text of its BP&B and expects each Regional Entity to do the same for the applicable delegated functions. The goal is to ensure that NERC and the Regional Entity BP&Bs reflect the collaboration within the ERO Enterprise regarding significant operations and key activities. Additionally, the text of the Regional Entities' BP&Bs should continue to reflect resource allocation and support for ongoing delegated functions and activities.

The relevant ERO Executive Management Group (ERO EMG) working groups are encouraged to discuss the common assumptions and key focus areas to address impacts to their area of operations. The Regional

¹ [ERO Enterprise Operating Model](#)

² [ERO Enterprise Strategic Plan and Metrics 2017-2020](#)

³ NERC recognizes there are often unique factors that drive differences in each entity or organization's final determination of its resource needs and budget. Regional Entity-specific assumptions are stated in each Regional Entity's BP&B, as appropriate.

Entity operating leads and corresponding NERC staff have collaborated on the content included herein. The results of this collaboration guide the initial drafting of the NERC and Regional Entity BP&B documents, streamline NERC’s review of the initial drafts of the Regional Entity BP&Bs, and mitigate the need for material changes prior to (or after) posting of the draft BP&Bs.

Similar to prior planning cycles, the specific resource needs and budgets of NERC and the Regional Entities will be publicly posted and made available on NERC’s website for review. Each Regional Entity board approves its BP&B after an extensive review process that includes consideration of stakeholder input. In addition, the BP&Bs of NERC and each Regional Entity are approved in open session by NERC’s Finance and Audit Committee and Board as part of the annual BP&B process. NERC’s review of the Regional Entity BP&Bs will be primarily focused on ensuring alignment of activities with the Strategic Plan and adequacy of resources to support performance of delegated functions and key efforts. A 2018 BP&B schedule has been developed to identify important meeting dates, review periods, posting dates, etc. associated with the development and completion of the NERC and Regional Entity BP&Bs.

The assumptions noted below will continue to be refined based on comments received from stakeholders and the ongoing work conducted by NERC and Regional Entity leadership regarding specific goals, objectives, and supporting activities over the planning period.

LEGAL AND OPERATING FRAMEWORK

NERC and the Regional Entities will continue to work under the existing regulatory framework governing the establishment and enforcement of Reliability Standards for the BES established by applicable governmental authorities in the U.S., provincial regulatory and/or governmental authorities in Canada, and portions of Mexico, as well as the authorizations contained in the Federal Energy Regulatory Commission’s (FERC) Order approving NERC as the ERO. Additionally, as in prior years, the following responsibilities will continue:

- NERC enhancement of Regional Entity oversight for performance of their delegated functions.
- NERC and Regional Entity development of goals, measures, and reports to assess and evaluate the Regional Entities’ performance of their Regional Delegation Agreements (RDAs), NERC’s Rules of Procedure⁴ (ROP), the Compliance Monitoring and Enforcement Program (CMEP), FERC requirements, and directives that are in effect pursuant to Section 8(c) of the RDAs.
- NERC feedback and direction to the Regional Entities on performance improvements.
- NERC and Regional Entity collaboration to refine and revise processes and procedures to eliminate duplication, increase operational efficiencies, enhance ERO-wide consistency, and achieve measureable reliability outcomes.
- Regional Entity primary responsibility for day-to-day operations and interactions with registered entities.

STAKEHOLDER PARTICIPATION

NERC and the Regional Entities develop their BP&B’s based upon the assumption of continued stakeholder participation in support of key program areas, while recognizing that stakeholder resource limitations may

⁴ [NERC Rules of Procedure](#)

affect specific levels of participation in any given activity. The availability and adequacy of industry resource support will be evaluated on an ongoing basis.

EXTERNAL FACTORS

The performance and execution of BP&B's for each entity in the ERO Enterprise may be impacted by external factors. These factors include, but are not limited to, the following:

- FERC Orders, other applicable governmental authority actions, directives, audits, mitigation efforts, and performance assessments.
- Environmental Protection Agency (EPA) rules in the US and, likewise, provincial or Federal rules in Canada or Mexico that could potentially impact the reliability and/or operation of the BES.
- Other governmental agencies or departments that may issue rules, guidelines, orders, or directives that may impact the operation of the BES.
- The number and significance of changes within Balancing Authorities' and Reliability Coordinators' areas, prompting the need for associated re-certification and reliability plan assessments.
- The unanticipated rise in the rate and severity of entity violations.
- The unanticipated rise in the rate and severity of system events requiring formal investigations beyond historic volumes, and causal drivers of these events.
- New technologies and changes in resource or demand composition that require additional reliability studies and reliability risk analysis, including new techniques for conducting relevant assessments.
- Changes in applicable laws and regulations, including environmental laws and others.
- Priority risk activities identified by the Reliability Issues Steering Committee (RISC), committees of and reporting to the Board, and through other stakeholder input.
- The ability of stakeholders to support the pace and scope of the various activities while implementing the results of earlier efforts.

COLLABORATION WITH THE TRADE ASSOCIATIONS AND FORUMS

The activities of the North American Transmission Forum (NATF), North American Generator Forum (NAGF), and other forums and trade associations are expected to complement ERO Enterprise activities and mitigate incremental resource needs of NERC and Regional Entities in certain areas. NERC has a memorandum of understanding with the NATF and NAGF to ensure that the common objectives of each organization are achieved in the most efficient and effective manner. Increased collaboration between NERC and the NATF and NAGF is expected to continue.

KEY ASSUMPTIONS AND FOCUS AREAS BY PROGRAM AREA⁵

Reliability Standards

Assumptions (2018-2020)

- The number of continent-wide Reliability Standards development projects is expected to remain relatively stable, except as required to address any new FERC directives to create or modify Reliability Standards, or industry submittals of standard authorization requests.
- Continent-wide Reliability Standards projects will consist primarily of conducting enhanced periodic reviews on existing Reliability Standards to improve their content and quality, respond to identified risks to reliability (including those that may be identified through the implementation of risk-based Compliance Monitoring and Enforcement), and address FERC directives that may arise. This activity will require the allocation of technical resources from several internal NERC departments (e.g., Reliability Assessment and Performance Analysis (RAPA), Reliability Risk Management, Compliance Analysis and Certification, and Compliance Assurance) and support from across the ERO Enterprise.
- During the enhanced periodic review of Reliability Standards, any associated Regional Reliability Standards will be reviewed for potential incorporation as variances or as improvements to the continent-wide requirements. Regional and NERC Reliability Standards development processes may require modification to efficiently accomplish this task. Each Regional Entity will work with NERC and other Regional Entities as necessary on projects where there is a Regional Reliability Standard/variance.
- Regional Reliability Standards development activity is expected to remain low, driven by requests that the Regional Entity may receive or reliability issues that the Regional Entity may identify.
- In coordination with Standard Drafting Teams and consistent with current approaches, Regional Entities may support outreach during standard development and participate in the standard development activities as may be required to address reliability and stakeholder issues that may arise within their respective regions.
- Following FERC approval, NERC and the Regional Entities collectively will assist the transition of Reliability Standards to compliance monitoring and enforcement by supporting industry and auditor training or providing information regarding the intent of the Reliability Standard.
- The number of standard interpretations is expected to remain low. However, implementation guidance requests may increase.
- As noted in the assumptions for Information Technology (IT), Regional Entities will be asked to participate in teams to help develop application business requirements and test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Compliance Monitoring and Enforcement Process Tool project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.

⁵ These statements, which are generally organized by program area, are intended to help guide resource allocation decision-making in the development of the 2018 BP&Bs.

Key Focus Areas (2018)

- Sustaining feedback loops, including audit and enforcement experience, continent-wide perspectives, lessons-learned, and events analysis for enhanced periodic reviews focused on conducting measured, in-depth reviews to improve Reliability Standards using the enhanced periodic review template.
- Incorporate Regional Reliability Standards into continent-wide Reliability Standards as the continent-wide Reliability Standards are reviewed through the enhanced periodic review process.

Compliance Monitoring and Enforcement, and Organization Registration and Certification

Compliance Assurance and Enforcement

Assumptions (2018-2020)

- The implementation of the risk-based CMEP requires the allocation of dedicated resources from NERC and the Regional Entities for both compliance and enforcement. Regional Entities will require resources to complete the Inherent Risk Assessments (IRAs) for all registered entities in 2017-2019. In addition, Regional Entities will require resources to continuously update previously completed IRAs based on identified triggers and focus on creating compliance oversight plans that include compliance monitoring tools, the interval of compliance monitoring, and the Reliability Standards that are to be monitored.
- NERC and the Regional Entities will continue to evaluate business practices, implementation, and consistency within the risk-based compliance monitoring and enforcement program.
- NERC and the Regional Entities will continue to support the training and education requirements and guidelines necessary to meet the criteria set forth by the *ERO Enterprise Compliance Monitoring and Enforcement Manual* and the *Competency Guide*⁶.
- Planning and operating Reliability Standard violations are expected to remain constant as most registered entities have been audited and, thus, have a greater understanding of compliance expectations. A modest increase may also occur as revisions of certain standards or new Reliability Standards become effective.
- Compliance personnel will need to continue support of the implementation of cyber-security Reliability Standards:
 - NERC will continue Critical Infrastructure Protection (CIP) V5 training, coordination, and facilitation with the ERO Enterprise CIP auditors and the industry. ERO Enterprise CIP subject matter experts will support these activities to ensure appropriate knowledge and guidance is developed, understood by industry, and administered.
 - The allocation of resources in 2018 should be responsive to continued implementation by registered entities of new versions of the CIP Reliability Standards, while recognizing that the risk-informed focus will be used.
- Additional resource allocation may be necessary for increased Physical Security compliance monitoring activities for CIP-014 and the compliance monitoring activities related to the Supply Chain Risk Management Reliability Standard (CIP-013).

⁶ [ERO Enterprise Compliance Monitoring and Enforcement Manual and the Competency Guide](#)

- ERO Enterprise CMEP staff, particularly staff with visibility into risks existing in the field, will provide feedback to the ERO Enterprise. This feedback may include information on risks seen in the field that are not addressed by a standard, as well as information on where a standard is too broad. ERO Enterprise CMEP staff will participate in the development of a solution, regardless of whether the risk is addressed through a new or modified Reliability Standard, or other means.
- ERO Enterprise CMEP staff will provide input for standards development teams on the risks seen in the field relating to a standard under development, as well as for how a Reliability Standard would be monitored.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Compliance Monitoring and Enforcement Process Tool project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.
- NERC and the Regional Entities will continue to maintain the necessary resources to support the existing systems until ERO Enterprise application projects have been approved and implemented.

Key Focus Areas (2018)

- Monitoring and management of compliance monitoring and enforcement metrics in support of ERO Enterprise’s Strategic Plan and CMEP Oversight Program.
- Ongoing implementation and oversight of the risk-based CMEP, including IRAs, consideration of internal controls, and ensuring that Compliance Oversight Plans are addressing the relevant risks.
- Implementation and oversight of the CIP V5, CIP-013, and CIP-014 compliance monitoring programs, while recognizing that a risk-informed focus will be used.
- Continued ERO Enterprise-wide collaboration and implementation of consistent compliance monitoring and enforcement practices focused on higher reliability risks.

Compliance Analysis, Certification, and Registration

Assumptions (2018-2020)

- Two central reforms have been identified as a result of the completion of the risk-based registration activity in 2015:
 1. Modifications to the NERC Registry Criteria have been approved, including the elimination of three functional entities (Purchasing-Selling Entities, Interchange Authorities, and Load-Serving Entities), modifications to the threshold criteria for Distribution Providers, and alignment of five registration categories with the BES definition.
 2. The NERC-led review panel, which vets requests for Deactivation or decisions not to register an entity that does not meet the Registry Criteria, as well as disputes regarding the application of the Registration Criteria and requests for a sub-set list of applicable Reliability Standards (which may specify the Requirements/sub-Requirements), has been incorporated into the rules.

These reforms strengthen the registration process and are important milestones in NERC’s approach to managing risks to reliability. Deployment and implementation of these revisions began in 2015, with continued work in 2017 and 2018.

- No further enhancements are anticipated to support the ongoing next phases of the risk-based registration activity.
- The results from the 2016 registration program review will result in modifications to the program in 2018. The recommendations from the Organization Registration Program review are summarized below and will be prioritized by the Organization Registration and Certification Group (ORCG) for work to be conducted in 2017 and 2018:
 - NERC staff shall develop ERO Enterprise monitoring activities for 2018.
 - The NERC-led review panel should compile a list of possible ROP enhancements related to the NERC-led review panel processes and procedures.
 - NERC and the Regional Entities should develop and conduct outreach for industry to inform how the NERC-led review panel is conducted and how a submittal is processed.
 - NERC and the Regional Entities should conduct an in-depth review on Joint Registration Organizations (JROs)/Coordinated Functional Registrations (CFRs). This may include how a JRO/CFR works, what the obligations are, different models implemented across the ERO Enterprise, forms/formats and communication, and examples of how to document the agreements.
 - NERC should review its internal processes and procedures based on the recommendation from the independent audit.
 - NERC and the Regional Entity staffs should work collaboratively with the ERO CMEP technology staff in reaching their milestones.
 - NERC and the Regional Entities should draft a more defined procedure for its role in changes to BES Element status.
 - NERC should review the website to 1) ensure the NERC Registration website is up to date, with documents in the appropriate locations and 2) ensure documents posted to the NERC Registration website are accurate. NERC should seek any ORCG input into ideas for clean-up and document migration.
 - NERC and the Regional Entities should prioritize any current or future identified issues and focus to resolve the higher priority issues in a timely manner and report progress to the ORCG.
- The activities associated with the implementation of the BES definition have decreased and, therefore, no additional resource demands are expected in the registration area. However, with applications for Self-Determined Notifications no longer being accepted through the ERO Enterprise BESnet application, Regional Entities will need to validate, with NERC oversight, submittals to determine complete and proper application of the BES definition.
- Planned oversight activities for 2018 will be aligned with the ERO Enterprise Operating Model, which should not affect 2018 resource allocation and have little effect on overall NERC resource requirements. NERC understands that each Regional Entity will need to evaluate its individual resource needs and allocations.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Entity Registration project, the Enterprise Reporting data warehouse project, and the Compliance Monitoring and Enforcement Process Tool project will be dependent

on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of these projects.

Key Focus Areas (2018)

- Implementation of risk-based registration activities, collaborative development of a consistent registration program throughout the enterprise, and implementation of any registration program changes identified in the 2016 review, as listed above.
- Continued use of the NERC-led review panel, which may require four to six engagements per year that may require travel from each of the regional representatives.

Reliability Assessment and Performance Analysis (RAPA)

Reliability Assessment

Assumptions (2018-2020)

- NERC and the Regional Entities will continue to focus resources on high quality reliability assessments that address goals and their associated contributing activities identified in the ERO Enterprise’s 2018-2020 Strategic Plan for *Goal 3 – Identification and Mitigation of Significant Risks to Reliability* and *Goal 4 – Identification and Assessment of Emerging Risks to Reliability*.
- NERC and the Regional Entities will continue to support a common approach for NERC reliability assessments and ensure consistent evaluation, aligned with the ROP Section 800, Reliability Assessment Guidebook, and the Reliability Assessment Oversight Plan to be developed in 2017.
- NERC and the Regional Entities will advance data management strategies and analytical capabilities for identifying and determining reliability risks and conducting reliability assessments by:
 - Integrating the analysis and measures of essential reliability services (ERS) into the Long-Term Reliability Assessment. The process encompasses new data collection and analysis approaches needed to address assessment objectives of identifying reliability issues due to a changing resource mix.
 - Providing technical resources to examine transmission and deliverability studies and providing high-level evaluation for the Long-Term Reliability Assessment.
 - Providing technical resources, advanced statistical analysis tools, objective expert input, and reliability leadership for the advancement of probabilistic analyses supporting the Long-Term Reliability Assessment.
 - Supporting the NERC Enterprise Reporting Project to ensure Reliability Assessment data is integrated and supported by analytical reporting, data checking, and validation tools.
- NERC and the Regional Entities will provide technical expertise, research, and feedback to the industry, as well as provide foundational technical efforts that support reliability planning-related standards development. In addition to providing feedback, NERC will also solicit industry’s help while leveraging any industry research.
- NERC and the Regional Entities may require contractor and consultant services to maintain continued support and technical expertise associated with activities listed in the above

assumptions with supporting special assessment, scenario, or other technical research efforts. This could potentially impact both NERC and Regional Entity resource allocation including:

- Contractor services may be necessary to support special assessment analyses (e.g., EPA 111(d) evaluation or ERS), scenario analyses (e.g., polar vortex-like severe event analyses and gas-electric interdependence), and other technical research efforts (e.g., similar to geomagnetic disturbances (GMDs) and FAC-003 Vegetation Management).
- Contractor services may be needed to support research into GMDs and their impact on BPS operations (see FERC Order 830).
- Contractor services may be needed to support increase in data analysis to support ERS measures, CPS1/CPS2 control performance, and frequency trending.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Enterprise Reporting data warehouse project and the Compliance Monitoring and Enforcement Process Tool project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this projects.

Key Focus Areas (2018)

- NERC and the Regions will prioritize their work products according to the ERO Reliability Risk Priorities⁷ developed by the RISC, including: 1) Changing Resource Mix (Risk Profile #1), 2) BPS Planning (Risk Profile #2), and 3) Resource Adequacy and Performance (Risk Profile #3).
- Ongoing support for the Planning and Operating Committees and associated subcommittees, working groups, and task forces.
- Develop Reliability Guidelines and Technical Reference Documents based on priority and risk.
- Produce three required reliability assessments reflective of the common approach developed for NERC reliability assessments to ensure consistent treatment of resource and reliability evaluations: 1) Long-Term Reliability Assessment (incorporated probabilistic assessment), 2) Summer Reliability Assessment, and 3) Winter Reliability Assessment.
- Conduct special reliability assessments, as necessary, directed at high priority risks identified by RISC.

Performance Analysis

Assumptions (2018-2020)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces.
- NERC and the Regional Entities will continue to focus resources on system insights from high quality performance analysis, including:
 - Development and implementation of expanded and enhanced enterprise-based data collection and analysis systems, and capabilities for performance analyses. This area includes Transmission Availability Data System (TADS), Generating Availability Data System (GADS),

⁷ [ERO Reliability Risk Priorities](#)

Demand Response Availability Data System (DADS), Event Analysis, Alerts, substation equipment failure, and protection systems misoperations data.

- Support of the integration of information systems for assessments and associated data requirements (in support of data cleansing, blending, and validation).
- Maturing and developing interconnection-wide analysis groups to support the assessment of interconnection-wide risks, such as frequency response.
- Providing technical resources, analytical tools, and expertise to perform analyses as needed, including supporting and identifying risk priorities for standards development, compliance, and enforcement activities.
- Support the NERC Enterprise Reporting Project to ensure Performance Analysis data is integrated into consolidated system and supported by analytical reporting tools, as well as feedback loops to other parts of the ERO Enterprise such as compliance, standards, enforcement, etc.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Enterprise Reporting data warehouse project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.

Key Focus Areas (2018)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces.
- High quality performance analysis, including:
 - Development and implementation of expanded and enhanced enterprise-based data collection and analysis systems, and capabilities for performance analyses. This area includes TADS, GADS, DADS, Event Analysis, Alerts, substation equipment failure, and protection system misoperations data.
 - Support of the integration of RAPA information systems for assessments and associated data requirements, supporting delivery of high-quality reports (e.g., long-term, short-term, special or scenario assessments, and State of Reliability Report).
 - Providing technical resources and expertise to perform analyses as needed, including supporting and identifying risk priorities for standards development, compliance, and enforcement activities and feedback loops to other parts of the ERO Enterprise, such as compliance, standards, enforcement, etc.

System Analysis

Assumptions (2018-2020)

- NERC and the Regions are advancing their analytical capabilities to assess and report on the reliability of the BPS. Additionally, newer and maturing technologies, such as synchro-phasor measurement unit (PMU) technology, are enabling innovative approaches for event analysis, power system analysis, and model validation. NERC and the Regions are uniquely situated to perform analyses that require a wide-area view of the interconnections, as well as supporting

industry in advancing software and analytical capabilities where appropriate. Support and leadership to the System Analysis Subcommittee and any of the subcommittees, working groups, and task forces will continue.

- NERC will advocate to improve existing commercially available software capabilities and perform power system analysis that create a more profound understanding of system behavior (e.g., inter-area oscillations, frequency response, system strength, voltage/reactive performance, signal processing, and signature detection).
- NERC will provide direction and oversight of the interconnection case-building designees in support of interconnection model building and wide-area system analysis:
 - Mature and develop interconnection-wide analysis groups to support the assessment of interconnection-wide risks:
 - Conduct special reliability assessments based on recommendation from load modeling task force modeling to capture the impact of composite load modeling on transmission and distribution system--for example, Fault Induced Delayed Voltage Recovery.
 - Require powerflow, short circuit, and stability analysis tools and objective expert input for transmission adequacy and deliverability assessments and studies.
 - NERC and the Regional Entities' resources (through the case building designee agreements) will support the Planning Coordinators' development of long-term sustainable interconnection-wide powerflow, short circuit, and dynamics cases that exhibit the accuracy and fidelity reflecting actual BES reliability performance and dynamic conditions.
- NERC and the Regional Entities will advance modeling improvement capabilities to ensure the power system planning and operation models closely resemble actual operating conditions.
 - Perform periodic model validation against measured quantities and operational practices of the power system.
 - Perform case quality and fidelity assessment on interconnection wide models:
 - Case data quality.
 - Case performance fidelity.
 - Drive the advancement and use of dynamic load modeling on an interconnection-wide basis.
 - Formulate and guide the ERO Enterprise vision and associated activities to promote the advancement and use of dynamic load models and modeling practices.
 - Establish guidelines and technical reference documents related to dynamic load modeling practices, including explanations of existing dynamic load models and their structure, data sets, and parameter derivation.
 - Serve as the industry focal point and open forum for discussing dynamic load modeling practices for system planning and operations studies. Provide industry guidance and support to entities seeking direction on dynamic load modeling across North America.
 - Drive the advancement and use of inverter-based modeling on interconnection wide basis.
 - Establish guidelines and technical reference documents related to inverter-based resource modeling on transmission and distribution system.
 - The recommended modeling practices for utility scale renewable energy resources using new inverter based technology.

- NERC will support the maintenance of the BESnet application and manage processing of the BES Exception Requests (ERs), including technical validation of review and approval of Regional ERs, periodic reviews of network changes affecting BES Exception determinations, recertification of previously approved BES ER, as well as requests for certain registration and certification reviews. The Regional Entities will continue to process BES ERs per guidelines established in the ROP. Recertification for exceptions begins in 2018.
- NERC and the Regional Entities will work collaboratively to enhance the ERO Enterprise’s capability for event and forensic analysis, including:
 - Development of a process to ensure the compilation and creation of steady state, short circuit, and dynamic simulation model cases for use in the investigation and analysis of major power system disturbance events.
 - Evaluation of event disturbances using phasor measurements and other methods to assess sufficiency of data and models.
- NERC will provide technical expertise, research, and feedback to the industry, as well as foundational technical efforts that support the key reliability planning-related standards development. In addition to providing feedback, NERC will also solicit industry’s help by using resources and leveraging any research that has been done by the industry.
- NERC and the Regional Entities may require contractor and consultant services to maintain continued support and technical expertise associated with activities listed in the above assumptions, supporting special assessment, scenario analysis, or other technical efforts, potentially impacting both NERC and Regional Entity resource allocation, including:
 - If significant events occur, contractor services may be required to support wide-area system analyses and root cause evaluations.
 - Contractor services may be necessary to support special reliability assessment analyses (e.g., Inertia Response and Primary Frequency Response Analysis, Voltage and reactive performance study, and Inter-Area Oscillation Analysis).
 - Contractor services are needed to support Dynamic model developments (e.g., Composite Load Modeling, utility scale renewable energy modeling and distributed energy resources). For 2018, the Load Modeling Task Force is requesting load model testing (approximately \$100k).
 - Contractor services are needed to support the Synchronized Measurement Subcommittee with a PMU-based assessment (approximately \$100k).
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Enterprise Reporting data warehouse project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.

Key Focus Areas (2018)

- **Stakeholder and Committee Support** - Ongoing support for the Planning and Operating Committees, and associated subcommittees, working groups, and task forces.

- **ERO Enterprise Technical Support** - Ongoing support for BES exception processing, Risk-Based Registration, Standards, and Compliance support.
- **Modeling Improvement Initiatives** - Perform periodic model validation against measured quantities and event models to ensure case quality and fidelity and also case creation for event analysis.
- **Power System Analysis** - Develop technical analyses in key reliability areas, resulting in technically accurate and comprehensive reports addressing areas of concern (e.g., frequency response, short circuit strength, inter-area oscillation, distributed energy resource and load composition changes, etc.) to evaluate the characteristics and performance of the BPS with changes to the resource mix and integration of new technologies:
 - **Synchrophasor technology** - Collect strategically selected PMU data in near real-time for improved situational awareness and monitoring, and to gather larger PMU datasets for advanced data analytics and modeling improvements. Expand use of synchrophasor technology for power plant model verification and compliance with MOD-026/-027 standards.
 - **Oscillation analysis** - Broaden understanding of inter-area, local, and forced oscillations in all interconnections; use wide-area synchrophasor data to provide industry with better understanding of phenomena, available tools, and findings.
 - **Load and distributed resource modeling** - Drive education of dynamic load modeling and development of improved dynamic load models; supporting compliance with TPL-001-4. Support study and policy development related to end-use load behavior; advocate for grid-friendly load response.
 - **Frequency response analysis and vision** - Meet regulatory requirements per BAL-003-1; exploratory understanding of frequency response; support interconnection-wide studies of frequency response.
 - **Case quality metrics, model validation and improvement** - Improve case quality and robustness, support industry developments for MOD-033 tools and processes feedback loop with MOD-032 designees. Proactively seek to address deficiencies in interconnection-wide models and eliminate incessant problems. Ensure models can recreate plant behavior.
 - **Event Forensics** - Support NERC Event Analysis in event of major grid disturbance; simulation and data analysis expertise across multiple platforms.
 - **System Strength & Reactive/Voltage Performance Analysis** - Support ERS measure with advanced studies of potential phenomena under future end states; perform assessment of short circuit ratio study and implications based on regional/local studies.
 - **Geomagnetic Disturbances** - Conduct research on geomagnetic disturbances to address FERC Order 830 (three to four year research plan).
- **Technical Support, Standard Support, Implementation, and Outreach** - Provide technical expertise and unique insights to the industry. The department will also develop white papers, technical reports, and reference documents, as needed, to address emerging issues and industry concerns related to system planning and operations. The department will also develop and produce Reliability Guidelines for the Planning and Operating Committees. In addition to providing feedback, NERC will also solicit industry's help by using research work that has been done by the industry and academia.
 - 2-3 in-person workshops.

- Participation at industry technical groups, such as Institute of Electrical and Electronics Engineers (IEEE), North American SynchroPhasor Initiative (NASPI), International Council on Large Electric Systems (CIGRE), Power Systems Engineering Research Center (PSERC), etc., as needed.
- **Advanced Software Capabilities** - In order to conduct analysis and produce results in a timely manner, additional and improved data collection, data management, and analytical tools will be required. Robust analytical tools will increase the effectiveness of NERC staff to functionally correlate disparate data sources to ensure full-scope analyses and assessments of situations relevant to reliability risks are performed more broadly than in historical NERC analyses and assessments. Using state of the art software and technology is crucial to effective analysis especially considering the size of the North American electric footprint.

Situation Awareness and Infrastructure Security (including Event Analysis)

Situation Awareness

Assumptions (2018-2020)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces. Regional Entity involvement is expected to remain at current levels with no additional resources required from the Regional Entities.
- Registered entity participation in the ERO Enterprise Event Analysis Process, which involves active participation by Regional Entity staffs, will continue at or above current levels through 2018-2020.
- NERC will continue to require the software application known as Situational Awareness for FERC, NERC, and Regional Entities, Version 2 (SAFNrv2) for situation awareness, and The Event Analysis Management System (TEAMS) for Events Analysis. The allocation of additional resource investments is expected to maintain the capabilities of SAFNrv2 throughout the planning period. Any such investments will be NERC funded and not result in an allocation of cost to the Regional Entities.
- Regional Entities will continue to budget for event analysis and situational awareness activities based on their respective Region's historical workload, as they did in the past. Some Regional Entities will continue to allocate resources as part of the activities accounted for under their RAPA program and should clearly delineate where the activities' resources are budgeted.
- Regional Entities will support critical infrastructure security activities in the context of situation awareness, using those designated resources, unless specifically budgeted and managed elsewhere.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Enterprise Reporting data warehouse project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.

Key Focus Areas (2018)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces.
- Support for ERO Enterprise data collection and analysis, as well as the Enterprise Reporting Project designed to transfer the data to an integrated platform.
- Support for critical infrastructure security by promoting rapid and appropriate sharing of situational awareness information regarding security occurrences.
- Analysis of significant events to identify gaps in standards, compliance effectiveness, registration, and risk controls effectiveness.
- Work on overcoming barriers to the timely release of BES and security reports to industry through a secure portal.
- Providing of lessons learned and recommendations from events and identified risks.
- Enhancement of risk analysis capabilities by integrating risk data sources, such as event analysis, TADS, GADS, and protection system misoperations into situation awareness assessments.
- Participation as appropriate in periodic wide-area security exercises (e.g., GridEx, Monitoring and Situation Awareness Workshop, NERC HP Conference, feedback loops to other parts of the ERO Enterprise such as compliance, standards, enforcement, etc.).

Event Analysis

Assumptions (2018-2020)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces. Regional Entity involvement is expected to remain at current levels with no additional resources required from the Regional Entities.
- Registered entity participation in the ERO Enterprise Event Analysis Process, which involves active participation by Regional Entity staffs, will continue at or above current levels through 2018-2020.
- Regional Entities will continue to budget for event analysis and situational awareness activities based on their respective Region's historical workload, as they did in the past. Some Regional Entities will continue to allocate resources as part of the activities accounted for under their RAPA program and should clearly delineate where the activities' resources are budgeted.
- Regional Entities will support critical infrastructure security activities in the context of situation awareness, using those designated resources, unless specifically budgeted and managed elsewhere.
- As noted in the assumptions for IT, Regional Entities will be asked to participate in teams to help develop application business requirements and to test business functionality for ERO Enterprise applications projects. These teams will primarily be business area subject matter experts, not IT staff. The success of the Enterprise Reporting data warehouse project will be dependent on Regional Entity participation. When planning, Regional Entities should consider allocating resources at an adequate level of participation to support the success of this project.

Key Focus Areas (2018)

- Ongoing support for the technical committees and associated subcommittees, working groups, and task forces.

- Support for ERO Enterprise data collection and analysis, as well as the Enterprise Reporting Project designed to transfer the data to an integrated platform.
- Support for critical infrastructure security by promoting rapid and appropriate sharing of situational awareness information regarding security occurrences.
- Analysis of significant events to identify gaps in standards, compliance monitoring effectiveness, registration, and risk controls effectiveness.
- Work on overcoming barriers to the timely release of BES reports to industry through a secure portal.
- Providing of lessons-learned and recommendations from events and identified risks.
- Continue to provide industry leadership in the analysis, understanding, and prevention of human error and improved human performance with regards to increased BPS reliability.
- Enhancement of risk analysis capabilities by integrating risk data sources, such as event analysis, TADS, GADS, and relay misoperations.
- Participation as appropriate in periodic wide-area security exercises (e.g., GridEx and feedback loops to other parts of the ERO Enterprise such as compliance, standards, enforcement, etc.).

Electricity Information Sharing and Analysis Center (E-ISAC)

Assumptions (2018-2020)

- NERC will continue to fund, operate, and maintain the E-ISAC in performing its mission to reduce cyber and physical security risk to the electricity sector across North America by providing unique insights, leadership, and coordination. Threat information and mitigation best practices will be shared across the community, emphasizing reliability and resilience-related physical and cyber security considerations with a continued focus on potential impacts to an evolving footprint of essential reliability services.
- The stakeholder community served by the E-ISAC includes the ERO Enterprise and NERC registered entities and importantly extends into distribution system asset owners and operators; local, state, provincial, and federal (US, Canada, Mexico) government departments and agencies with electricity policy, information sharing, intelligence, research and development, and law enforcement roles, and additional cross-sector organizations and supply chain vendors. All information sharing with these stakeholders will continue to be subject to the E-ISAC Code of Conduct.⁸
- E-ISAC budgeting for FTE staff and programs will need to increase during this period to improve security analysis and stakeholder support.
 - With additional staff, there will be an increased budget requirement for staff security training, as well as travel within North America to utilities and stakeholder meetings for threat briefings, training, and exercises. Staff will provide subject matter expertise and analysis for physical and cyber security information requests from stakeholders, including risk-informing ERO Enterprise standards functions subject to Code of Conduct limitations.
 - Programs and capabilities to mature and enhance include: E-ISAC “Portal as a Platform” data analysis center functionality and stakeholder communication tools and meeting protocols for

⁸ [E-ISAC Code of Conduct](#)

rapid information sharing. Programs, such as the Cybersecurity Risk Information Sharing Program (CRISP) and other Department of Energy initiatives, will continue to apply supplementary participant funding approaches with no increased cost to the Regional Entities, except as elective participants.

- NERC will continue to fund and, through the E-ISAC, conduct security exercises and training to include the biennial Grid Security Exercise (GridEx) program, as well as “train the trainer” Cybersecurity Risk Assessment Program events, and timely emergent issues risk mitigation training (e.g., Ukraine, Internet of Things, etc.) with no increased cost to the Regional Entities, other than travel expenses for in-person meetings and briefings.
- NERC will continue to fund E-ISAC conducted security-related meetings and threat briefs to include the Grid Security Conference (GridSecCon) as an annual event, monthly conference calls, and other regular or emergent issue threat briefings as required with coordination from appropriate government entities. Other than funding registration fees and travel expenses for individual attendees from their Regional Entity, no Regional Entity funding is anticipated.

Key Focus Areas (2018)

- **Stakeholders:** The E-ISAC will continue to add value for stakeholders through member engagement, information sharing and analysis, and function as a coordinating hub within the electricity subsector for the ERO Enterprise and the Electricity Subsector Coordinating Council (ESCC) Playbook communications with industry and government. The E-ISAC will work closely with emerging, resource-dedicated Regional Entity security functions⁹ that are rigorously separated from compliance and enforcement areas. The ESCC Member Executive Committee will provide industry guidance to help the E-ISAC improve. E-ISAC staff will continue to interface with important security-related stakeholder groups (such as the Critical Infrastructure Protection Committee) as subject matter experts and continue developing relevant security metrics.
- **Staff:** Resourcing requirements indicate appropriate expansion for additional cyber and physical analytic staff to fulfill value delivery elements of this plan. Additionally, adequate resourcing is planned to ensure NERC support for standard, recurring professional security training for staff, as well as North American travel to fulfill the E-ISAC mission.
- **Systems and Programs:** The centerpiece of E-ISAC collaboration with members is the Portal, which will undergo an important upgrade in 2017 into a much more capable “platform” model to support and coordinate key initiatives, including: improved collaboration capability, data analysis center functionality, improved stakeholder management, malware “drop box,” and more. In 2018, lessons learned from GridEx IV (November 2017) will also be available to drive further enhancements of the Portal platform. CRISP and other key programs, in partnership with DOE, will continue to support expanded membership engagement and analytic capability advancements.

⁹ Regional Entities should designate in writing the person(s) who will be separate from ERO CMEP functions to provide security-focused point(s) of contact to the E-ISAC who will receive access to security products on the portal. A security designation template is available from the E-ISAC.

Training, Education, and Continuing Education

Assumptions (2018-2020)

- NERC will continue to fund the ERO Enterprise Learning Portal (EELP). NERC will work with the Regional Entities to consolidate learning resources and promote better coordination, planning, delivery, and management of learning activities across the ERO Enterprise in concert with Region-specific learning activities/requirements.
- Regional Entities will allocate resources to meet their statutory and delegation agreement requirements. The Regional Entities, in collaboration with NERC, will jointly contribute to the assessment and determination of ERO Enterprise learning and outreach needs. This includes advocating flexibility in the approach between Regional Entities and anticipating areas of support for their staff and stakeholders regarding the ERO Enterprise’s programs.
- CMEP staff training and education are expected to remain a focal point for the ERO Enterprise. NERC will continue to lead the development of a compliance learning curriculum with assistance of qualified subject matter experts from the Regional Entities, Operational Leadership Team (OLT) working groups, and incorporation of outside expertise/services.
- Much of the financial cost for the Regional Entities’ ERO Enterprise learning development support is through the functional program support cycle. However, Regional Entities should continue to budget travel funds for attendance at development meetings that result from special requirements as business needs are clarified throughout the year. These funds may also support attendance at future joint ERO Enterprise training meetings/workshops. These potential meetings will likely not exceed three in a year with a requirement for one or two persons attending at any one time.
- Regional Entities must allocate resources to address compliance and enforcement staff learning needs that are associated with the implementation of the risk-informed CMEP.
- Contractor and consultant services are imperative to the development, delivery and technical support load anticipated for ERO Enterprise learning needs/activities.
- The NERC Continuing Education Program is expected to remain at steady state in support of system operator certification. Potential expansion to other functional programs would be known well in advance and additional funding will be allocated to support the expansion.

Key Focus Areas (2018)

- Participate in the ERO Enterprise staff learning development process through the OLT working groups, NERC functional area program leaders, and coordinating/working meetings. This requires commitment of resources, subject-matter expertise, and trainers in identifying learning needs, content development/coordination, product review/feedback, and delivery.
- Provide and maintain administrative support to the EELP. This includes maintaining the Regional Entity-specific portion of the system and coordinating/collaborating with the NERC administrator in improvement and operation of the system for the ERO Enterprise.
- Facilitate ERO Enterprise learning by analyzing events, communicating lessons learned, tracking recommendations, and supporting the use of the EELP for learning scheduling, delivery, and records management.
- Support coordination, planning, delivery, and management of learning efforts across the ERO Enterprise in concert with Region-specific training, education, and outreach needs/activities.

- In collaboration with NERC program leaders, support learning development efforts for ERO Enterprise staff and stakeholders as identified/needed in the course of program management activities, development, and outreach.

Personnel Certification

Assumptions (2018-2020)

- NERC will continue to provide required support and leadership for the Personnel Certification Governance Committee (PCGC) and working groups serving the PCGC.
- The Personnel Certification program is expected to remain at a steady state with no additional resources required from the Regional Entities.

Key Focus Areas (2018)

- Continue to update System Operator Certification Exam Item Bank to ensure relevance to current Reliability Standards and promote reliability of the BPS.
- Develop Exam “Skills Assessment” Strategy to better assess the skills and knowledge of System Operators.
- Evaluate Credential Review and Rationalization to maintain credential.

Information Technology

Assumptions (2018-2020)

- NERC and the Regional Entities will work collaboratively to refine existing strategies and governance and procurement practices applicable to the development, operation, and maintenance of enterprise architecture, including software and data systems supporting both NERC and Regional Entity operations.
- NERC’s BP&B will include ongoing funding support for the development, operation, and maintenance of ERO Technology Leadership Team (TLT) and ERO EMG-approved enterprise applications. Enterprise application funding in any given year will be subject to the budget and funding limits set forth in NERC’s approved BP&B. Regional Entities should include appropriate funding for applications and supporting systems designed to satisfy Regional business needs.
- Regional Entities may be required to provide or augment business teams to help develop application business requirements and to test business functionality within the ERO Enterprise applications, such as the CMEP Technology Program Steering Committee.
- Ongoing investments will be required to develop, implement, and maintain enhancements to the NERC and Regional Entity websites, ERO Enterprise applications, and ERO Enterprise data repositories, which are required to improve access to information and data. NERC and the Regional Entities will separately fund any enhancements to their own websites.

Key Focus Areas (2018)

- Following a disciplined process with appropriate ERO TLT approval, along with budgetary controls, the ERO Enterprise Project Management Office will deliver agreed upon ERO Enterprise IT

applications designed to be used by NERC, the Regional Entities and, in some cases, registered entities. To ensure close coordination, collaboration, and efficiency, to the extent the agreed upon applications are in progress or widely available, NERC and the Regional Entities will not build or duplicate ERO Enterprise application functionality.

- NERC’s BP&B will include ongoing funding support for the development, operation, and maintenance of NERC and Regional Entity approved enterprise applications. Enterprise application funding in any given year will be subject to the budget and funding limits set forth in NERC’s approved BP&B.
- When no ERO Enterprise applications are available to satisfy the requirement, Regional Entities should provide a description of the maintenance and capital investment in software required in performance of their delegated functions. The NERC IT budget does not supplant Regional Entity need for IT expenditures for specific regional projects.

Key focus area projects include:

- Enhancing collaboration and information sharing by leveraging Microsoft’s SharePoint platform. At the first phase (2015-2017) of the project, NERC is scheduled to deliver a Document Management system and NERC Intranet interface. The second phase includes delivery of enhancements to NERC’s public facing website. The third phase is scheduled for 2018-2019 and will deliver NERC extranet, as well as replace email document collaboration with Microsoft’s SharePoint collaboration System.
- Improving entity specific communication and information sharing across the ERO Enterprise. Plans include a new intelligent announcements and alert solution to be delivered in 2017-2019.
- Implementing new Enterprise-wide support tools for CMEP. Its first phase to deliver a centralized entity registration solution is scheduled for 2017. The second phase enables NERC Reliability Standards to be used as shared data and is scheduled for 2017-2019. The third phase delivering new solutions and retiring current solutions that support the CMEP is scheduled for 2017-2020.
- Consolidating data collected by NERC and making it available for analysis by authorized organizations. The build out of an ERO Enterprise Data Warehouse is currently underway. Additional data will be extracted, transformed, and loaded during 2017-2020. Data to be loaded includes generation, transmission, events, misoperations, and compliance data.

ERO Enterprise-wide Risk Management

Assumptions (2018-2020)

- A common ERO Enterprise risk management framework commenced in 2014 to focus on identifying, assessing, prioritizing, and mitigating risks associated with the performance of both NERC and the Regional Entities. This multi-year activity is progressing as expected and will reach steady state by 2017.
- NERC’s Director of Internal Audit and Corporate Risk Management is responsible for the overall development of this framework, with the approval of the ERO Regional Executives and under the oversight of NERC’s Enterprise-wide Risk Committee.
- NERC and the Regional Entities will continue to devote resources to implement this framework. The results will serve as an input into NERC’s future audit plans, which are reviewed and approved

by the NERC Board of Trustees Enterprise Risk Management Committee. Regional Entities may add risk management and internal control resources as needed.

Key Focus Areas (2018)

- NERC and Regional Entities key focus areas include continued refinement, validation, and prioritization of inherent and residual risks; greater precision in the identification of risk mitigation activities and internal controls; and enhanced consolidated results for ERO EMG review and approval.

Exhibit B – Application of NERC Section 215 Criteria

DISCUSSION OF HOW THE NERC MAJOR ACTIVITIES IN THE 2018 BUSINESS PLAN AND BUDGET MEET THE NERC WRITTEN CRITERIA FOR DETERMINING WHETHER A RELIABILITY ACTIVITY IS ELIGIBLE TO BE FUNDED UNDER FEDERAL POWER ACT SECTION 215

I. Introduction

This Exhibit discusses how the major activities in NERC’s 2018 Business Plan and Budget meet the NERC written criteria for determining whether a reliability activity is eligible to be funded under §215 of the Federal Power Act (“FPA §215”). This Exhibit is intended to satisfy Recommendation No. 38 resulting from the financial performance of NERC conducted by the Commission’s Division of Audits (“DA”) in 2012-2013 and adopted by the Commission in its November 2, 2012 order on NERC’s 2013 Business Plan and Budget.¹ NERC submitted the written criteria to the Commission in a compliance filing dated February 21, 2013 in Docket No. FA11-21-000.² The Commission approved the NERC written criteria, with modifications, in an order issued in that docket on April 18, 2013.³ The NERC written criteria as used in this Exhibit incorporate the modifications specified in the Compliance Order.⁴

II. Reliability Standards Program 2018 Major Activities

The major activities of the Reliability Standards Program are described at pages 25-27 of the 2018 Business Plan and Budget. The Reliability Standards Program carries out the ERO’s responsibility to develop, adopt, obtain approval of, and modify as and when appropriate, mandatory Reliability Standards for the reliable planning, operation, and critical infrastructure protection of the North American Bulk Electric System (BES). The major activity areas for this program include (1) providing project management and leadership to the reliability standard development process to deliver high-quality, continent-wide reliability standards, both new and modified, including standard development outreach activities, facilitation of drafting team activities, drafting support, assisting drafting teams in adhering to the processes in the *Standard Processes Manual*, and ensuring that the quality of documents produced are appropriate for approval by industry and the NERC Board; (2) facilitating continent-wide industry engagement in the standard development processes; and (3) conducting industry balloting on standards, disseminating information on standards and the standard development processes, and supporting regulatory filings and proceedings relating to standards. Additionally, the Reliability Standards Program provides technical advice and final quality review for Regional Entity standards development processes, presents proposed regional standards to the NERC Board, and prepares submissions for approval of regional standards to the applicable regulatory authorities in the U.S. and Canada.

For 2018, the major activities of the Reliability Standards Program will continue to focus on (1) selection of standards projects to be undertaken based on the nature of the reliability issue, and whether

¹ *North American Electric Reliability Corporation, Order Accepting 2013 Business Plan and Budget of the North American Electric Reliability Corporation and Ordering Compliance Filing*, 141 FERC ¶ 61,086 (2012) (“2013 Budget Order”). Recommendation 38, as adopted in the 2013 Budget Order, is: “In its annual business plan and budget filings, [NERC should] provide an explanation as to why the proposed activities to be undertaken by each program area for the budget year are statutory, including, at a minimum: a description and the purpose of the major activities to be taken by each program area and an explanation for why the activity is a statutory activity.” *Id.* at P 16.

² *Compliance Filing of the North American Electric Reliability Corporation in Response to Paragraph 30 of November 2, 2012 Commission Order – NERC Written Criteria for Determining Whether a Reliability Activity is Eligible to be Funded Under Federal Power Act Section 215*, filed February 1, 2013 in Docket No. FA 11-21-000 (“February 1, 2013 Compliance Filing”).

³ *North American Electric Reliability Corporation, Order on Compliance*, 143 FERC ¶ 61,052 (2013) (“Compliance Order”).

⁴ For ease of reference, the complete NERC written criteria, as modified in accordance with the Compliance Order, are provided at the end of this Exhibit.

a standard or another solution is most appropriate to address the issue; (2) addressing Commission directives and responding to Commission orders as necessary through the standards process; (3) performing periodic reviews of standards; (4) facilitating smooth transitions to new standards through developing guidelines, webinars, and other activities to support auditor and industry training for new standards. Identification of need for any new standards projects will be based on sources such as Commission directives and reliability risks identified by the Reliability Risk Management Process or the Reliability Issues Steering Committee (RISC); and (5) implementing the results of the comprehensive review of standards conducted in 2017 by initiating projects to review or retire standards.

The major activities of the Reliability Standards Program satisfy the following criteria:

I.A: Is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC Rules of Procedure (ROP)?

I.B: Is the activity necessary or appropriate for providing guidance and assistance to Regional Entities in carrying out Regional Reliability Standards development activities?

I.C: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated?

I.D: Is the activity necessary or appropriate for the provision of training and education concerning Reliability Standards development processes, procedures, and topics for/to (i) NERC personnel, (ii) Regional Entity personnel, (iii) industry personnel?

II.F.1: Is the activity necessary or appropriate for the provision of training, education and dissemination of information for/to (i) NERC personnel, (ii) Regional Entity personnel, and (ii) industry personnel with respect to compliance monitoring and enforcement topics and topics concerning reliability risks identified through compliance monitoring and enforcement activities, such as (1) Requirements of Reliability Standards, including how to comply and how to demonstrate compliance? This includes development of guidance and interpretation documents.

IV: Is the activity one that was required or directed by a Commission order issued pursuant to §215? (Reliability Standards development projects are often initiated in response to directives in Commission orders).

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC's ROP that have been approved by the Commission as "Electric Reliability Organization Rules" (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provisions for these major activities are §300 and Appendix 3A.)

VI: Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and applicable provisions of Commission orders?

IX. Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?

X. Is the activity necessary or appropriate for the analysis and evaluation of activities encompassed by one or more of the other criteria for the purpose of identifying means of performing the activities more effectively and efficiently?

III. Compliance Monitoring and Enforcement and Organization Registration and Certification Program Area 2018 Major Activities

The major activities of the Compliance Monitoring and Enforcement and Organization Registration and Certification Program Area are described at pages 29-32, 35-36, and 39-43 of the 2018 Business Plan and Budget. This Program Area is comprised of three operational groups: (1) Compliance Assurance (addressing compliance monitoring), (2) Compliance Analysis, Organization Registration and Certification (addressing assurance, organization registration and certification), and (3) Compliance Enforcement.

The Compliance Assurance group works collaboratively with the Regional Entities to ensure effective implementation of risk-based compliance monitoring under the Compliance Monitoring and Enforcement Program (“CMEP”) across the entire ERO Enterprise. This group’s activities include the following major activities and functions: (1) ensuring that Regional Entities monitor registered entities for compliance according to their specific facts and circumstances, developing customized compliance oversight plans (COPs) for each registered entity based on its inherent risk assessment (IRA); (2) overseeing Regional Entities’ IRAs of registered entities; (3) oversight of the quality implementation of the risk-based compliance monitoring program; (4) development of the annual CMEP Implementation Plan; (5) oversight of use of necessary compliance-related processes, procedures, IT platforms, tools and templates; (6) development and delivery of education and training for ERO Enterprise staff; (7) conducting CIP V5 training and education programs and other outreach that support industry compliance and security; (8) conducting CIP-014-2 training and outreach activities related to effective implementation of the Physical Security Reliability Standard; (9) coordinating with the NERC Standards department for standards development to provide compliance information, statistics, and perspectives to standard drafting teams to foster development of standards that provide increased reliability benefit and clarify compliance risks, and to assist in smooth transitions for standards from development to enforceability; (10) supporting Regional Entity and industry committees, working groups and task forces, such as the NERC Compliance and Certification Committee (CCC) and Critical Infrastructure Protection Committee (CIPC); (11) industry-focused outreach events and webinars on risk-based CMEP activities; and (12) promoting registered entities’ development of effective compliance programs and internal controls.

The ongoing and new major activities of the Compliance Assurance group for 2018 will include: (1) continuing to implement the risk-based compliance program, including ongoing oversight of the risk-based CMEP, IRAs, internal controls, and ensuring that COPs are addressing the relevant risks; (2) working with NERC Enforcement and IT and with Regional Entity staffs development of the CMEP Process tool; (3) supporting the continued successful implementation of CIP V5 standards and subsequent enhancements that became or become effective in 2017 and beyond; (4) continuing to monitor and support effective implementation and monitoring of the Physical Security Reliability Standard; (5) continuing the training program for Regional Entity staff to support the ERO Auditor Capabilities and Competencies Guide; (6) continuing to provide feedback to the Standards Program to integrate standards and compliance functions for clear stakeholder implementation, including through a common set of Reliability Standards Audit Worksheets; (7) supporting international CMEP activities including reliability and security subject matter expertise and outreach; (8) providing support and leadership to applicable committees and subcommittees including the CIPC and the CCC; and (9) continuing to periodically host an Energy Technologies Roundtable for in-depth discussion of integrating emerging technologies associated with BPS operations to address cyber and physical security risks.

The Compliance Analysis, Organization Registration and Certification group is responsible for a range of requirements and activities embodied in Section 500 and Appendices 5A and 5B of the NERC ROP, including providing technical resource support to standards development, compliance monitoring, and enforcement; ensuring that all entities impacting the BES are registered commensurate with risk; ensuring all Reliability Coordinators (“RC”), Balancing Authorities (“BA”) and Transmission Operators (“TOP”) are certified; conducting industry reliability assurance activities; and ensuring that compliance gaps identified in reportable events are assessed and addressed if appropriate. Major activities of this group include (1) registration of BES users, owners, and operators who are responsible for compliance with Commission-approved Reliability Standards; (2) evaluating and certification of the competency of RCs, BAs and TOPs; (3) conducting activities to reasonably assure the ERO that certain actions have been taken as reported in response to NERC Alerts or guidance to industry; (4) providing oversight of Regional Entity implementation of regional registration, compliance, certification, investigation, and complaint programs and processes; (5) conducting investigations to identify Possible Violations of Reliability Standards in response to complaints, BES disturbances, or other triggers, including participating on all Regional Entity-led investigations and as observers as requested on Commission-led reliability investigations and inquiries; (6) working with Regional Entity staff to confirm that qualified events and disturbances are evaluated against the relevant Reliability Standards and to ensure formal compliance monitoring occurs if indicated; and (7) addressing formal complaints that allege violations of Reliability Standards. Specific major activities of Compliance Analysis, Organization Registration and Certification for 2018 will include continuing to conduct NERC-led panels on registration requests; continuing to implement registration program improvements and certification program improvements identified in prior years, including conducting training as necessary; and evaluating BES disturbances and events for potential gaps in compliance monitoring or reliability standards.

The Compliance Enforcement department is responsible for overseeing enforcement processes, the application of Penalties or sanctions, and activities to mitigate and prevent recurrence of noncompliance with Reliability Standards. The Department works collaboratively with the Regional Entities to ensure consistent and effective implementation of the risk-based CMEP, including evaluating the consistency of disposition methods including assessment of Penalties or sanctions. It also focuses on ensuring that the ERO Enterprise dedicates resources to the matters that pose the greatest risk to reliability. The Compliance Enforcement department monitors Regional Entities’ enforcement processes and provides oversight over the outcomes of such processes, to ensure due process, identify best practices and process efficiency opportunities, and promote consistency among Regional Entities’ business practices; collects and analyzes compliance enforcement data and trends to assist with identification of emerging risks and help to inform development of enforcement policy and processes; files Notices of Penalty (“NOP”) and other submittals associated with noncompliance discovered through Regional Entity compliance monitoring and enforcement activities; processes and files NOPs and other submittals discovered through NERC-led investigations and audits; collaborates with other NERC departments, including Compliance Assurance, Reliability Standards and Regional Entity Coordination; and delivers training of the ERO Enterprise staff and outreach to registered entities on compliance and enforcement topics. Compliance Enforcement also conducts outreach activities that focus on self-logging, compliance exceptions, and risk assessment of noncompliances.

During 2018, the Compliance Enforcement department will continue to focus on the successful implementation of, as well as refining and improving, the risk-based CMEP. The major activities of Compliance Enforcement will include continuing to refine and improve risk-based CMEP processes; continuing to implement in a transparent manner the risk-focused ERO Enterprise enforcement philosophy; expanding the feedback loop of information from Enforcement to Standards and other program areas; and working with Compliance Assurance, IT, and Regional Entity staffs regarding

improvements in the existing compliance, reporting, analysis system and other compliance tools to support risk-based activities.

The major activities of the Compliance Monitoring and Enforcement and Organization Registration and Certification Program Area satisfy the following criteria:

I.A: Is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC ROP?

I.C: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated?

II.A: Is the activity necessary or appropriate for the identification and registration of users, owners, and operators of the Bulk Power System that are required to comply with Requirements of Reliability Standards applicable to the reliability functions for which they are registered?

II.B: Is the activity necessary or appropriate for the Certification of Reliability Coordinators, Transmission Operators and Balancing Authorities as having the requisite personnel, qualifications and facilities and equipment needed to perform these reliability functions in accordance with the applicable Requirements of Reliability Standards?

II.D: Is the activity necessary or appropriate for conducting, participating in or overseeing compliance monitoring and enforcement activities pursuant to the NERC ROP and (through the Regional Entities) the Commission-approved delegation agreements?

II.E: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information to monitor and enforce compliance with Reliability Standards, including evaluating the effectiveness of current compliance monitoring and enforcement processes, the need for new or revised compliance monitoring and enforcement processes, and the need for new or different means of training and education on compliance with Reliability Standards.

II.F: Is the activity necessary or appropriate for the provision of training, education and dissemination of information for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel with respect to compliance monitoring and enforcement topics and topics concerning reliability risks identified through compliance monitoring and enforcement activities, such as: (1) Requirements of Reliability Standards, including how to comply and how to demonstrate compliance? This includes development of guidance and interpretation documents. (2) Compliance monitoring and enforcement processes, including how to conduct them, how to participate in them, and the expectations for the process? This includes development of guidance documents. (3) Disseminating, through workshops, webinars, Advisories/Recommendations/Essential Actions, and other publications, “lessons learned” information on compliance concerns and reliability risks obtained through compliance monitoring and enforcement activities, monitoring and investigation of Bulk Power System major events, off-normal occurrences and near miss events, and other Bulk Power System monitoring activities? (4) Registered Entity internal processes for compliance with Reliability Standards, such as development, implementation and maintenance of internal reliability compliance programs?

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC’s ROP that have been approved by the Commission as “Electric Reliability Organization Rules” (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provisions for these major activities are §400 and 500 and Appendices 4B, 4C, 5A, 5B and 5C.)

VI: Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and applicable provisions of Commission orders?

IX: Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in the activities encompassed by one or more of the other criteria?

X: Is the activity necessary or appropriate for the analysis and evaluation of activities encompassed by one or more of the other criteria for the purpose of identifying means of performing the activities more effectively and efficiently?

IV. Reliability Assessment and System Analysis Program 2018 Major Activities

The major activities of the Reliability Assessment and System Analysis (RASA) Program are described at pages 45-50 of the 2018 Business Plan and Budget. The RASA Program carries out the ERO’s responsibility to conduct assessments of the reliability and adequacy of the BES to provide insight and guidance about reliability risks. RASA focuses on developing a technical framework and understanding of the emerging reliability risks facing the industry. The principal activity areas of the RASA Program include: independent assessments and reports on the overall reliability and adequacy of the BES, and associated reliability risks that could impact the short-term, mid-term and long-term planning horizons and other reliability issues requiring an in-depth analysis; interconnection-wide analysis for analyzing steady-state and dynamic conditions, including frequency, Essential Reliability Services, stability, short circuit ratio, and oscillatory behavior aspects; assurance oversight that electrical elements necessary for reliable operation of the BES are identified; support for development and improvement of long-term sustainable interconnection-based power flow, dynamic and load models that exhibit the accuracy and fidelity reflecting actual BES reliability performance and dynamic conditions; advancement of industry and the ERO’s understanding of power system characteristics and behaviors by gathering larger PMU datasets of data for advanced data analytics and modeling improvements; and establishing reliability leadership and consistent, technically sound guidance and recommendations that position industry and policy-makers to enhance reliability through effective outreach and communications.

The RASA Program works with industry leaders to create a reliability strategy that is relevant, timely, and effective at addressing the most important reliability risks, through reviewing and addressing key priority risks identified by the NERC RISC, synthesizing information identified through analysis and assessment efforts, extracting and prioritizing the associated reliability risks; sharing and integrating risk analysis insights across the ERO Enterprise; and translating that knowledge into actionable guidance and recommendations for NERC management, the Board, and entities, and government policy makers. RASA monitors the ongoing and historic reliability performance of the BES through data gathered to analyze historic trends, and provides reports and recommendations regarding the anticipated conditions that could impact reliability, security and stability of the BPS. RASA conducts reliability assessments to evaluate the expected reliability of the BES through extensive deterministic and probabilistic analyses to identify potential reliability risks and mitigation approaches. Key assessments include the Long-Term Reliability Assessment (supplemented by the Probabilistic Assessment), Summer and Winter Reliability

Assessments, and Short-Term and Special Reliability Assessments. A significant ongoing effort focuses on the continued development of effective Essential Reliability Services. RASA also focuses on understanding the technical behavior of the North American grid, as the foundation for identifying crucial aspects of performance that are important for sustaining overall reliability.

RASA works closely with other organizations such as the Electric Power Research Institute (EPRI), Department of Energy (DOE), Institute of Electrical and Electronics Engineers (IEEE), Institute of Nuclear Power Operations (INPO), North American Transmission Forum (NATF), North American Generation Forum (NAGF), Canadian Electricity Association (CEA), Interstate Natural Gas Association of America, and Natural Gas Supply Association, on a number of energy industry reliability issues such as geomagnetic disturbances, vegetation management, variable generation integration, and interdependency of gas and electric systems.

The ongoing and new major activities of the RASA Program for 2018 include: (1) implementing advanced reliability assessment and system analysis methods to address the changing nature of the grid, including issuing reliability assessment reports, guidelines, and recommendations to address high priority evolving performance trends and address emerging risks to reliability; (2) issuing special assessments on identified high-priority risks as prioritized and recommended by the RISC, including on changing resource mix and maintaining Essential Reliability Services, increased penetration of distributed energy resources, increasing dependency on generation fuel by natural gas, and inter-area and local system oscillations in all interconnections and their potential impact on interconnection reliability; (3) developing technical analyses in key reliability areas, such as Frequency Response, Short Circuit Strength, Inter-Areas Oscillation, and Distributed Energy resources; (4) providing technical expertise, research and feedback to the industry; (5) continuing to explore use of state-of-the-art software to conduct power system analyses and enhancing the use of real-time tools by industry; (6) supporting Reliability Standard development by providing subject matter expertise; (7) providing support and leadership to the NERC Planning Committee and to standing committees and subcommittees, working groups, and task forces, including supporting the development of technical reference documents and Reliability Guidelines; (8) supporting major event investigations, analyses, and reporting of findings, recommendations, and lessons learned that will improve reliability; (9) providing feedback to interconnection-wide model-building groups on improvements to system model quality and fidelity; and (10) assisting in development of approaches to registration and provide input to NERC staff in support of the development of CMEP risk elements, as well as supporting and leading the BES Definition Exception process.

The major activities of the RASA Program satisfy the following criteria:

I.A: is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC ROP?

I.C.1: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated, such as: (1) Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?

II.A: Is the activity necessary or appropriate for the identification and registration of users, owners, and operators of the Bulk Power System that are required to comply with Requirements of Reliability Standards applicable to the reliability functions for which they are registered?

III.A: Is the activity necessary or appropriate for the preparation or dissemination of long-term, seasonal, and special assessments of the reliability and adequacy of the Bulk Power System?

III.B: Is the activity necessary or appropriate for measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?

III.F: Is the activity necessary or appropriate for the development and dissemination of Advisories/Recommendations/Essential Actions regarding lessons learned and potential reliability risks to users, owners, and operators of the Bulk Power System?

IV: Is the activity one that was required or directed by a Commission order issued pursuant to §215? (FERC orders directed NERC to develop and implement a revised definition of “Bulk Electric System” and a procedure for requesting and receiving exceptions from the BES definition, and subsequently approved NERC’s proposed revised BES definition and its proposed BES exception procedure.)

V. Is the activity one that is required or specified by, or carries out, the provisions of NERC’s ROP that have been approved by the Commission as “Electric Reliability Organization Rules” (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provisions for this major activity are §801-806 and 809-810 and Appendix 5C.)

VI: Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and applicable provisions of Commission orders?

IX: Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?

X: Is the activity necessary or appropriate for the analysis and evaluation of activities encompassed by one or more of the other criteria for the purpose of identifying means of performing the activities more effectively and efficiently?

V. Reliability Risk Management (Situation Awareness, Event Analysis and Performance Analysis) 2018 Major Activities

The major activities of the Reliability Risk Management (“RRM”) group, which is comprised of the Situation Awareness Department, the Event Analysis Department, and the Performance Analysis group, are described at pages 52-54, 56-57, and 59-63 of the 2018 Business Plan and Budget. The RRM group carries out the ERO’s responsibility to perform assessments (including real-time and near-real-time continual awareness, detailed analysis of significant events, and longer-term broad performance assessments) of the reliability and adequacy of the BES, including identifying potential issues of concern

relating to system, equipment, entity, and human performance. RRM has six primary functions: (1) BES awareness, (2) event analysis and determination of root and contributing causes, (3) assessment of human performance challenges that affect BES reliability and identification of improvement opportunities, (4) continent-wide analysis and reporting of BES performance, (5) support of the NERC Operating Committee, and (6) support of the NERC CIPC. Through awareness and continuous assessment, RRM identifies potential reliability risks to the BES, analyzes events in detail, ensures that industry is well informed of system events, emerging trends, risk analysis, and lessons learned, and provides data and analysis to inform other aspects of NERC's statutory functions.

The Situation Awareness department along, with the Regional Entities, monitors BES conditions, significant occurrences and emerging risks, and threats across the 14 Reliability Coordinator regions in North America. Situation Awareness also supports development and publication of NERC Alerts and awareness products, and facilitates information sharing among industry, Regions and government during crisis situations and major system disturbances. Situation Awareness is engaged in enhancement, replacement, streamlining or modification of several reliability-related situation awareness and monitoring tools, including SAFNRv2, operation and maintenance pending replacement of the current secure NERC Alert tool, refreshing the Reliability Coordinator Information System application, and continuing to set conditions to bring limited Synchrophasor data into NERC for wide-area situational awareness and event triage applications. The Situation Awareness Department uses the following reliability-related tools to support its activities: Resource Adequacy (ACE Frequency) Tool; Inadvertent Interchange; Frequency Monitoring and Analysis Tool; Intelligent Alarms Tool; and Genscape (PowerIQ and PowerRT tools).

The ongoing and new major activities of the Situation Awareness department for 2018 include: ensuring that the ERO is aware of all BES events above a threshold of impact; enabling the sharing of information and data to facilitate wide area situational awareness; during crisis situations, facilitating the exchange of information among industry, Regions, and U.S. and Canadian governments; keeping the industry informed of emerging reliability threats and risks to the BES, including any expected actions; conducting the annual NERC Monitoring and Situational Awareness Conference and Human Performance Conference; administering the NERC Alerts process as specified in §810 of the ROP to issue Advisory (Level 1) Alerts on significant and emerging reliability and security related topics, and facilitate the tracking of actions specified in Recommendation (Level 2) and Essential Action (Level 3) Alerts; and performing oversight as per the Situation Awareness Oversight Plan of the activities and performance of the Regional staffs.

The Event Analysis department performs assessments of the reliability and adequacy of the BES to identify potential issues of concern related to system, equipment, entity, and human performance that may indicate a need to develop remediation strategies, action plans, or data used to revise Reliability Standards or consider new Reliability Standards. Event Analysis conducts analyses to determine the causes of events, promptly assures tracking of corrective actions to prevent recurrence, and provides lessons learned to the industry. Event Analysis analyzes all reportable events for sequence of events, root cause, risks to reliability, and mitigation and keeps the industry is well-informed of system events, emerging trends, risk analysis, lessons learned, and expected actions. Event Analysis conducts in-depth analyses of approximately 150 events per year on average. Additionally, Event Analysis identifies human error risks and precursor factors that allow human error to affect BES reliability, and educates industry regarding such risks, precursors, and related mitigation methods. Event analysis also supports compliance and standards training initiatives and trending and analysis to identify emerging reliability risks to the BES. Event Analysis works in collaboration with and supports the activities of other groups involved in human performance analysis including the NERC Operating Committee's Event Analysis Subcommittee, the WECC

Human Performance Working Group, and others. Event Analysis also collaborates with industry groups including the NATF, NAGF, and trade associations.

The ongoing and new major activities for 2018 for the Event Analysis department include: (1) Working with Regional Entities to obtain and review information from registered entities on qualifying events and disturbances in order to advance awareness of events above a threshold level; facilitating analysis of root and contributing causes, risks to reliability, wide area assessments and remediation efforts; and disseminating information regarding events in a timely manner. (2) Ensuring that all reportable events are analyzed for sequence of events, root cause, risk to reliability, and mitigation. (3) Continuing to refine risk-based methodologies to support better identification of reliability risks, including use of more sophisticated cause codes for analysis. (4) Conducting training (webinars, workshops and conference support) to inform industry and the ERO of lessons learned, root cause analysis, trends, human performance, and extreme weather preparedness and recommendations. (5) Developing reliability recommendations and alerts as needed, and tracking industry accountability for critical reliability recommendations. (6) Ensuring that industry is well informed of system events, emerging trends, risk analysis, lessons learned, and expected actions. (7) Conducting major event analysis and reporting of major findings and recommendations that will improve reliability. (8) Performing oversight of the event-analysis-related activities and performance of the Regional Entities. The Event Analysis department will also support several top priority reliability risk projects being led by the Performance Analysis program.

Performance Analysis, which consists of Balancing and Frequency Control (BF&C) and Data Analytics (DA), provides statistical analysis and support to the ERO Enterprise, as well as through outreach to highly technical electric industry organizations. PA collects transmission outage, generator performance, demand response, and protection and control systems misoperations data; this data is used to develop and report grid metrics that analyze outage frequency, duration, causes, and other factors related to transmission and generator performance and automatic power system protection and control effectiveness. Trends, findings and recommendations from PA serve as technical input to Reliability Standards and to standards project prioritization, compliance process improvements, event analysis, reliability assessment, and critical infrastructure protection efforts. The analysis and results are reported in the annual State of Reliability Report, which provides guidance and recommendations for enhanced BPS reliability. Performance Analysis works closely with other organizations, including EPRI, DOE, IEEE, INPO, NATF, NAGF, and CEA, on a number of fronts, including the Transmission Availability Data System (TADS), Generator Availability Data System (GADS), and Demand Response Availability Data System (DADS).

BF&C provides support and services necessary for the real-time operation of the BPS in the areas of balancing resources and demand, interconnection frequency, interchange scheduling, and control performance. BF&C provides technical assistance in the development and administration of the NERC Balancing (BAL) standards, including BAL-01, BAL-002, BAL-003, BAL-004 and BAL-006, as well as in performing analysis and developing annual reports and informational filings required by FERC directives in its orders that approved BAL standards. BF&C supports the NERC Resources Subcommittee (RS), Frequency Working Group, Inadvertent Exchange Working Group and Reserves Working Group, including through maintaining the RS website and the Balancing Authority Submittal Site, which provide operational information and a submittal mechanism for requirements under the BAL standards. BF&C also provides data collection, analysis and reporting for five Essential Reliability Services (ESR) measures to support the ESR Working Group. BF&C is involved in the specification, development and installation of a PI Historian system that will allow NERC to retrieve, analyze and report on data that is currently hosted and analyzed by external parties; this initiative will continue in 2018. BF&C provides data and analysis that supports development of the annual State of Reliability Report. BF&C will continue to support the RS, the ERS Working Group, and industry stakeholders through webinars, technical whitepapers, reliability guidelines,

and other outreach. In 2018, BF&C will develop the technical report to be filed with FERC in accordance with the directives in FERC Order 794, which approved the BAL-003-1 standard, and will continue to develop the annual Frequency Response Annual Analysis Report.

DA is responsible for collection, management and analysis of data related to the performance of five areas of BPS operations: transmission, conventional generation, wind generation, protection system misoperations and demand response. DA provides application training and end-user support to reporting entities and Regional Entity staffs. DA performs analysis to identify potential risks relating to system, equipment, entity or organizational performance that may indicate, among other things, a need to develop remediation strategies, new data collection or analysis, or creation, revision or retirement of reliability standards. DA's analyses provide the foundation for the annual State of Reliability Report, the annual Misoperations report, and technical papers for industry. During 2017, DA is deploying the Wind Data collection system and developing and implementing the data sharing process to comply with FERC Order 824. In 2018, DA will begin development of requirements for solar data collection. DA also provides business subject matter expertise for NERC IT projects including new data reporting and analytical tools, projects to support FERC data needs, data sharing within the ERO, and other projects with NERC groups.

New and ongoing major activities for Performance Analysis in 2018 will include: issuing the annual State of Reliability Report and guidelines, recommendations and Alerts as needed; providing support and leadership to the NERC Operating Committee, Operating Reliability Subcommittee and the RS and its working groups, with emphasis on balancing operations and analysis, administration of BAL standards, and performance-based outreach to functional entities responsible for real-time BPS reliability; continuing administration of the BAL standards; providing technical assistance to NERC Compliance and Enforcement, emphasizing BAL-003-1 Frequency response for the Balancing Authority requirements that became effective in 2017; developing the annual Frequency Response Annual Analysis Report (previously the responsibility of the NERC RASA program); developing and submitting the report required by FERC Order 794; beginning development of quarterly BPS performance reports using PI Historian data and functionality to support the Operating Committee and the RS; overseeing and evaluating reliability trends that identify reliability risks, by analyzing data contained in the TADS, GADS and DADS; continuing to support the RS and its working groups of the Operating Committee with emphasis on data collection and analysis and implementation of the ERO's responsibilities for the BAL standards; supporting Reliability Standards development by providing subject matter expertise; continuing to provide leadership and support to the NERC standing committees' subcommittees, working groups, and task forces; assisting in development of approaches to registration and providing input to NERC staff in support of development of CMEP risk elements; conducting major event investigations, analyses, and reporting of major findings, recommendations and lessons learned that will improve reliability; and providing insight on merging system protection issues, and handing off any issues with future implications to RASA.

The major activities of the RRM group satisfy the following criteria:

I.A: is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC ROP?

I.C.1: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated, such as: (1) Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or

identifying approaches to mitigating or eliminating such risks? (2) Monitoring, event analysis and investigation of Bulk Power System major events, off-normal occurrences and near miss events?

I.C.2: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated, such as: (2) Monitoring, event analysis and investigations of Bulk Power System major events, off-normal occurrences and near-miss events?

II.A: Is the activity necessary or appropriate for the identification and registration of users, owners, and operators of the Bulk Power System that are required to comply with Requirements of Reliability Standards applicable to the reliability functions for which they are registered?

II.E: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information to monitor and enforce compliance with Reliability Standards, including evaluating the effectiveness of current compliance monitoring and enforcement processes, the need for new or revised compliance monitoring and enforcement processes, and the need for new or different means of training and education on compliance with Reliability Standards, such as: (1) Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks? (2) Monitoring, event analysis and investigation of Bulk Power System major events, off-normal occurrences, and near miss events?

II.F.3: Is the activity necessary or appropriate for the provision of training, education and dissemination of information for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel with respect to compliance monitoring and enforcement topics and topics concerning reliability risks identified through compliance monitoring and enforcement activities, such as: (3) Disseminating, through workshops, webinars, Advisories, Recommendations, Essential Actions, and other publications; “lessons learned” information on compliance concerns and reliability risks obtained through compliance monitoring and enforcement activities; monitoring and investigation of Bulk Power System major events, off-normal occurrences and near miss events, and other Bulk Power System monitoring activities?

II.G: Is the activity necessary or appropriate for the development and provision of tools and services that are useful for the provision of adequate reliability, because they relate specifically to compliance with existing Reliability Standards and they proactively help avert Reliability Standard violations and Bulk Power System disturbances?

III.A: Is the activity necessary or appropriate for the preparation or dissemination of long-term, seasonal, and special assessments of the reliability and adequacy of the Bulk Power System?

III.B: Is the activity necessary or appropriate for measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?

III.C: Is the activity necessary or appropriate for investigating, analyzing, evaluating, and disseminating information concerning, the causes of major events and off-normal occurrences, and/or providing coordination assistance, technical expertise and other assistance to users, owners, and operators of the Bulk Power System in connection with Bulk Power System major events and off-normal occurrences, but not real-time operational control of the Bulk Power System?

III.D: Is the activity necessary or appropriate for awareness of circumstances on the Bulk Power System and to contribute to understanding risks to reliability?

III.F: Is the activity necessary or appropriate for the development and dissemination of Advisories/Recommendations/Essential Actions regarding lessons learned and potential reliability risks to users, owners, and operators of the Bulk Power System?

III.G: Is the activity necessary or appropriate for data collection and analysis of information regarding Bulk Power System reliability matters mandated by the Commission?

IV: Is the activity one that was required or directed by a Commission order issued pursuant to FPA §215? (The applicable Commission orders include Order Nos. 794 and 824 which require data collection, availability and reporting.)

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC's ROP that have been approved by the Commission as "Electric Reliability Organization Rules" (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provisions for these major activities are §801-811 and 1001 and Appendix 8.)

IX. Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?

VI. Electricity Information Sharing and Analysis Center 2018 Major Activities

The major activities of the Electricity Information Sharing and Analysis Center ("E-ISAC") are described at pages 65-68 of the 2018 Business Plan and Budget. The primary function of E-ISAC is to reduce cyber and physical risk to the electricity industry across North America by providing unique insights, leadership and coordination, and to be the trusted, timely, actionable resource of grid risk information and analysis to enhance electric reliability. The E-ISAC facilitates electricity sector coordination regarding physical security and cybersecurity events affecting the BES. E-ISAC manages and executes NERC's responsibilities in the Cybersecurity Risk Information Sharing Program ("CRISP") and acts as the program manager for CRISP. The purpose of CRISP is to facilitate the sharing of cyber threat information and to develop situation awareness tools that enhance the electricity sector's ability to identify, prioritize, and coordinate protection of its critical infrastructure. CRISP provides critical infrastructure owners and operators the capability to voluntarily share cyber threat data, analyze this data, and receive machine-to-machine messages. E-ISAC also supports an annual grid security conference and a biennial Grid Security Exercise. The E-ISAC and CRISP are currently working on replacement of the E-ISAC portal to provide important new enhancements and improved capabilities, including facilitating direct data exchanges with E-ISAC members, other ISACs, and government partners.

The major activities of the ES-ISAC satisfy the following criteria:

I.C.1: Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated, such as: (1) Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks? (2) Monitoring, event analysis and investigation of Bulk Power System major events, off-normal occurrences and near-miss events?

III.D: Is the activity necessary or appropriate for awareness of circumstances on the Bulk Power System and to contribute to understanding risks to reliability.

III.E: Is the activity necessary or appropriate for gathering, analyzing and sharing with and among industry and government participants, information regarding the physical or cyber security of the Bulk Power System.

III.F: Is the activity necessary or appropriate for the development and dissemination of Advisories/Recommendations/Essential Actions regarding lessons learned and potential reliability risks to users, owners, and operators of the Bulk Power System?

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC's ROP that have been approved by the Commission as "Electric Reliability Organization Rules" (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provisions for these major activities are §810 and 1003.)

IX. Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?

VII. Training, Education, and Personnel Certification Program 2018 Major Activities

The major activities of the Training, Education, and Personnel Certification Program are described at pages 71-73 of the 2018 Business Plan and Budget. The major activities of this program include oversight and coordination of the delivery of training programs to NERC and Regional Entity staff supporting statutory and delegation-related activities; as well as training and education for BPS industry participants consistent with ERO functional program requirements. The Training and Education Program supports the ERO's responsibilities to develop, adopt, and obtain approval of Reliability Standards and to monitor, enforce and achieve compliance with the mandatory standards. The Training and Education Program also supports NERC's System Personnel Certification Program, which ensure that personnel operating the BES have the skills, training and qualifications needed to operate the BES reliably. This Program maintains the credentials required to work in various industry areas across North America for over 7,500 system operators. The Training and Education Program prepares operators for complying with requirements of Reliability Standards and appropriately operating the BES during normal and emergency operations. Education and training activities include the following subject matter: risk-based compliance monitoring and enforcement; standards and compliance; organization registration and certification; event analysis, cause analysis, performance analysis, and lessons learned; reliability assessment and system analysis; and continuing education for system operators; as well as continuing to update the System Operator Certification Exam Item Bank.

The major activities of the Training, Education, and Personnel Certification Program for 2018 include implementing the annual NERC and ERO Enterprise Learning Priorities Plan which articulates and prioritizes the accumulated learning needs of the ERO Enterprise and the potential delivery vehicles supporting achievement of the corporate metrics for the strategic goals. The focus for 2018 (and beyond) includes reliability risk management technique (targeting industry), risk-based compliance performance (targeting the ERO Enterprise), and functional and technical enhancements to enhance employee understanding of NERC functions and core technical knowledge for regulating the BPS (targeting NERC employees). Training and education will be delivered through workshops, webinars, and computer-based and instructor-led training courses. The Continuing Education program will evaluate and revise current program criteria as reflected in the program manual. The Personnel Certification Program will focus on the annual analysis of the Exam Item Bank; new certification exam items; a new credential maintenance tool; and the strategic plan for program enhancements.

The major activities of the Training, Education, and Personnel Certification Program satisfy the following criteria:

I.D: Is the activity necessary or appropriate for the provision of training and education concerning Reliability Standards development processes, procedures and topics for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel?

II.C: Is the activity necessary or appropriate for the Certification of system operating personnel as qualified to carry out the duties and responsibilities of their positions in accordance with the Requirements of applicable Reliability Standards?

II.F: Is the activity necessary or appropriate for the provision of training, education and dissemination of information for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel with respect to compliance monitoring and enforcement topics and topics concerning reliability risks identified through compliance monitoring and enforcement activities, such as: (1) Requirements of Reliability Standards, including how to comply and how to demonstrate compliance? This includes development of guidance and interpretation documents. (2) Compliance monitoring and enforcement processes, including how to conduct them, how to participate in them, and the expectations for the processes? This includes development of guidance documents. (3) Disseminating, through workshops, webinars, Advisories/Recommendations/Essential Actions, and other publications, “lessons learned” information on compliance concerns and reliability risks obtained through compliance monitoring and enforcement activities, monitoring and investigation of Bulk Power System major events, off-normal occurrences and near miss events, and other Bulk Power System monitoring activities. (4) Registered Entity internal processes for compliance with Reliability Standards, such as development, implementation and maintenance of internal reliability compliance programs?

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC’s ROP that have been approved by the Commission as “Electric Reliability Organization Rules” (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provision for these major activities are §600 and 900.)

VI: Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and applicable provisions of Commission orders?

VIII. Administrative Services 2018 Major Activities

NERC's Administrative Services Departments are Technical Committees and Member Forums (for which no funding for activities is budgeted for 2018), General and Administrative, Legal and Regulatory, Information Technology ("IT"), Human Resources, and Finance and Accounting. The major activities of these departments are described at pages 76-85 of the 2018 Business Plan and Budget.

General and Administrative includes the administration and general management of the organization, the Chief Executive Officer and Chief Reliability Officer, Board of Trustees costs, communications, external affairs and government relations, and office rent.

Legal and Regulatory provides legal support to the organization, including to management, and the Reliability Standards, Compliance Analysis, Organization Registration and Certification, Reliability Risk Management, and RASA Programs, as well as general corporate legal support in areas including antitrust, corporate, commercial, insurance, contracts, employment, real estate, copyright, tax, and other areas.

IT supports NERC's computing, Internet, database and electronic data storage and maintenance, and telecommunications and internet needs, programs, applications and infrastructure, including management of the development and implementation of new software applications and infrastructure. The capital expenditure projects managed by IT represent capital expenditures in hardware, software and associated tools to securely gather, store, analyze and maintain data across the ERO Enterprise to support the ERO's operations, as well as necessary acquisition and replacement of computers, servers and related devices. IT's 2018 activities are focused on NERC infrastructure and support; improving, enhancing, or replacing existing functionalities; ERO Enterprise infrastructure and support; and ERO Enterprise new functionalities, including entity registration functions and compliance monitoring and enforcement process tools.

Human Resources manages all of NERC's human resources functions, including staffing, benefits administration, employee relations, performance and compensation management, succession planning, and training and development. Human Resources also obtains compensation studies, effectiveness studies, and other compensation consulting services when needed.

Finance and Accounting manages all finance and accounting functions of NERC, including employee payroll, 401(k), 457(b) and 457(f) plans, travel and expense reporting, monthly financial reporting, sales and use tax, meetings and events planning and services, insurance, internal audit, facilities management, development of the annual business plan and budget, and the ERO risk management framework.

The major activities of NERC's Administrative Services Departments satisfy the following criteria:

I.A: Is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC ROP?

II.A: Is the activity necessary or appropriate for the identification and registration of users, owners, and operators of the Bulk Power System that are required to comply with Requirements of Reliability Standards applicable to the reliability functions for which they are registered?

II.D: Is the activity necessary or appropriate for conducting, participating in or overseeing compliance monitoring and enforcement activities pursuant to the NERC ROP and (through the Regional Entities) the Commission-approved delegation agreements?

III.C: Is the activity necessary or appropriate for investigating, analyzing, evaluating, and disseminating information concerning, the causes of major events and off-normal occurrences, and/or providing coordination assistance, technical expertise and other assistance to users, owners, and operators of the Bulk Power System in connection with Bulk Power System major events and off-normal occurrences, but not real-time operational control of the Bulk Power System?

V: Is the activity one that is required or specified by, or carries out, the provisions of NERC's ROP that have been approved by the Commission as "Electric Reliability Organization Rules" (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)? (The applicable ROP provision for the major activities of Finance and Accounting is §1100.)

VI: Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and the applicable provisions of Commission orders.

IX. Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?

XI: Is the activity a governance or administrative/overhead function, activity or service necessary or appropriate for the activities encompassed by the other criteria and, in general, necessary and appropriate to operate a functioning organization?

**NERC WRITTEN CRITERIA FOR DETERMINING
WHETHER AN ACTIVITY IS ELIGIBLE TO BE FUNDED
UNDER SECTION 215 OF THE FEDERAL POWER ACT**

For purposes of internal management approval of a proposed new activity or group of related activities (“major activity”), the proposed activity or major activity must be shown to fall within at least one of the criteria listed below. When sub-criteria are listed below a roman numeral numbered major criterion, the proposed activity should be a positive answer to at least one of the sub-criteria. Conversely, an activity that falls under a sub-criterion should pertain to the subject matter of the major criterion.

NERC’s annual business plan and budget will describe how each major activity falls within one or more of the criteria listed below. If the major activity is substantially the same as a major activity that was shown to fall within the criteria in a previous year’s business plan and budget, the current year’s business plan and budget can refer to the prior year business plan and budget.

A determination that an activity falls within FPA §215 does not necessarily mean that NERC will propose or undertake such activity. The determination of whether an activity falling under FPA §215 should or will be undertaken in a given budget year will be addressed in the context of the applicable business plan and budget and will include opportunities for stakeholder input.

The criteria listed below are not necessarily each distinct from the others. An activity or major activity may fall within more than one of the criteria listed below.

- I. Is the activity necessary or appropriate for the development of Reliability Standards?
 - A. Is the activity necessary or appropriate for Reliability Standards development projects pursuant to the NERC ROP?
 - B. Is the activity necessary or appropriate for providing guidance and assistance to Regional Entities in carrying out Regional Reliability Standards development activities?
 - C. Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information for Reliability Standards development, including for purposes of identifying areas in which new Reliability Standards could be developed, existing Reliability Standards could be revised, or existing Reliability Standards could be eliminated, such as:
 1. Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System⁴⁹ based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?
 2. Monitoring, event analysis and investigation of Bulk Power System major events, off-normal occurrences and near miss events?
 - D. Is the activity necessary or appropriate for the provision of training and education concerning Reliability Standards development processes, procedures and topics for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel?
- II. Is the activity necessary or appropriate for the monitoring and enforcement of compliance with Reliability Standards?
 - A. Is the activity necessary or appropriate for the identification and registration of users, owners, and operators of the Bulk Power System that are required to comply with

⁴⁹ This document uses the term “Bulk Power System” because that is the term defined and used in FPA §215. NERC recognizes that a different term, “Bulk Electric System,” is used to define the current reach of reliability standards.

Requirements of Reliability Standards applicable to the reliability functions for which they are registered?

- B. Is the activity necessary or appropriate for the Certification of Reliability Coordinators, Transmission Operators and Balancing Authorities as having the requisite personnel, qualifications and facilities and equipment needed to perform these reliability functions in accordance with the applicable Requirements of Reliability Standards?
- C. Is the activity necessary or appropriate for the Certification of system operating personnel as qualified to carry out the duties and responsibilities of their positions in accordance with the Requirements of applicable Reliability Standards?⁵⁰
- D. Is the activity necessary or appropriate for conducting, participating in or overseeing compliance monitoring and enforcement activities pursuant to the NERC ROP and (through the Regional Entities) the Commission-approved delegation agreements?
- E. Is the activity necessary or appropriate for information gathering, collection and analysis activities to obtain information to monitor and enforce compliance with Reliability Standards, including evaluating the effectiveness of current compliance monitoring and enforcement processes, the need for new or revised compliance monitoring and enforcement processes, and the need for new or different means of training and education on compliance with Reliability Standards, such as:
 - 1. Measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?
 - 2. Monitoring, event analysis and investigation of Bulk Power System major events, off-normal occurrences, and near miss events?
- F. Is the activity necessary or appropriate for the provision of training, education and dissemination of information for/to (i) NERC personnel, (ii) Regional Entity personnel, and (iii) industry personnel with respect to compliance monitoring and enforcement topics and topics concerning reliability risks identified through compliance monitoring and enforcement activities, such as:
 - 1. Requirements of Reliability Standards, including how to comply and how to demonstrate compliance? This includes development of guidance and interpretation documents.
 - 2. Compliance monitoring and enforcement processes, including how to conduct them, how to participate in them, and the expectations for the processes? This includes development of guidance documents.
 - 3. Disseminating, through workshops, webinars, Advisories, Recommendations, Essential Actions, and other publications; “lessons learned” information on compliance concerns and reliability risks obtained through compliance monitoring and enforcement activities; monitoring and investigation of Bulk Power System major events, off-normal occurrences and near miss events, and other Bulk Power System monitoring activities?

⁵⁰ Although certification of system operating personnel is an activity falling within the scope of, and eligible to be funded pursuant to, FPA §215, NERC strives to fully fund the costs of this activity through fees charged to participants.

4. Registered Entity internal processes for compliance with Reliability Standards, such as development, implementation and maintenance of internal reliability compliance programs?
 - G. Is the activity necessary or appropriate for the development and provision of tools and services that are useful for the provision of adequate reliability, because they relate specifically to compliance with existing Reliability Standards and they proactively help avert Reliability Standard violations and Bulk Power System disturbances?
- III. Is the activity necessary or appropriate for conducting and disseminating periodic assessments of the reliability of the Bulk Power System or monitoring the reliability of the Bulk Power System?
- A. Is the activity necessary or appropriate for the preparation or dissemination of long-term, seasonal, and special assessments of the reliability and adequacy of the Bulk Power System?
 - B. Is the activity necessary or appropriate for measuring reliability performance – past, present and future; publishing or disseminating the results of such measurements; analyzing the results of such measurements; identifying and analyzing risks to reliability of the Bulk Power System based on such measurements; and/or identifying approaches to mitigating or eliminating such risks?
 - C. Is the activity necessary or appropriate for investigating, analyzing, evaluating, and disseminating information concerning, the causes of major events and off-normal occurrences, and/or providing coordination assistance, technical expertise and other assistance to users, owners, and operators of the Bulk Power System in connection with Bulk Power System major events and off-normal occurrences, but not real-time operational control of the Bulk Power System?
 - D. Is the activity necessary or appropriate for awareness of circumstances on the Bulk Power System and to contribute to understanding risks to reliability?
 - E. Is the activity necessary or appropriate for gathering, analyzing and sharing with and among industry and government participants, information regarding the physical or cyber security of the Bulk Power System?
 - F. Is the activity necessary or appropriate for the development and dissemination of Advisories/Recommendations/Essential Actions regarding lessons learned and potential reliability risks to users, owners, and operators of the Bulk Power System?
 - G. Is the activity necessary or appropriate for data collection and analysis of information regarding Bulk Power System reliability matters mandated by the Commission?
- IV. Is the activity one that was required or directed by a Commission order issued pursuant to FPA §215? Justification of an activity as a FPA §215 activity based on this category must reference the particular Commission order and directive.
- V. Is the activity one that is required or specified by, or carries out, the provisions of NERC’s ROP that have been approved by the Commission as “Electric Reliability Organization Rules” (defined in 18 C.F.R. §39.1) pursuant to FPA §215(f)?
- VI. Is the activity necessary or appropriate for the supervision and oversight of Regional Entities in the performance of their delegated responsibilities in accordance with FPA §215, 18 C.F.R. Part 39, the Commission-approved delegation agreement between NERC and the Regional Entity, the NERC ROP, and applicable provisions of Commission orders?

- VII. Is the activity necessary or appropriate to maintain NERC’s certification as the Electric Reliability Organization? This Criterion includes conducting periodic assessments of NERC’s and the Regional Entities’ performance as the Electric Reliability Organization as required by 18 C.F.R. §39.3(c).
- VIII. Does the activity respond to or is it necessary or appropriate for audits of NERC and the Regional Entities conducted by the Commission?
- IX. Is the activity necessary or appropriate for NERC and Regional Entity committees, subcommittees and working groups engaged in activities encompassed by one or more of the other criteria?
- X. Is the activity necessary or appropriate for the analysis and evaluation of activities encompassed by one or more of the other criteria for the purpose of identifying means of performing the activities more effectively and efficiently?
- XI. Is the activity a governance or administrative/overhead function, activity or service necessary or appropriate for the activities encompassed by the other criteria and, in general, necessary and appropriate to operate a functioning organization? (Should NERC perform any non-FPA §215 activities, the costs of governance and administrative/overhead functions must be appropriately allocated.)
NERC’s current governance and administrative/overhead functions are carried out in the following program areas:
 - A. Technical Committees and Members’ Forum Programs
 - B. General and administrative (includes, but is not limited to, executive, board of trustees, communications, government affairs, and facilities and related services).
 - C. Legal and Regulatory.
 - D. Information Technology
 - E. Human Resources
 - F. Accounting and Finance.

The following matters are excluded from the scope of FPA §215 activities. While a list of non-FPA §215 activities would be infinite, the following excluded matters are listed here because they are expressly referred to in FPA §215, the Commission’s ERO regulations and/or a Commission order issued pursuant to FPA §215:

- A. Developing or enforcing requirements to enlarge Bulk Power System facilities, or to construct new transmission capacity or generation capacity, or requirements for adequacy or safety of electric facilities or services.
- B. Activities entailing Real-time operational control of the Bulk Power System.
- C. Activities pertaining to facilities used in the local distribution of electricity.

Exhibit C – Contractor and Consulting Costs

Consultants & Contracts	2017 Budget	2018 Budget	Increase (Decrease)
Compliance Assurance			
Reliability Assurance Initiative	\$ 50,000	\$ 50,000	\$ -
Total	\$ 50,000	\$ 50,000	\$ -
Reliability Assessment and System Analysis			
Reliability Effects of GMD	\$ 100,000	\$ 100,000	\$ -
Environmental Regulatory Analysis	250,000	250,000	-
Probabilistic Analysis	75,000	75,000	-
Essential Reliability Services	100,000	100,000	-
Total	\$ 525,000	\$ 525,000	\$ -
Performance Analysis			
GADS/TADS/DADS	\$ 528,082	\$ 572,030	\$ 43,948
Total	\$ 528,082	\$ 572,030	\$ 43,948
Situation Awareness			
Reliability Tools	\$ 619,150	\$ 600,595	\$ (18,555)
Secure Alerting System	96,000	96,000	-
SAFNR - Phase II	505,700	523,900	18,200
Communication Network	75,000	75,000	-
Total	\$ 1,295,850	\$ 1,295,495	\$ (355)
E-ISAC			
Security Consulting	\$ 33,000	\$ 33,000	\$ -
GridEx Support	350,000	142,000	(208,000)
Program Level Capabilities	353,000	770,000	417,000
Software and Services	113,285	105,200	(8,085)
Events and Outreach	50,550	50,000	(550)
CRISP	5,888,594	6,291,594	403,000
Total	\$ 6,788,429	\$ 7,391,794	\$ 603,365
Personnel Certification			
System Operator Testing Expenses	\$ 62,000	\$ 58,500	\$ (3,500)
System Operator Examination Development	70,000	50,000	(20,000)
Job Task Analysis	-	42,000	42,000
SOCCEd Database Maintenance/License	37,800	25,200	(12,600)
SOCCEd Database Improvements	50,000	75,000	25,000
Total	\$ 219,800	\$ 250,700	\$ 30,900
Training and Education			
Continuing Education Program	\$ 145,800	\$ 133,200	\$ (12,600)
ERO Enterprise Learning Portal	55,000	103,150	48,150
ERO Enterprise and Industry Course Development	125,000	76,850	(48,150)
NERC Staff Technical Training	35,000	35,000	-
Total	\$ 360,800	\$ 348,200	\$ (12,600)
General and Administrative			
Communications Support	\$ 15,000	\$ 20,000	\$ 5,000
ERO Effectiveness Survey	-	80,000	80,000
Total	\$ 15,000	\$ 100,000	\$ 85,000
Information Technology			
ERO Application New Functionality	\$ 100,000	\$ -	\$ (100,000)
ERO Application Enhancements	387,262	425,989	38,727
ERO Application Support	774,525	851,977	77,452
ERO Data Analytics	200,000	-	(200,000)
Ongoing Operations	851,000	846,000	(5,000)
Total	\$ 2,312,787	\$ 2,123,966	\$ (188,821)
Human Resources			
Executive Training and Development	\$ 100,000	\$ 150,000	\$ 50,000
Staff Training and Development	250,000	250,000	-
Compensation Consulting	100,000	175,000	75,000
Employee, Industry and Board Surveys, Succession Planning	50,000	40,000	(10,000)
HR Consulting Services	75,000	25,000	(50,000)
Total	\$ 575,000	\$ 640,000	\$ 65,000
Finance and Accounting			
Internal Controls and Outside Auditor Consulting Support	\$ 300,000	\$ 220,000	\$ (80,000)
Finance and Accounting Support	157,000	207,000	50,000
Finance and Accounting	\$ 457,000	\$ 427,000	\$ (30,000)
Total Consultants & Contracts	\$ 13,127,749	\$ 13,724,185	\$ 596,437

Exhibit D – Capital Financing

The company initiated a capital financing program in January 2014 as a funding source for major software application development projects that primarily benefit the ERO Enterprise. The total size of the original non-revolving credit facility was \$7.5M and was used to finance a portion of NERC's capital expenditures (including IT hardware and software application development costs) made through December 2016. A similar non-revolving credit facility was closed in November 2016, totaling \$5.0 million, and is available to finance certain capital expenditures made from January 2017 to December 2019. The interest rate for both credit facilities is floating and equal to LIBOR plus 275 basis points. Authorized annual borrowings under the facilities are limited to the amount approved by the NERC Board of Trustees and FERC in each year's business plan. Borrowings under the credit facilities are amortized over a three year period, and can be prepaid without penalty.

As further discussed in the *Introduction and Executive Summary* and set forth in the table below, NERC has a 2018 proposed capital budget of approximately \$3.9M, of which it is proposing to finance \$2.1M.

NERC Capital Budget	Budget 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	
			Variance \$	Variance %
ERO Application Development	\$ 700,000	\$ 2,148,000	\$ 1,448,000	206.9%
E-ISAC Portal Improvement	1,000,000	-	(1,000,000)	-100.0%
Document Management Program	335,000	-	(335,000)	-100.0%
Hardware (storage, servers)	991,000	805,000	(186,000)	-18.8%
Other Equipment	885,000	370,000	(515,000)	-58.2%
Disaster Recovery	150,000	100,000	(50,000)	-33.3%
NERC Software Licenses	311,000	301,000	(10,000)	-3.2%
Leasehold Improvements	-	150,000	150,000	100.0%
Total	\$ 4,372,000	\$ 3,874,000	\$ (498,000)	-11.4%

The tables set forth below show the projected year-end outstanding debt and the future annual payments for debt service. In the 2018 budget, NERC plans to finance \$2.1M for ERO application development projects. The debt service projection assumes an average interest rate of 4.0% over the term of the financing, which is a slight increase over previous year budgets, reflecting the modest general increase occurring in interest rates.

	Year-End Outstanding Debt Balance				
	Prior Years Actual	2017 Projected	2018 Budget	2019 Projected	2020 Projected
Prior Years (2014 - 2016 Borrowing)	\$ 1,864,374	\$ 1,111,961	\$ 394,688	\$ -	\$ -
2017 Projection	-	1,450,000	966,667	483,333	-
2018 Budgeted	-	-	2,148,000	1,432,000	716,000
2019 Projected	-	-	-	2,668,000	1,778,667
2020 Projected	-	-	-	-	2,457,000
Total Outstanding Balance	\$ 1,864,374	\$ 2,561,961	\$ 3,509,354	\$ 4,583,333	\$ 4,951,667

Exhibit D – Capital Financing

	Future Annual Payments for Debt Service				
		2017 Projected	2018 Budget	2019 Projected	2020 Projected
Prior Years - Principal		\$ 752,413	\$ 717,274	\$ 394,688	\$ -
2017 Projection		-	483,333	483,333	483,333
2018 Budgeted		-	-	716,000	716,000
2019 Projected		-	-	-	889,333
2020 Projected		-	-	-	-
Interest Expense		64,544	88,878	121,744	155,335
Total Principal and Interest Costs	\$ -	\$ 816,956	\$ 1,289,485	\$ 1,715,765	\$ 2,244,002

Exhibit E – Working Capital and Operating Reserve Amounts

In September 2015, the Commission approved NERC’s proposed amendments to its *Working Capital and Operating Reserve Policy*, which had been approved by the NERC Board. A number of changes were made to the policy, including:

- Clarifying the definition of working capital to represent funding needed for cash flow purposes due to the timing of the receipt of funds and the payment of expenses.
- Creating four separate categories of operating reserves:
 1. A new subcategory of reserves entitled **Future Obligation Reserve** for funds that are being held to satisfy obligations that will be settled in a future year. Examples include leases, certain contracts, and credit agreements. These reserves were previously included within the definition of working capital, but are more accurately classified as a form of operating reserve.
 2. Continuation of a separate category of reserves for the Operator Certification Program called the **System Operator Certification Reserve**.
 3. Elimination of the Known and Unforeseen Contingency categories of operating reserves and creating a single category of contingency reserves called the **Operating Contingency Reserve**.
 4. Creation of a separate category of reserves for CRISP called the **CRISP Reserve**.

Working Capital

Based on its 2017 cash flow projection and taking into account the historic manner in which NERC’s assessments have been billed and paid, NERC does not anticipate needing access to working capital in 2018 to meet monthly cash flow needs. While individual reserve categories are increasing and decreasing based on operating needs and uses, the budget in total does not reflect additional net funding for reserves. In the unlikely event NERC experiences a temporary cash flow shortage, it has the ability to either request authorization from the Finance and Audit Committee and Board of Trustees to temporarily access operating contingency reserve funds, or draw on its \$4M line of credit, as long as NERC is in compliance with the covenants under its bank credit agreement.

Operating Reserves

Total operating reserves are budgeted to be \$5.9M at December 31, 2018 among all four categories, or \$5.4M excluding the \$500,000 CRISP Reserve. The Future Obligation Reserve is budgeted to be \$1.8M and is primarily funds held to offset future liabilities under lease agreements for the Atlanta and Washington, DC, offices. System Operator Certification Reserves are budgeted at \$700k, and the Operating Contingency Reserve is budgeted for \$3.0M. The CRISP Reserve, budgeted at \$500k, is held pursuant to the terms of the Master Services Agreement between NERC and participating utilities, which calls for a separate third-party funded reserve established to fund certain contingencies in connection with CRISP.

In addition to the foregoing reserves, the amended policy also provides for an **Assessment Stabilization Reserve**. The goal of the Assessment Stabilization Reserve is to mitigate assessment volatility and have percentage changes in annual assessments track, within a reasonable band, percentage changes in the company’s total annual budget, with the total budget reflecting prudent fiscal discipline and good stewardship of resources. Assessment stabilization funds will be used when available to help stabilize assessments and mitigate year-to-year swings in assessments. Those swings primarily result from the year-to-year variations in collections of Penalty funds to be applied to offset assessments, but could also result from other factors like surplus funds available from a prior period, the need to replenish the Operating Contingency Reserve, or significant but relatively short-term operating or capital spending needs. Subject to Commission approval, NERC proposes to (1) place the \$500,000 of Penalties collected in the 12 months ended June 30, 2017, into the Assessment Stabilization Reserve, resulting in a balance

on January 1, 2018 of \$2,171,000, funded entirely by penalties and (2) release \$600,000 from the Assessment Stabilization Reserve to reduce 2018 assessments. NERC's proposals will result in a balance remaining in the Assessment Stabilization Reserve of \$1,571,000 at December 31, 2018 (assuming that after June 30, 2017, no additional Penalties are received and placed into the Assessment Stabilization Reserve). This balance will be available to be used, with Board and Commission approval, to mitigate annual assessment increases in future years.

Exhibit F – E-ISAC Long-Term Strategy

2018 NERC Business Plan and Budget Addendum Long Term E-ISAC Strategy and Funding

Background and Introduction

Over the past several years the Electricity Information Sharing and Analysis Center (E-ISAC) has focused on improving its technical and analytical capabilities with a goal of becoming the electricity industry's leading, trusted source for analysis and sharing of security information. Significant support from the Electricity Subsector Coordinating Council (ESCC), the ESCC Members Executive Committee (MEC), the U.S. Department of Energy, and other stakeholders have helped the E-ISAC be responsive to the industry's needs in order to provide unique insights, leadership, and coordination for security matters.

In the fourth quarter of 2014 and with broad industry support, the E-ISAC assumed management responsibility for the Cybersecurity Risk Information Sharing Program (CRISP), a public-private partnership that facilitates the automatic sharing of cyber threat information. The CRISP program also develops situation awareness tools that enhance the electricity sector's ability to identify, prioritize, and coordinate the protection of its critical infrastructure. CRISP provides critical infrastructure owners and operators the capability to voluntarily share cyber threat data, analyze this data, and receive machine-to-machine mitigation measures. Information-sharing devices installed on participants' networks send encrypted data to a CRISP analysis center operated by the Pacific Northwest National Laboratory (PNNL), which analyzes the data it receives and sends alerts and mitigation measures back to CRISP participants and the E-ISAC through secure communication channels. Industry participation has increased significantly since CRISP became fully operational in 2015, and today the program supports the major utilities that serve about 75% of the metered electricity customers in the United States.

At the request of the NERC Board of Trustees and under the guidance of the ESCC and MEC, executive leadership of the E-ISAC developed a long-term strategic plan, a copy of which is attached hereto. The E-ISAC Long Term Strategic Plan was approved by the MEC on April 24, 2017 and accepted by the NERC Board of Trustees on May 11, 2017. The long-term strategic plan is to transform the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry.

In furtherance of this vision, the E-ISAC is planning for a continuous improvement and evolution that reflects the changing threat landscape, changing technologies and business processes inside the industry, and changing customer expectations for a highly reliable and secure electricity infrastructure that is increasingly more integrated with less secure infrastructures, such as the public Internet. This strategy recognizes the growing threats to the grid from human and cyber actors, and highlights the need for a more robust security information sharing and analysis capability within NERC, while also reflecting an approach based upon sound fiscal planning. To achieve this goal, the E-ISAC is focused on increasing its capability to collect security intelligence; conduct sophisticated and specialized analysis; acquire additional data storage, management, and sharing technologies; and increase its access to classified networks and facilities.

The following paragraphs discuss the additional future resource requirements necessary to support this long-term strategy, including the specific resource additions being proposed for 2018. Resource requirements for subsequent years will be subject to ongoing refinement, review and approval as part of NERC's annual business plan and budget process. Senior management will continue to work closely with the MEC to ensure that the capabilities and services provided are aligned with and support the strategic plan. Periodic progress reports will also be provided to the NERC Board of Trustees and industry stakeholders.

Increased Capabilities and Services

Improved Intelligence Collection, Analysis, and Information Sharing

The E-ISAC continues to improve the collection, analysis, and sharing of unclassified but sensitive information. New collection capabilities coming online in 2017, such as the E-ISAC's Cyber Automated Information Sharing System (CAISS) project and continued expansion of the Cybersecurity Risk Information Sharing Program (CRISP), will provide additional technical intelligence. As these technologies mature they will require increased staffing to screen, analyze, summarize, disseminate and maintain information shared with industry participants.

In 2018, the E-ISAC plans to implement additional monitoring (either directly or through the services of third parties) of public and private networks for new technical threats; and increase the ability to monitor social media and other open sources for human threats. Beyond 2018 the E-ISAC plans to launch a pilot project to begin collecting data from sensors in Operational Technology (OT) networks that will search for destructive threats.¹ These additional intelligence and information gathering capabilities will also require increased staffing to analyze and share security information derived from them.

Improved Analytical Capabilities

Sophisticated threat analysis requires technical analysts and tools with specializations in fields such as industrial control system security, end-point (host) security, network security, cloud security, and penetration testing.

In 2018, the E-ISAC plans to add data visualization capabilities to its portal technology that will assist members in understanding what threats are targeting them versus the broad sector; provide a malware reverse engineering capability; and be able to conduct remote testing of security perimeters and devices.

Measuring and understanding the impact of security controls and other actions taken to mitigate threats will be a new capability of the E-ISAC in 2018. In order to determine the effectiveness of NERC's reliability standards and other investments made by the electricity industry, the E-ISAC plans to deploy new technologies designed to measure the effectiveness of these security initiatives.

Beyond 2018, other analytical initiatives planned include adding big data analytics² to the CRISP and CAISS programs; the ability to verify device security through the use of passive attack tools; and developing customized control system security analysis tools. On the new portal platform, the E-ISAC plans to provide customized security monitoring and "plug-in" security modules for members that will allow them to define their own views of the security of their systems. This ability to view a member's own data and compare it to anonymized data from other members will be unique to the E-ISAC and the electricity industry.

Improved Industry Engagement

A major focus for the E-ISAC over the past two years has been improving our engagement with the electricity industry. The new portal platform being launched in 2017 is a core capability that will serve as a foundation for improved information sharing and new types of membership engagement.

In 2018, the E-ISAC plans to launch a robust reputation monitoring and warning capability for the members similar to the Domain Name System (DNS) monitoring project that was piloted in 2016; build and maintain a protected database of members' technical data including assigned Internet Protocol ranges, domain names, cloud service

¹ OT networks are typically separate from enterprise information technology networks and are used for controlling or monitoring machinery, relays, breakers, and other operational or control systems.

² Big data analytics refers to the ability to analyze very large repositories of data, looking for correlations of information that otherwise would appear to be unrelated.

providers, key applications, contact information and other critical member-specific data; provide on-site physical security guidance and incident analysis; and create a “cyber range”³ for members to support GridEx and other simulated training environments.

In future years, other engagement initiatives will include providing increased support to smaller industry members; creating cyber teams that can assist with on-site cyber security analytics; producing top quality training videos or online applications for various security subjects; and providing E-ISAC liaisons to other industry sector watch centers for better cross-sector collaboration.

Measuring Success

Measuring impact or direct changes to the security of the grid based on these new capabilities is difficult. The E-ISAC plans to provide quarterly updates to both the MEC and the NERC Board of Trustees highlighting the progress made on acquiring new personnel, deployment of new tools and technologies, and analysis of the impact on the industry as best as can be determined. As data is collected with the new tools, it will become possible to measure with increasing accuracy the direct impact on grid security. This analysis will assist the E-ISAC, the MEC, the NERC Board of Trustees, and other stakeholders in determining the impact of these improvements and identifying where improvements can be made.

Additional Resource Requirements

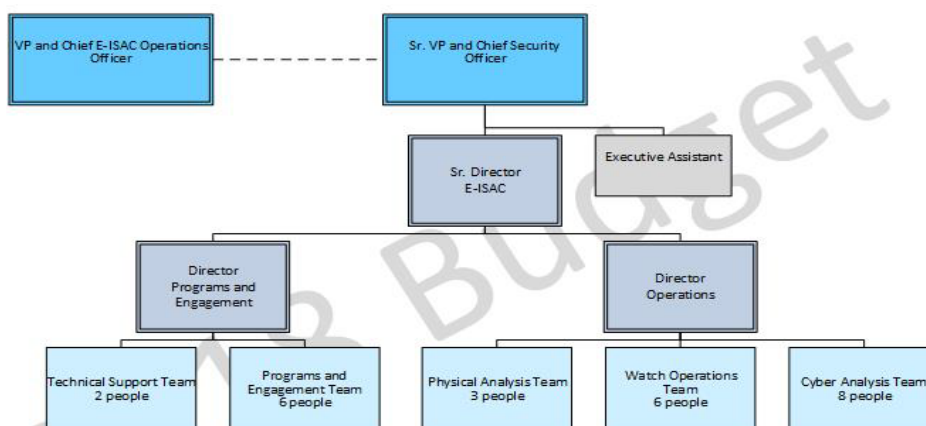
Personnel

The E-ISAC anticipates having 25 total employees by the end of 2017, including current staff and vacancies, along with 3 additional analyst positions as an initial step in the strategy. To meet the staffing levels recommended to fully execute the long-term strategic plan, the E-ISAC anticipates an additional 27 employees are needed. Management recommends these additional employees be phased-in over a five-year period in order to better facilitate the hiring, acquisition and integration of personnel, as well as to mitigate annual budget and assessment increases. In addition to these E-ISAC staff additions, additional corporate support resources will also be required, primarily related to information technology, legal, and finance. Projected resource additions for each year will also be subject to a review of the E-ISAC performance and progress in execution of the long-term strategy, as well as review and approval as part of NERC’s annual business plan and budget process.

In 2018, the E-ISAC proposes to hire an additional six employees at an estimated incremental cost of \$1.08 million. These six new positions include one watch officer, two cyber analysts, one CRISP analyst, one physical analyst, and an administrative support position. The performance of these additional employees and their impact on increasing the security of the grid will contribute to decisions for future levels of staff increases. With the addition of these six new positions, the E-ISAC’s 2018 organizational chart is as follows:

³ A “cyber range” is a simulated training environment for system administrators and network defenders that allows them to experiment with different types of defensive tools against different types of attackers. This approach is widely used in the military and with defense contractors, and will be a very powerful addition to the Electricity industry’s set of cyber defense tools.

Electricity Information Sharing and Analysis Center



Technology

As more data is collected, the E-ISAC will need to acquire additional data storage, management, and sharing technologies. These technologies must be as secure as possible, given that the risk of a targeted data breach will increase as the E-ISAC improves its capability to give early warning to industry about threats and vulnerabilities discovered via data analysis. The estimated annual incremental cost of new technologies each year over the next five years is estimated to range between \$250k to 500k per year.

Specific technologies needed to support the long-term plan in 2018 include event visualization via the new platform, predictive analysis based on artificial intelligence, real-time threat feeds to members, a customized platform experience for each user, and federated information sharing.

Other technologies to be added after 2018 include increased data storage capability with big data analytics for CRISP; tools for monitoring open source intelligence; malware reverse engineering tools; metrics development tools; passive security testing capability; reputation monitoring services; and increased network capacity between the E-ISAC and various Department of Energy laboratories.

Facility Improvements

As the size of the E-ISAC grows, ongoing facility improvements will be made each year over the next five years to accommodate these needs. Building on improvements made in 2017 there will be additional upgrades to the Watch Operations Center, the Cyber Analysis Center, and to the displays, monitors, workstations, and other fixed assets throughout the E-ISAC.

Total Projected Costs

The chart below shows the cost projections for personnel, technology and facility improvements over the next five years. These costs are the incremental costs expected in each year, not the accumulated costs over time.

E-ISAC Strategic Plan Cost Projections by Year

	E-ISAC Staffing	Technology and Tools	Other Staffing, Support, and Facilities*	Total Per Year
2018	\$ 1,080,000	\$ 500,000	\$ 225,000	\$ 1,805,000
2019	1,080,000	300,000	475,000	1,855,000
2020	900,000	250,000	175,000	1,325,000
2021	900,000	250,000	355,000	1,505,000
2022	900,000	450,000	355,000	1,705,000
Total	<u>\$ 4,860,000</u>	<u>\$ 1,750,000</u>	<u>\$ 1,585,000</u>	<u>\$ 8,195,000</u>

* This category includes administrative staff support outside the E-ISAC department, professional services costs, and costs related to facilities upgrades.

Funding Alternatives

The majority of NERC’s operations have traditionally been funded through assessments, which are allocated to load serving entities on a net energy for load basis. There are several exceptions to this general funding approach. NERC’s operator certification and training program is funded through testing fees, and the cost of certain conferences, including NERC’s Human Performance and Grid Security conferences, have been offset by registration fees. In addition, when CRISP was established, an agreement was reached with the CRISP participants that the costs incurred by NERC under its subcontract with PNNL should be entirely funded by CRISP participants, since these costs directly benefit the CRISP participants. However, since CRISP data is also used to provide threat information to registered users of the E-ISAC, it was recognized and agreed that funding a portion of the program through assessments was also appropriate. Since the program was new and E-ISAC resources would be utilized to analyze, anonymize and share CRISP data through the E-ISAC portal for the benefit of all users of the portal and load serving entities generally, a decision was made to share the funding of NERC’s internal costs to support CRISP equally between assessments and participants in the program.

For 2018, management is recommending that the proposed resource additions not related to the CRISP program be funded through assessments. The additional resources related to CRISP analytics will be included in the CRISP program budget and recommended for approval by those participants. As the E-ISAC resource requirements and associated funding needs continue to grow, management believes there is merit in continuing to explore alternative funding mechanisms, including the potential for public and private sector support, to fund future information technology and infrastructure needs.

The table below shows a "base" budget from 2018 through 2022, assuming growth of 3% and no significant staffing, technology, or facilities additions. For additional information on this “base” budget, see the E-ISAC section in the budget narrative. The “Added Costs” are based on the previous table showing the incremental costs per year related to this strategic plan. These costs are both accumulated (i.e. – staffing additions) and incremental (i.e. – one time technology tools or facilities expenditures) as necessary such that the 2022 “Strategic Plan Budget”

amount represents the total projected cost for that year to accommodate both the base operations and additional strategic plan costs discussed herein.

**E-ISAC
Total Budget including Strategic Plan**

	E-ISAC		Strategic Plan
	Base Budget*	Added Costs	Budget
2018	\$ 18,996,833	\$ 1,805,000	\$ 20,801,833
2019	19,566,738	3,235,000	22,801,738
2020	20,153,740	4,385,000	24,538,740
2021	20,758,352	5,715,000	26,473,352
2022	21,381,103	7,245,000	28,626,103

** The base budget for 2018 does not include any additional costs discussed in this Appendix. For additional information on the base budget, please see the E-ISAC section in the budget narrative. The 2019 thru 2022 include a 3% increase each year.*

Impact on 2018 NERC Budget and Assessments

All of these costs will be incremental to the proposed “base-case” NERC budget, and most of them will be incremental to the assessment increase. However, one of the additional analysts is allocated to CRISP and will be included in the 2018 budget for consideration by the CRISP participants. Therefore, as the table below reflects, the impact on the NERC budget is \$1.8M and the impact on assessments is \$1.7M, with the remaining \$90,000 related to the CRISP analyst position included with the CRISP budget for 2018 and funded accordingly.

The table below shows the impact of this strategy on the current NERC “base-case” budget, reflecting an increase to the budget of 5.1% (2.5% without these costs) and an increase in NERC assessments of 6.1% (3.3% without these costs). The table below does not include any releases from the Assessment Stabilization Reserve to offset the 2018 assessment billings. However, NERC is proposing to release \$600k from the Assessment Stabilization Reserve to offset 2018 assessment billings.

E-ISAC 2018 Budget and Assessment Impact

	2017	2018	Change	
			\$	%
NERC Budget (current base case)	\$ 69,602,175	\$ 71,376,999	\$ 1,774,824	2.5%
2018 E-ISAC strategic additions	-	1,805,000	-	-
NERC Budget - adjusted	\$ 69,602,175	\$ 73,181,999	\$ 3,579,824	5.1%
NERC Assessments (current base case)	\$ 59,856,314	\$ 61,804,211	\$ 1,947,897	3.3%
2018 E-ISAC strategic additions	-	1,715,000	-	-
NERC Assessments - adjusted	\$ 59,856,314	\$ 63,519,211	\$ 3,662,897	6.1%

Attachment

E-ISAC Long Term Strategic Plan

Executive Summary

The Electricity Information Sharing and Analysis Center (E-ISAC), operated by the North American Electric Reliability Corporation (NERC), executed a significant improvement initiative over the past two years based on findings and recommendations developed by the Electricity Subsector Coordinating Council (ESCC) in 2015. Looking forward, the electricity industry would like the E-ISAC to become an indispensable resource for security information sharing and analysis, and to be the centerpiece for building a highly engaged community of security professionals.

To carry forth this vision, the E-ISAC must undergo continuous improvement and evolution that reflects the changing threat landscape, changing technologies and business processes inside the industry, and changing customer expectations for a highly reliable and secure electricity infrastructure that is increasingly more integrated with insecure infrastructures such as the public Internet. This will require additional resources for people, technology, and facilities above what has been budgeted in previous years.

This strategic plan builds on the ESCC's earlier recommendations and discusses improvements needed in 2017 to address current threats, a look at the mid-term range of 2018-2022 to address emerging threats, and what the E-ISAC might look like beyond 2023 if the forecasted issues continue to develop.

The plan was developed with guidance from the ESCC and from NERC leadership. It recognizes the need for sound fiscal planning, recognizes the growing threats to the grid from human and cyber actors, and highlights the need for a more robust security information sharing and analysis capability within NERC.

At a recent planning session with C-level executives, one utility CEO said he wanted to "transform the EISAC into an intelligence collecting and analytical capability that industry literally cannot do without," which resonated strongly among the other executives. To achieve this goal we must get the E-ISAC to a maturity level where industry completely trusts it to gather, hold, analyze, and distribute highly sensitive security information.

Specific financial projections, technology requirements, staffing, and facility improvements are being developed and will be incorporated in the NERC strategic plan and the NERC business plan and budget.

Background

The Electricity Information Sharing and Analysis Center (E-ISAC) is operated by the North American Electric Reliability Corporation (NERC).⁵⁴ It was established by NERC at the request of the U.S. Department of Energy in 1999 to serve as a focal point for voluntary information sharing within the electricity subsector. By 2006, the ISAC was widely used in the subsector for collecting, analyzing, and distributing voluntarily-shared security information and was a key component of NERC's overall electric reliability mission. NERC's Board of Trustees oversees the budget and activities of the E-ISAC in the same manner as other NERC divisions.

NERC assumed the role of the Electric Reliability Organization (ERO) in 2006 and began a multi-year effort to develop enforceable reliability and security standards for owners, operators, and users of the Bulk-Power System. As the standards were completed and compliance monitoring began, the ISAC remained the place where security incidents were reported, but the voluntary nature of reporting from electricity entities shifted towards mandatory

⁵⁴ Initially called the Electricity Sector Information Sharing and Analysis Center (ES-ISAC), the name was changed in September 2015 to the Electricity Information Sharing and Analysis Center (E-ISAC) as part of a rebranding and role-clarification initiative.

reporting from entities required to be compliant with NERC’s Critical Infrastructure Protection (CIP) standards. By 2014, voluntary sharing with the E-ISAC had greatly diminished in favor of mandatory reporting, but the desire for voluntary sharing within the subsector remained strong. The following year a perceived problem of internal NERC cross-sharing of security information was addressed when NERC implemented the employee code of conduct that bars voluntarily shared security information from being forwarded to NERC’s compliance and enforcement teams. Also in 2015 the E-ISAC finished a separation project that includes physical and electronic barriers to protect the information voluntarily shared by industry members.

In late 2014, the Electricity Subsector Coordinating Council (ESCC) initiated a strategic review of the E-ISAC. In June 2015, the ESCC published its key findings and recommendations, which fell into four major areas of improvement for the E-ISAC:

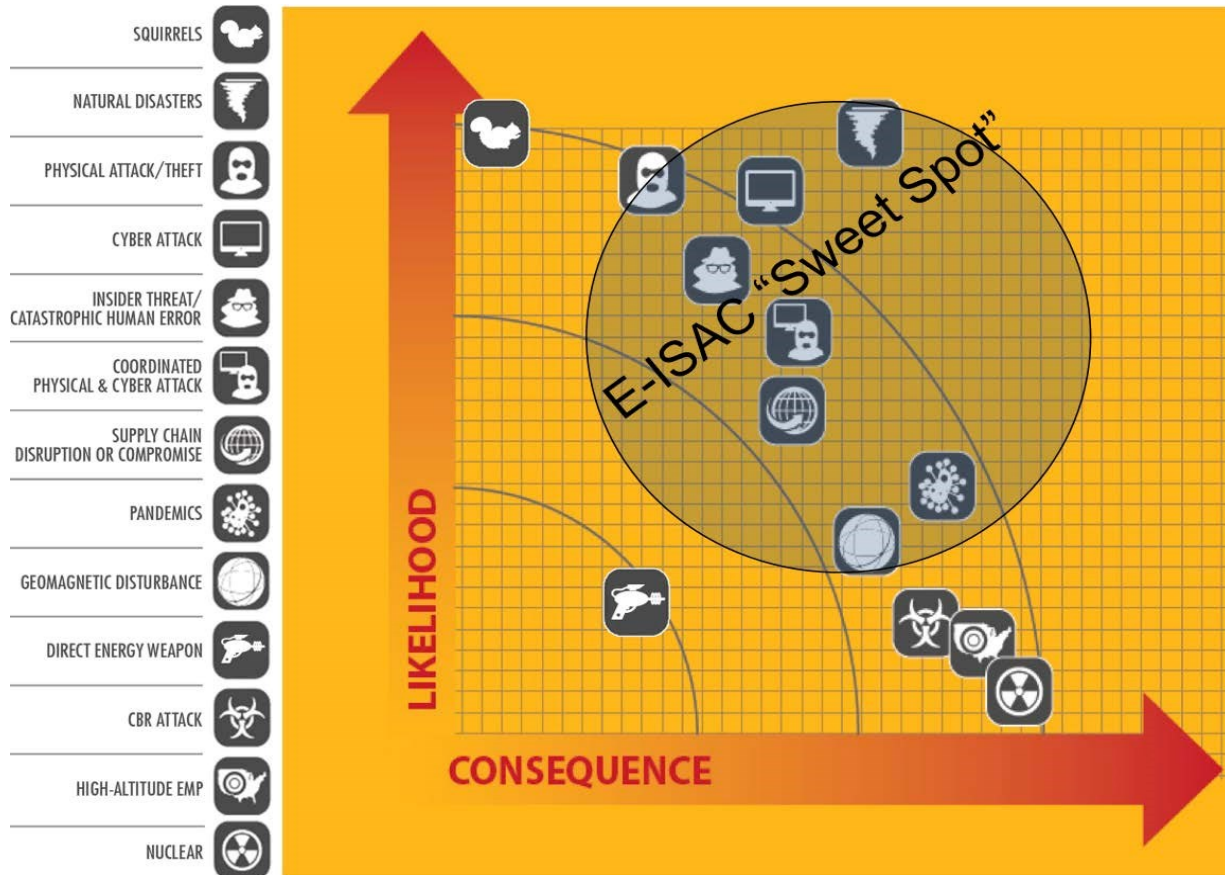
1. Strengthen the governance structure and processes to increase effectiveness and responsiveness
2. Improve the quality and value of the products by identifying member needs and expectations
3. Advance the analysis capabilities by continuing to upgrade operational and staff capabilities
4. Advance the information collection capabilities through enhanced member engagement, better tools or sensors, and an improved portal

A C-level advisory team from the ESCC (the Member Executive Committee, or MEC) was established in 2015 to help enable the implementation of the ESCC’s recommendations, which included a new vision for the E-ISAC to become the electricity industry’s leading, trusted source for analysis and sharing of security information. As of April 2017, much progress has been made toward realizing this vision and now we look forward to the next five years and beyond while asking the question, “how do we transform the E-ISAC into an intelligence collecting and analytical capability industry cannot do without?” To begin this process, the following section looks back at known threats and ahead at the anticipated evolving nature of future threats targeting the electricity industry.

The Changing Threat Landscape

A study conducted for the ESCC by the Chertoff Group in 2014⁵⁵ found that a range of threats target the electric power grid. These threats can be approximately related to each other by using a likelihood versus consequence plotting. We feel that the E-ISAC’s “sweet spot” is roughly along the 45-degree line as depicted in the graphic below.

⁵⁵ “Addressing Dynamic Threats to the Electric Power Grid Through Resilience” <https://www.chertoffgroup.com/files/docs/Addressing-Dynamic-Threats.compressed.pdf>



Industry by itself cannot protect the grid from all hazards, and likewise neither can the government. A strong partnership between industry and government for security is required, and in fact has been in place for many years. At the center of this partnership is the ESCC, which serves as a bridge between the public and private sectors for strategic security policy coordination and to develop unity of messaging during a crisis. In addition, timely and actionable information sharing, collaboration, and analysis are the cornerstones of good security practices within the electricity industry. The E-ISAC’s role is to facilitate voluntary sharing and collaboration, and to provide unique insights into emerging security issues that are affecting the sector. In January 2017 the E-ISAC and the MEC met in person to discuss the future of the E-ISAC relative to changing threats, changing industry dynamics, and a changing environment. While physical threats resulting in theft, vandalism, disruption, or destruction will always be present, the group recognized that cyber threats and other types of threats are evolving and will require adaptive change throughout industry and especially with respect to the E-ISAC. The group agreed that future threats industry needed to monitor and mitigate included:

- Near-term (0-2 years)
 - Nation state threats, advanced persistent threats, the Internet of Things (IoT), Distributed Denial of Service (DDoS) attacks, and ransomware
 - Data breaches and intellectual property theft
 - Insiders, physical damage, coordinated attacks, and third-party risks
- Mid-term (3-5 years)
 - Increased reliance on gas generation
 - Distribution system vulnerabilities via networked control systems
 - Growth of demand response technologies with low security
 - Distributed energy resources
 - Reliability of communications networks

- Long-term (5-10 years)
 - Higher replacement rate of components and systems
 - Increased cost of operations due to higher security costs
 - Ability to run manually might be lost
 - Computers attacking computers

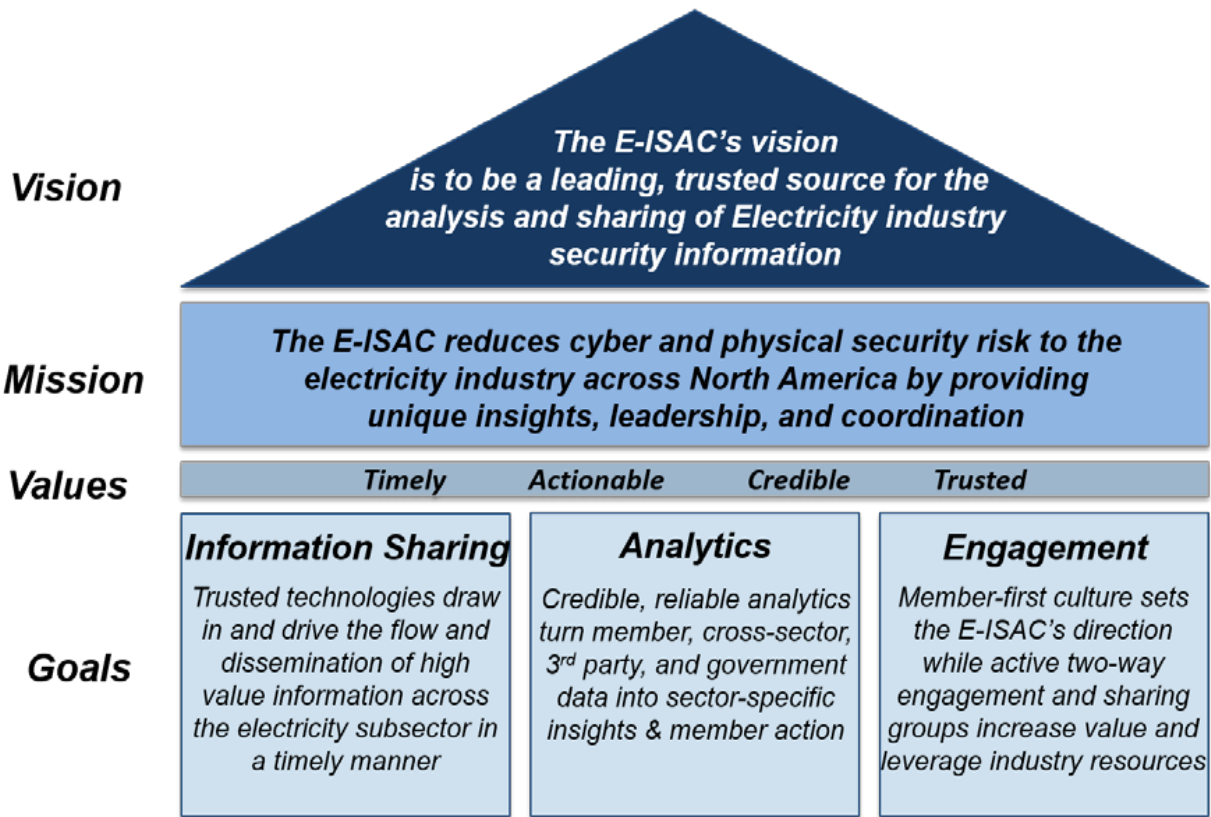
The remainder of this plan discusses improvements needed in 2017 to address current threats, a look at the mid-term range of 2018-2022 to address emerging threats, and what the E-ISAC might look like beyond 2023 if the forecasted issues continue to develop.

The Need for a Strategic Plan

Given that quite a bit of work was accomplished over the past two years to improve the E-ISAC, it is reasonable to ask why a long-term strategic plan is needed. Looking externally, there are three primary drivers:

1. Security threats continue to evolve and become more dangerous
 - a. Ukraine, IoT, and ransomware attacks are indicators
 - b. Geopolitical tensions and changing societal trends make North America a target
2. Customer expectations for highly reliable energy continue to increase
 - a. Electricity entities need to be more agile and responsive to real-time risks
 - b. Rapid technology changes also increase the risk landscape
3. More robust understanding and measurement of grid resiliency and security
 - a. Need new tools for collecting and analyzing grid security metrics data

Since the publication of the ESCC’s strategic review in 2015, the E-ISAC has solidified vision, mission, values and goals statements as shown in the graphic below. The three “goals” columns represent parts of a rising spiral of membership engagements: bringing in more information improves the analytical process, which in turn drives more engagement, which then brings in more information, which improves analytics, and so forth.

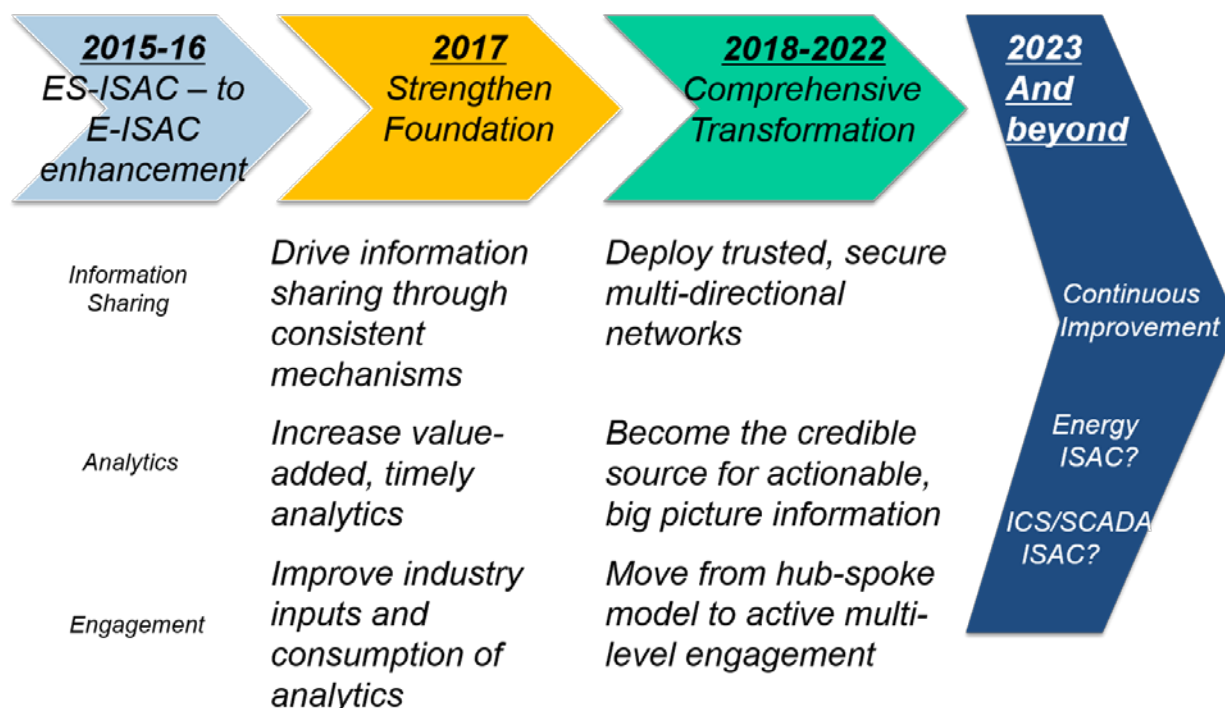


This process takes the E-ISAC to new levels as it gets better at information collection, analysis, and dissemination and represents the core capabilities of the E-ISAC. The MEC and the E-ISAC developed a related strategy for the improvement of the E-ISAC’s products and services that builds upon the pillars shown in the graphic above, and is working on a technology roadmap in partnership with NERC’s Information Technology team that also follows this method. Both of these more tactical plans support the goals and objectives of the E-ISAC’s long-term strategic plan.

Transforming the E-ISAC: 2017 and Beyond

In the coming years, NERC should build on the foundation of the 2015 ESCC recommendations, and position the E-ISAC to provide more robust security information for better understanding of security weaknesses and strengths across the ERO. By addressing the three primary drivers outlined above, NERC can transform the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry. To accomplish this, the E-ISAC must achieve a maturity level where industry completely trusts it to gather, hold, analyze, and distribute highly sensitive security information, with no fear that information voluntarily submitted to the E-ISAC would ever be used for a compliance enforcement action or investigation.

As we strengthen the foundation built over the past two years, the E-ISAC should undertake a comprehensive multi-year transformation to build capabilities that include trusted, secure, multidirectional networks and a movement from a hub/spoke model to a very active multi-level engagement. The E-ISAC strives to be the industry’s most credible source for actionable, big picture information. This roadmap is illustrated in the graphic below.



2015 and 2016 were foundation-building years, set in motion by the ESCC strategic review and the publication of the findings and recommendations. In 2015, NERC implemented an employee code of conduct, completed a physical and logical separation of the E-ISAC from other parts of NERC, hired strategic leadership and key industry experts, and rebuilt the organization with new internal functional groups. Also that year, the name was changed from the ES-ISAC to the E-ISAC and new logos, color schemes, and branding were launched. In 2016, the old web portal was upgraded with the intention of setting in motion a completely new platform capability that will launch later in 2017. Over the past two years, membership engagement and information sharing grew rapidly, new products and services were launched, and the third Grid Security Exercise (GridEx III) was successfully administered by the E-ISAC. The impact of these initial changes on the E-ISAC’s capability to respond to real-world incidents was validated by the Ukraine grid attacks in December 2015, denial of service attacks from Internet of Things (IoT) devices in October 2016, and the second Ukraine event along with the Grizzly Steppe incident at the end of December 2016.

As was pointed out frequently in the past two years, the “IS” and the “A” in “ISAC” define the two primary strategic themes that must be in place for the organization to be successful. In 2017, the E-ISAC is deploying new information sharing and analysis tools such as the Cyber Automated Information Sharing System (CAISS) and an Event Visualization Tool (EVT) to increase the speed and ease of sharing cyber threat information. While the Cybersecurity Risk Information Sharing Program (CRISP) has enhanced visibility and understanding of cyber threats for the electricity industry, processing classified information takes time. As information comes in from CRISP sensors and goes to the Pacific Northwest National Laboratory, the E-ISAC will leverage a new unclassified data storage and analytics capability inside the E-ISAC so that more actionable information can be sent to industry on a timelier basis. Later this year we anticipate that alerts and technical information will flow securely between CAISS and CRISP in our efforts to expand our data collection beyond the current participant pool and to achieve a more comprehensive picture of industry threats than we have today.

The major technical effort in 2017 is a planned replacement of the current web portal with a new “platform” that will enable automatic information sharing, the creation of private discussion groups, data visualization, and many other features that the E-ISAC’s members requested. To support the new tools and the needs of the sector,

additional analysts will be hired in 2017. In addition, new partnerships are envisioned with organizations like the Computer Emergency Response Team Coordination Center (CERT/CC), and at the end of 2017, the E-ISAC will host the GridEx IV. In mid-April 2017, the internal structure of the E-ISAC was modified to align the staff to better serve the industry. There are now two major groups—one focused on operations and analysis and the other on programs and member engagement. Some minor facility improvements are also planned for 2017.

Looking forward, the next five years (2018-2022) will focus on transforming the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry. To achieve this goal, the E-ISAC should increase its capability to collect security intelligence; increase the number of specialized analysts; acquire additional data storage, management, and sharing technologies; and increase the E-ISAC's access to classified networks and facilities.

New Intelligence Collection – To Support Better Unclassified Information Sharing

Some new collection capabilities coming online in 2017 such as CAISS and the Department of Energy's CYOTE project will bring additional intelligence, but the E-ISAC should also consider more active monitoring of public and private networks for new threats, perhaps collecting data from sensors in Operational Technology (OT) networks, and increasing the ability to monitor social media and other open sources. Some of that new collection could be done by others as a service that the E-ISAC would pay for.

Access to Classified Networks and Facilities – To Improve Sharing of Highly Sensitive Information

While the majority of the E-ISAC's staff hold US government security clearances, the facility inside of NERC operates at the unclassified level. This requires E-ISAC staff to travel to government facilities in order to view and analyze classified data. On the industry side, very few entities have access to classified facilities and most do not have staff with appropriate clearances. To support the strategic goal of better information sharing, both the E-ISAC and industry members should have increased access to classified data and classified information sharing networks. Relationships with government partners need to be leveraged to make valuable classified data and analysis rapidly available to asset owners and operators.

More Analysts – To Improve the E-ISAC's Analytical Capabilities

The E-ISAC should hire technical analysts with specializations in fields such as industrial control system security, end-point (host) security, network security, cloud security, and penetration testing. Over the next three to five years an estimated ten or more analysts should be hired at a rate of two or three per year so that the annual increase of NERC's budget is minimized.

Acquisition of New Technologies – To Improve Industry Engagement

As more data is collected, the E-ISAC should acquire additional data storage, management, and sharing technologies. These technologies must be as secure as possible, given that the risk of a targeted data breach will increase as the E-ISAC improves its capability to give early warning to industry about threats and vulnerabilities discovered via data analysis. Specific technologies needed in the next five years include event visualization via the new platform, predictive analysis based on artificial intelligence, real-time threat feeds to members, a customized platform experience for each user, and federated information sharing.

Beyond 2023 security challenges will continue to expand, requiring additional resources and perhaps a different relationship across the energy industry. Due to commonality of threats across all energy companies, rapid growth of vulnerable control systems, and a convergence of lines of business within the industry, we must consider whether or not the E-ISAC should remain focused only on electricity, or if it should expand to include all energy owners/operators (electricity, gas, oil, and natural gas).

Other items to consider beyond 2023 include the size and location of the E-ISAC facility and potential partnerships with the research community. Due to limitations of the NERC budget, some of these new capabilities would need outside funding from the government or perhaps grants from large industry companies.

Other MEC Guidance

Several questions were presented to the MEC membership about the long-term future of the E-ISAC. Most of the questions were answered in the discussion paragraphs above. The remaining questions not previously discussed and the MEC's summarized responses are below.

Should the E-ISAC move to 24/7 operations?

Not immediately but the decision should be based on changing situations and activity levels. This response is driven by the reality of the cost for the additional staff, and by the reality that very little data is submitted to the E-ISAC for analysis outside of normal business hours. But, as the E-ISAC's capabilities and data collection grow, there will likely be a point in the next 3-5 years when it might be necessary to move to round-the-clock operations.

What is the E-ISAC's relationship with other ISACs?

There is concern that other ISACs (the Financial Services ISAC, or FS-ISAC, is a recent example) will attempt to recruit electric utilities to pay for special analytical services in order to cover expanding costs. The consensus view of the MEC is that the E-ISAC should not discourage members from taking advantage of services offered by other ISACs, and should try to learn about those new capabilities with an eye towards developing them organically within the E-ISAC when appropriate. Services offered by other ISACs should be viewed as additional intelligence sources. Additionally, the E-ISAC should develop stronger information sharing partnerships with other ISACs and increase the level of cross-sector engagement.

Should the E-ISAC have an international relationship?

The E-ISAC, as part of NERC, currently has members in Canada and Mexico. The MEC recommended that the E-ISAC consider establishing formal information sharing relationships with other countries such as Japan or the United Kingdom. Because no other countries are interconnected with the North American grid beyond the US, Canada, and Mexico, any future information sharing relationship with entities in other countries would be at a very high level and must preserve the privacy of North American entities that are voluntarily sharing with the E-ISAC.

Should the E-ISAC accept funding from sources beyond NERC assessments?

Government funding may be necessary to cover costs of the recommended expansions of technical capabilities, staff, and facilities. MEC members cautioned about any potential "attached strings" that come with government grants. Beyond 2018, some member companies have expressed interest in a model like CRISP where companies can pay for additional services, or perhaps moving to a tierbased pricing model.

Conclusion and Next Steps

The next several years present an opportunity to transform the E-ISAC into a world-class intelligence collecting and analytical capability for the electricity industry; and an opportunity to support NERC's overall initiatives to better understand the current security posture of the North American grid. As threats, technologies, and business process change, the E-ISAC, in order to be as valuable as it can to the industry, must evolve to a maturity level where industry completely trusts it to gather, hold, analyze, and distribute highly sensitive security information. Specific financial projections, technology requirements, staffing, and facility improvements are being developed and will be incorporated in the NERC strategic plan and the NERC business plan and budget.

Towards this transformation, for the near term (remainder of 2017 and all of 2018), the E-ISAC plans to:

- Hire additional analysts
- Increase the in-house data storage and analysis capabilities
- Grow the CRISP and CAISS programs
- Deliver a world-class information sharing platform well before GridEx IV
- Grow membership engagement via the new platform
- Increase engagement with other ISACs and information sharing partners
- Increase engagement with Canada and Mexico
- Provide higher quality grid security metrics data to support NERC's data collection initiatives

Exhibit G – Compliance Monitoring and Enforcement Program Technology Project

With the ERO Enterprise at a critical point in its maturation, the Compliance Monitoring and Enforcement Program (CMEP) Technology Project is a strategic opportunity to significantly improve the productivity and effectiveness of the ERO Enterprise and will provide benefits to all those impacted by its work: registered entities, Regional Entities, and NERC.

Once implemented, the new solution will give NERC and the Regional Entities a greater level of visibility into identifying and managing reliability risk. The ability to catalogue and manage reliability risks across North America will combine with the ability to see those risks within the context of compliance trends, performance analysis, and forward-looking assessments. Together, these elements will provide deep and broad views of reliability across the ERO Enterprise, leading to new insights into data-informed reliability risk management. Such visibility is essential continuing maturation of the ERO Enterprise and the achievement of its reliability mission.

See the below presentation for additional information on the CMEP Technology Project.

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Compliance Monitoring and Enforcement Program - Technology Project

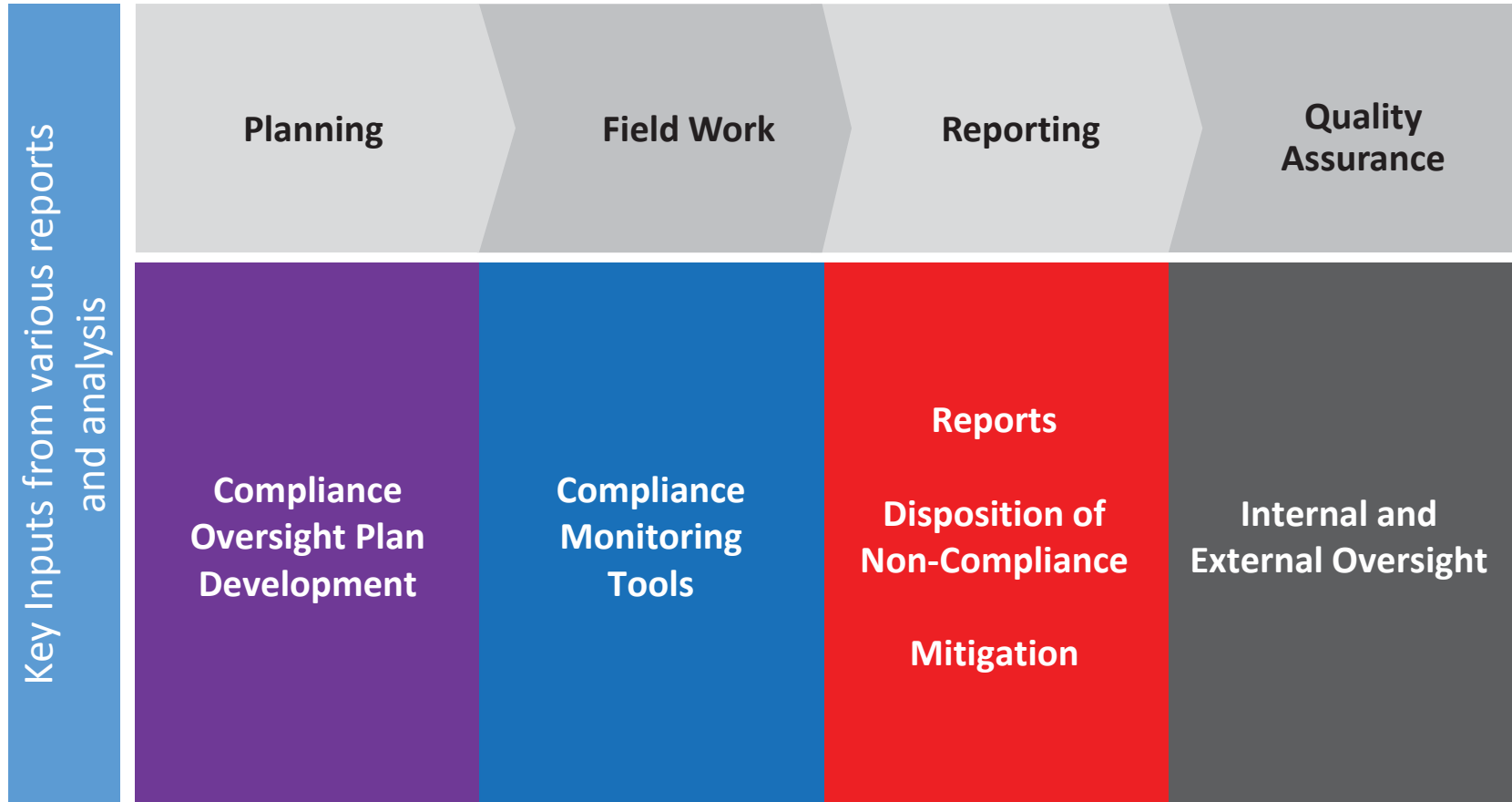
Stan Hoptroff, Vice President and Chief Technology Officer
July 14, 2017

RELIABILITY | ACCOUNTABILITY

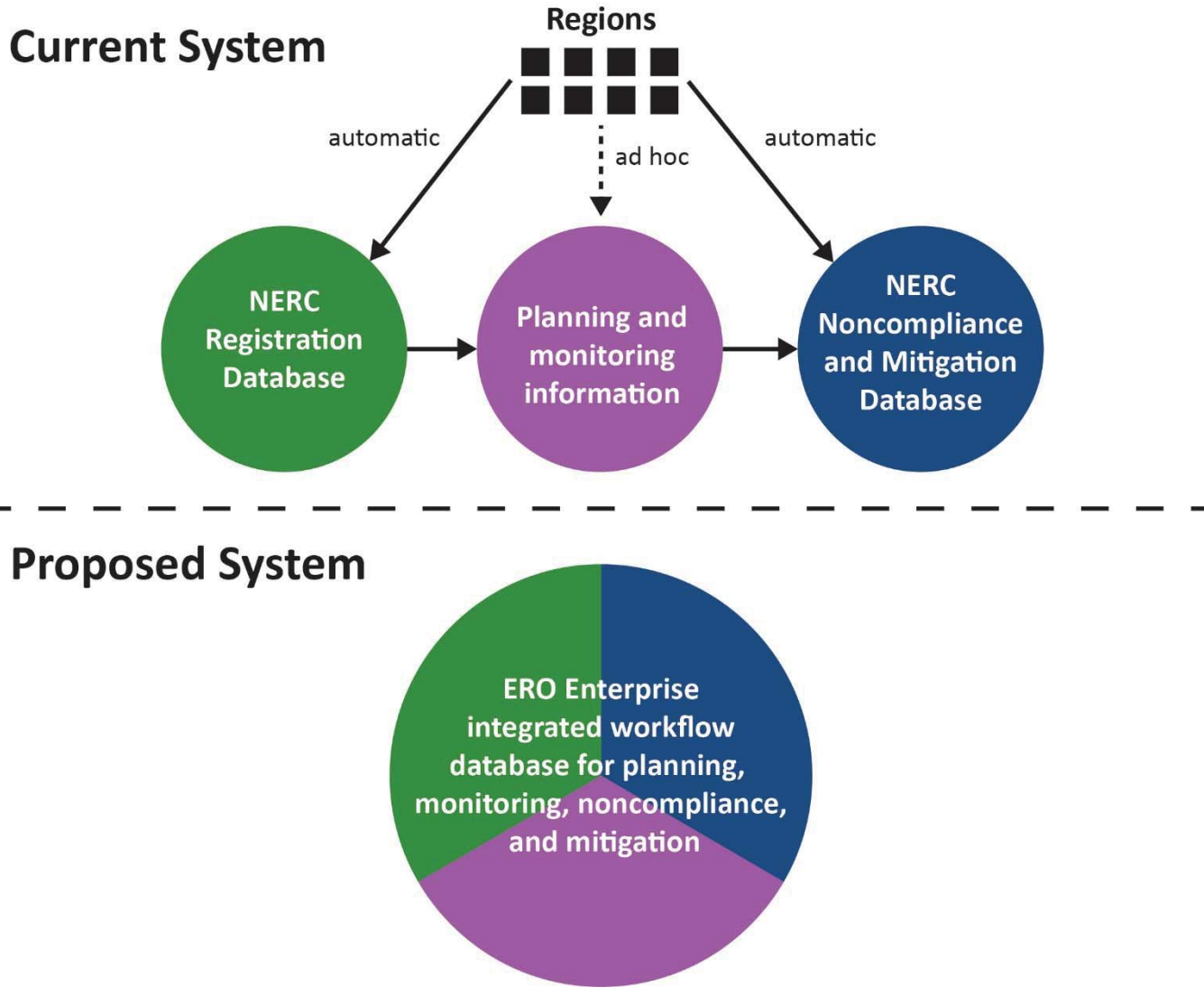


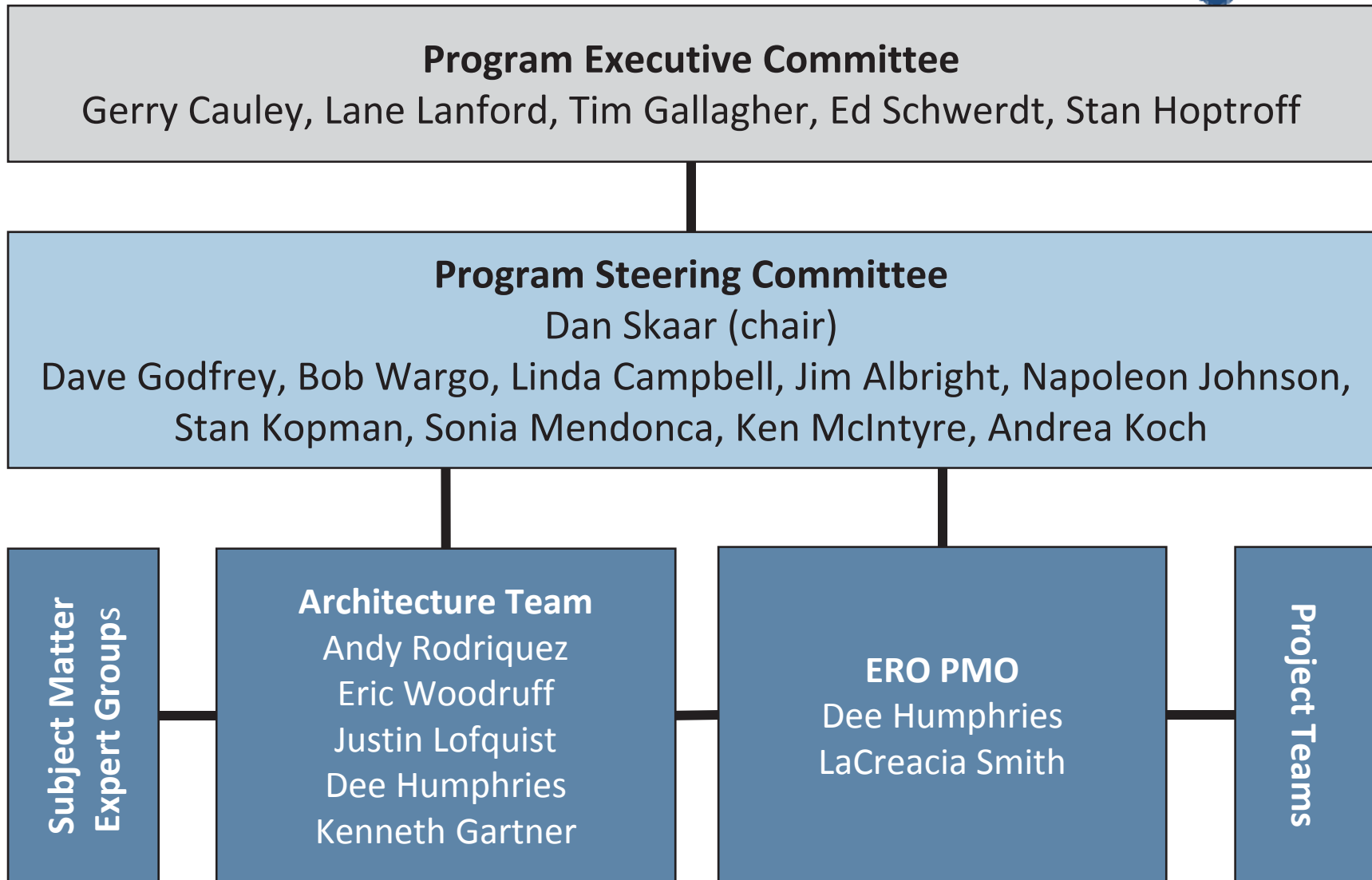
- Implement best practices and professional standards where applicable across planning, fieldwork, reporting, and quality assurance
- Share and analyze data and information for risk-informed compliance oversight across the ERO Enterprise
- Align common CMEP and Organization Registration and Certification Program (ORCP) business processes across the ERO
- Provide easier data entry, better access to information, automated workflows, and greater collaboration
- Reduce costs for CMEP-related applications by roughly 29 percent (current cost is US \$1.1M annually)

- Single, common interface for registered entities
- Improved consistency with common CMEP and ORCP processes
- Increased capability supporting risk-based approach to CMEP
- Increased productivity through automated, standardized workflows
- Improved analytics through shared data and information
- Enhanced quality assurance and oversight
- Reduced application costs across the ERO Enterprise



Single system contains all CMEP-related work documentation to support determinations





2017	2018	2019	2020
Discovery and RFP			
	Design and Prototype	Implementation	

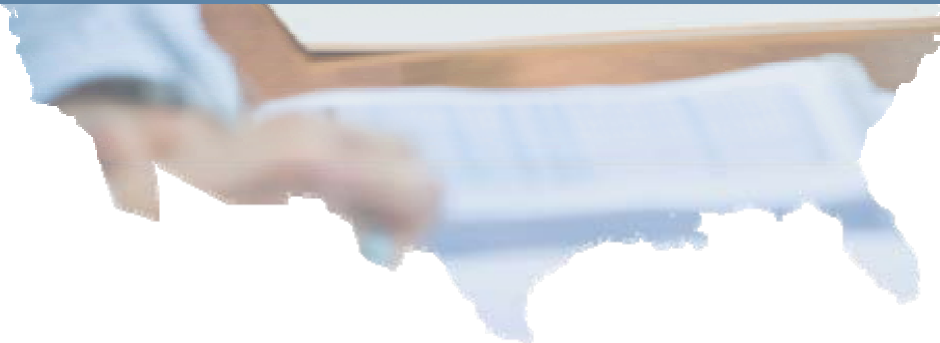
	2017	2018	2019	2020
Estimated Total Capital Investment by Year	\$280,000	\$1,548,000	\$1,768,000	\$1,507,000
Estimated Total Capital Investment	\$5,103,000			

Estimated Annual Operating Costs: \$780,000

Current Annual Operating Costs for only Enforcement Processing tools: \$1,100,000



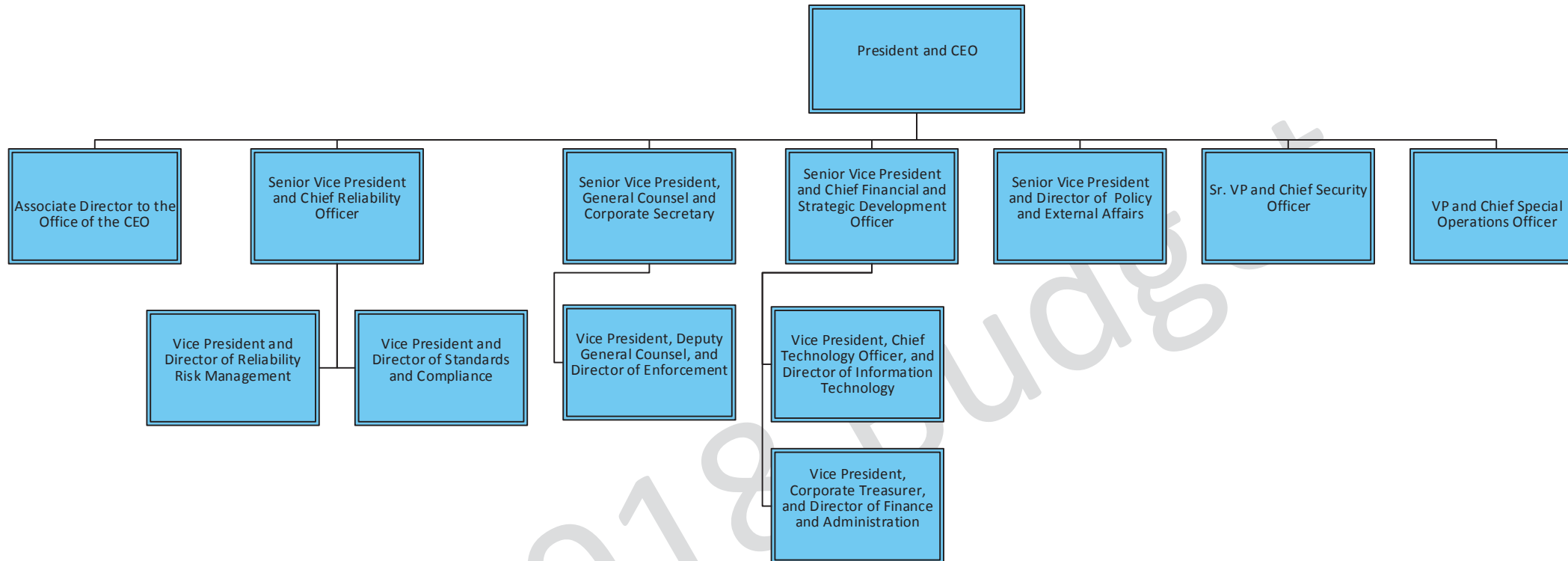
Questions and Answers



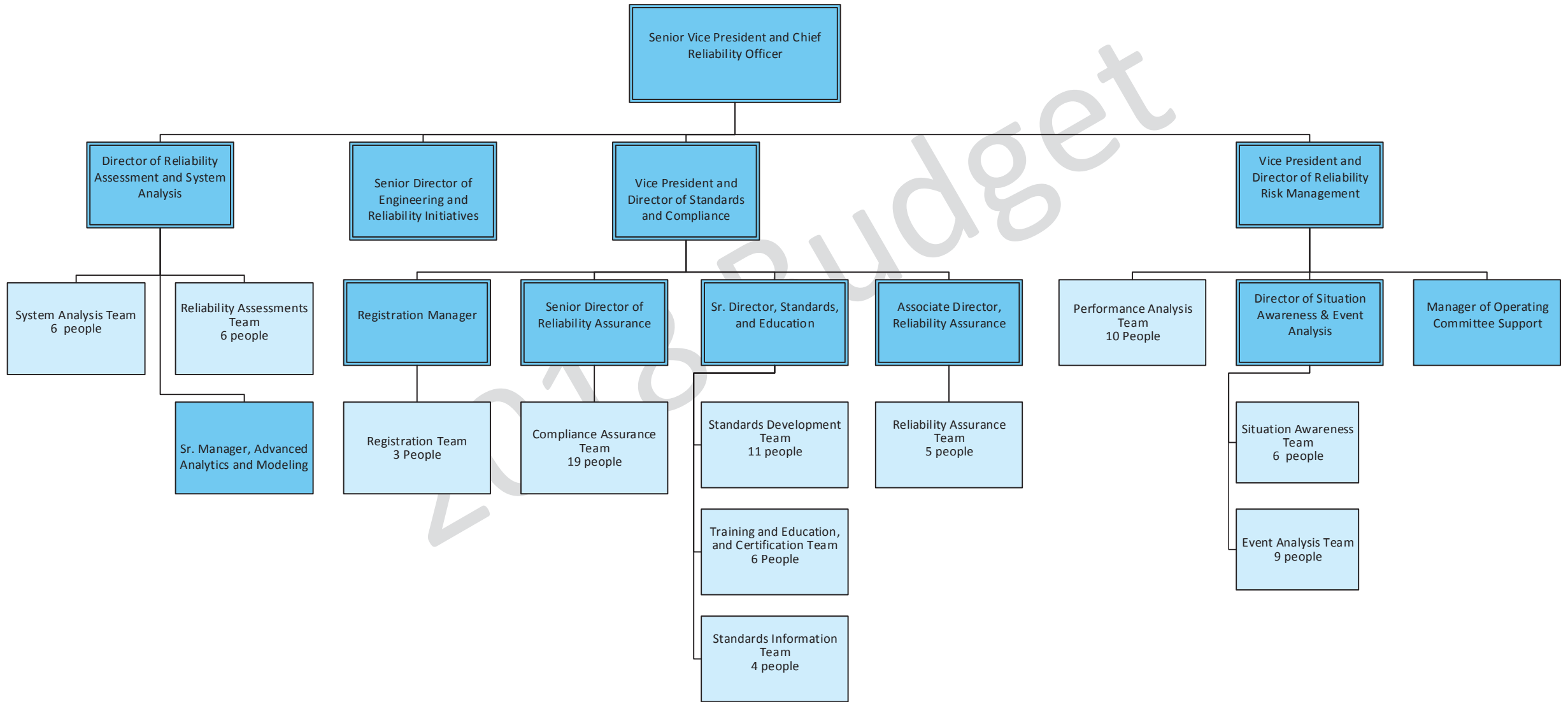
Appendix 1 – NERC Staff Organization Chart

See subsequent pages for NERC's Organization Chart.

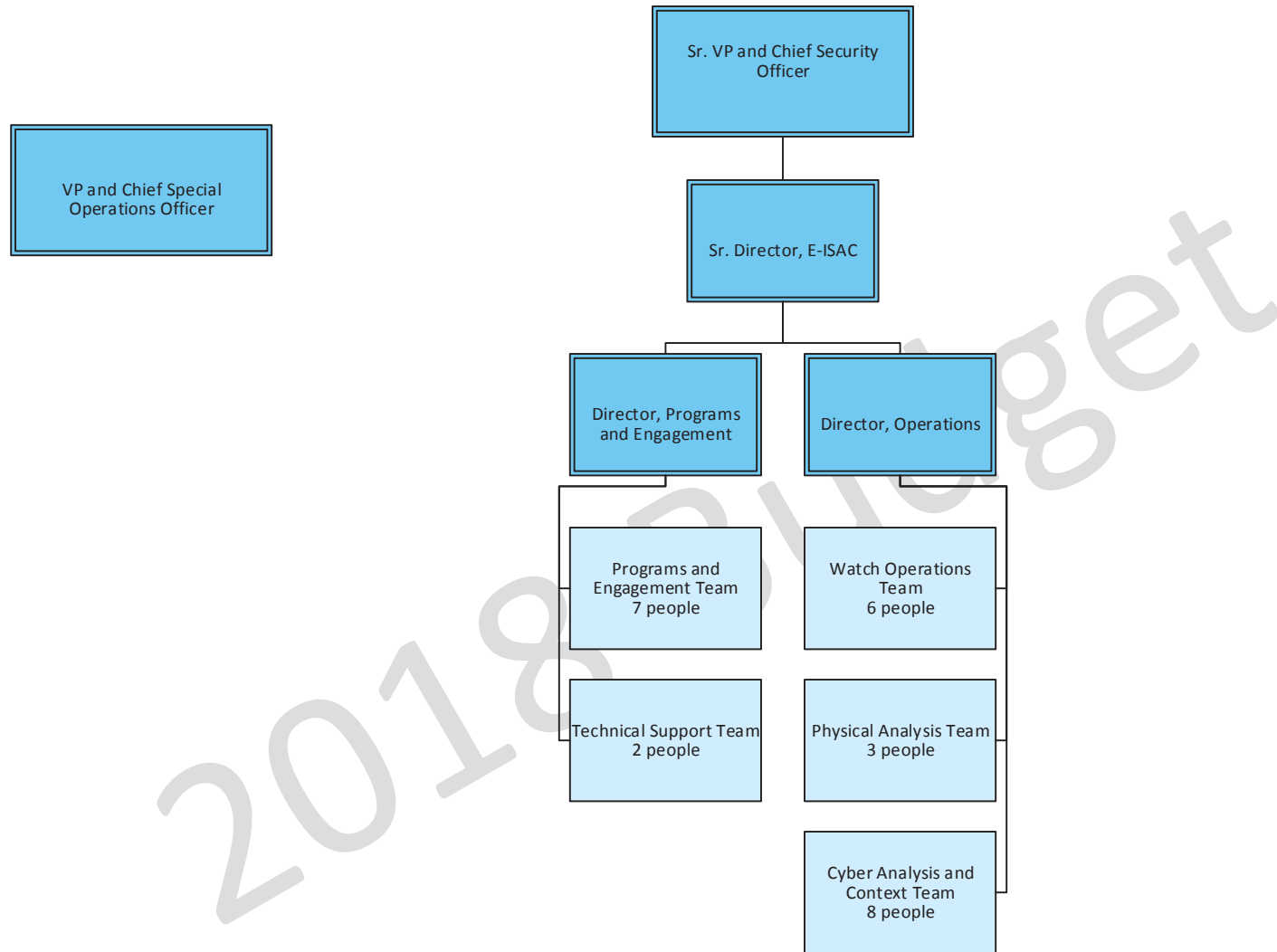
NERC Staff Organization Chart – Budget 2018



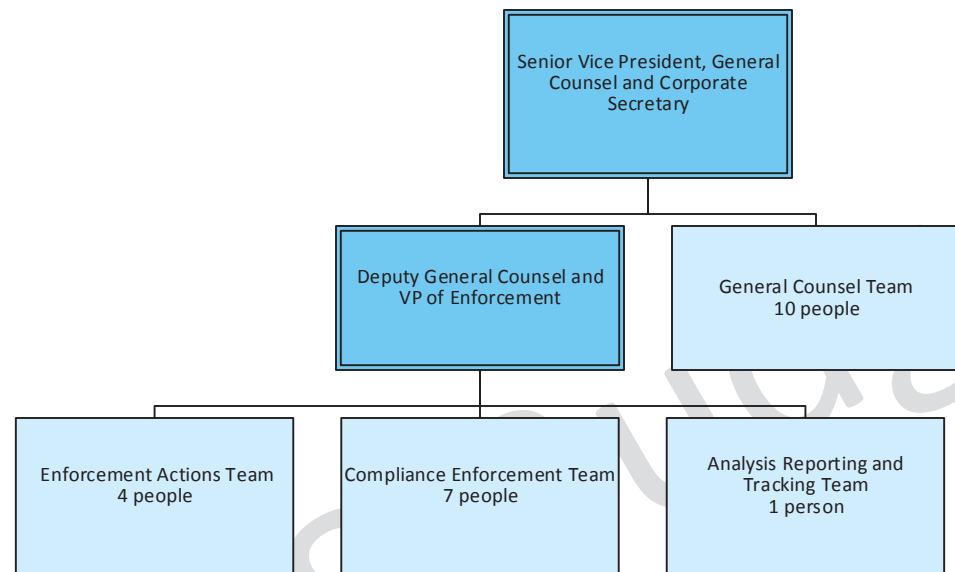
Reliability Standards, Reliability Assurance, Reliability Assessment and System Oversight, Performance Analysis, Event Analysis, Situation Awareness, Training and Education



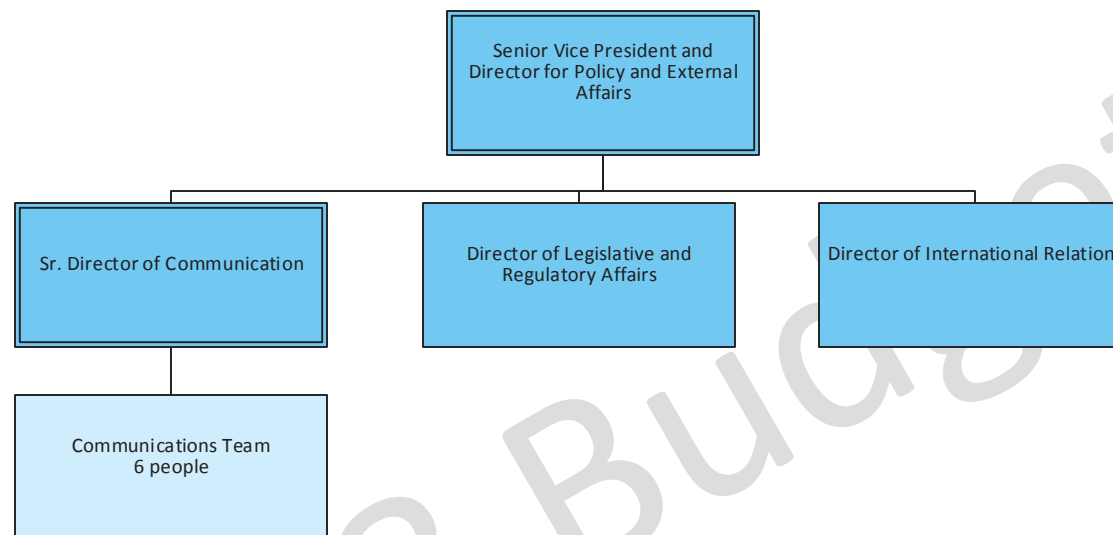
Electricity Information Sharing and Analysis Center



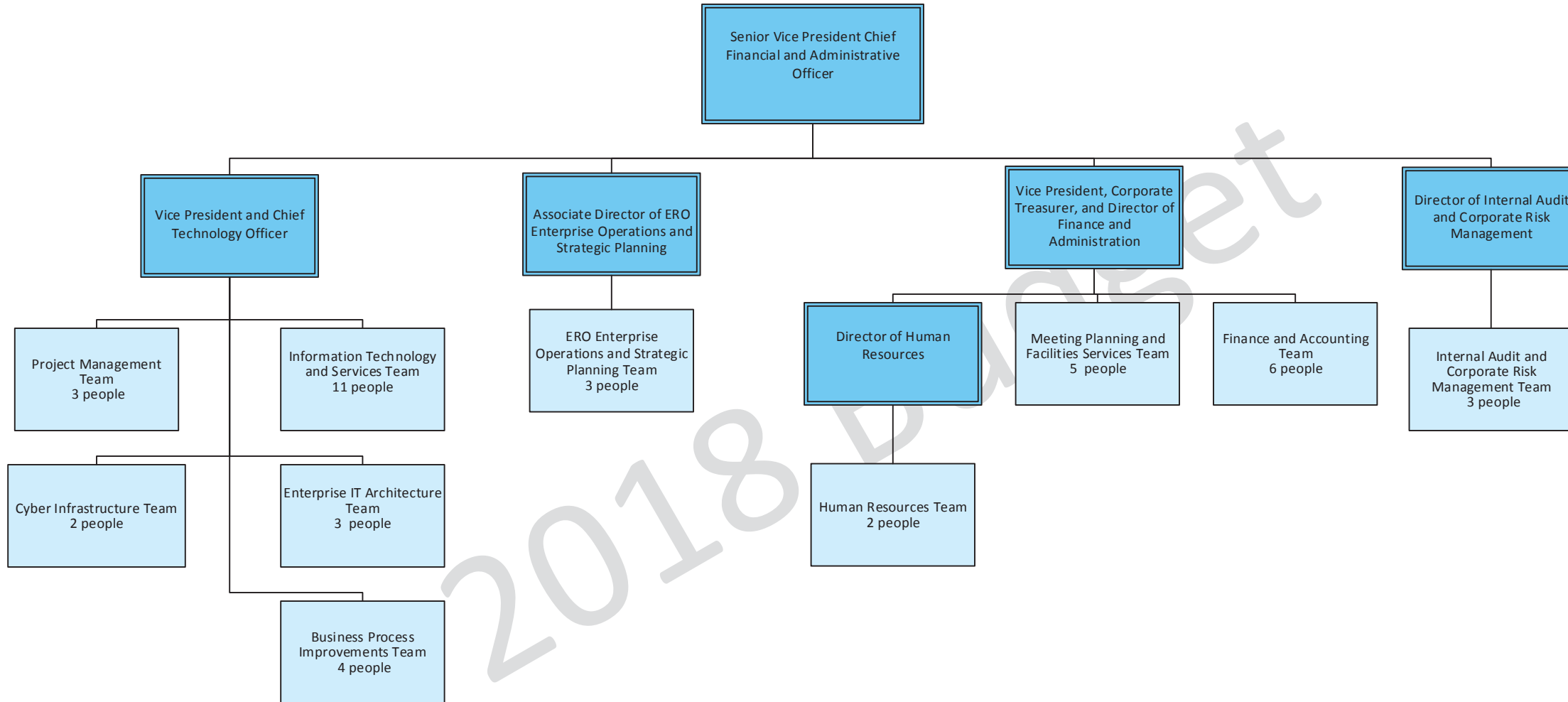
Legal and Regulatory Compliance Enforcement



Policy and External Affairs



Information Technology, Human Resources, and Accounting & Finance



Data Year	Regional Entity	ID	Entity	Country	Total NEL (MWh)	U.S. NEL	Canada NEL	Mexico NEL	% of RE total	US Total	Canada Total	Mexico Total	% WECC, Excl PSC of CO	% of ERO Total	US Total	Canada Total	Mexico Total	% of ERO - US Only
2016	WECC		Western Area Power Administration-Upper Great Plains Region	U.S.	354,503	354,503			0.041%	0.041%	0.000%	0.000%	0.043%	0.008%	0.008%	0.000%	0.000%	0.009%
2016	WECC		Aha Macav Power Service	U.S.	11,843	11,843			0.001%	0.001%	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%
2016	WECC		Bureau of Reclamation (Wellfield)	U.S.	9,146	9,146			0.001%	0.001%	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%
2016	WECC		Central Arizona Water Conservation District	U.S.	2,382,677	2,382,677			0.278%	0.278%	0.000%	0.000%	0.288%	0.053%	0.053%	0.000%	0.000%	0.060%
2016	WECC		City of Boulder City	U.S.	77,330	77,330			0.009%	0.009%	0.000%	0.000%	0.009%	0.002%	0.002%	0.000%	0.000%	0.002%
2016	WECC		City of Mesa	U.S.	264,773	264,773			0.031%	0.031%	0.000%	0.000%	0.032%	0.006%	0.006%	0.000%	0.000%	0.007%
2016	WECC		Needles Public Utilities Authority	U.S.	29,710	29,710			0.003%	0.003%	0.000%	0.000%	0.004%	0.001%	0.001%	0.000%	0.000%	0.001%
2016	WECC		Colorado River Agency-Bureau of Indian Affairs	U.S.	17,546	17,546			0.002%	0.002%	0.000%	0.000%	0.002%	0.000%	0.000%	0.000%	0.000%	0.000%
2016	WECC		Electrical District #2	U.S.	203,800	203,800			0.024%	0.024%	0.000%	0.000%	0.025%	0.005%	0.005%	0.000%	0.000%	0.005%
2016	WECC		Electrical District #2 - Coolidge Generating Station	U.S.	9,527	9,527			0.001%	0.001%	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%
2016	WECC		Silver State Energy Association	U.S.	567,322	567,322			0.066%	0.066%	0.000%	0.000%	0.069%	0.013%	0.013%	0.000%	0.000%	0.014%
2016	WECC		Arizona Electric Power Cooperative, Inc	U.S.	2,872,358	2,872,358			0.335%	0.335%	0.000%	0.000%	0.347%	0.064%	0.064%	0.000%	0.000%	0.072%
2016	WECC		U.S. Army Yuma Proving Ground	U.S.	20,047	20,047			0.002%	0.002%	0.000%	0.000%	0.002%	0.000%	0.000%	0.000%	0.000%	0.001%
2016	WECC		Wellton-Mohawk Irrigation & Drainage District	U.S.	4,520	4,520			0.001%	0.001%	0.000%	0.000%	0.001%	0.000%	0.000%	0.000%	0.000%	0.000%
2016	WECC		Western Area Power Administration-Desert Southwest Region	U.S.	1,574,927	1,574,927			0.184%	0.184%	0.000%	0.000%	0.190%	0.035%	0.035%	0.000%	0.000%	0.040%
TOTAL WECC					857,250,282	722,744,087	121,411,129	13,095,066	100.000%	84.310%	14.163%	1.528%	100.000%	19.021%	16.036%	2.694%	0.291%	18.154%
TOTAL ERO					4,506,897,694	3,981,131,801	512,670,827	13,095,066	800.000%	713.206%	85.266%	1.528%	100.000%	100.000%	88.334%	11.375%	0.291%	100.000%
Summary by Regional Entity					Total NEL (MWh)	U.S. NEL	Canada NEL	Mexico NEL										
2016	FRCC				234,139,882	234,139,882	-	-	100.000%	100.000%	0.000%	0.000%	0.000%	5.195%	5.195%	0.000%	0.000%	5.881%
2016	MRO				289,292,028	241,683,330	47,608,698	-	100.000%	83.543%	16.457%	0.000%	0.000%	6.419%	5.363%	1.056%	0.000%	6.071%
2016	NPCC				628,864,000	285,213,000	343,651,000	-	100.000%	45.354%	54.646%	0.000%	0.000%	13.953%	6.328%	7.625%	0.000%	7.164%
2016	RF				894,286,883	894,286,883	-	-	100.000%	100.000%	0.000%	0.000%	0.000%	19.843%	19.843%	0.000%	0.000%	22.463%
2016	SERC				1,022,554,364	1,022,554,364	-	-	100.000%	100.000%	0.000%	0.000%	0.000%	22.689%	22.689%	0.000%	0.000%	25.685%
2016	SPP				227,488,700	227,488,700	-	-	100.000%	100.000%	0.000%	0.000%	0.000%	5.048%	5.048%	0.000%	0.000%	5.714%
2016	TRE				353,021,556	353,021,556	-	-	100.000%	100.000%	0.000%	0.000%	0.000%	7.833%	7.833%	0.000%	0.000%	8.867%
2016	WECC				857,250,282	722,744,087	121,411,129	13,095,066	100.000%	84.310%	14.163%	1.528%	100.000%	19.021%	16.036%	2.694%	0.291%	18.154%
Total					4,506,897,694	3,981,131,801	512,670,827	13,095,066	800.000%	713.206%	85.266%	1.528%	100.000%	100.000%	88.334%	11.375%	0.291%	100.000%

2016 NEL Calculations and Allocations to Load Serving Entities (or Designee) for the 2018 NERC and RE Assessments

Data Year	Regional Entity	ID	Entity	Country	Total ERO Assessments (NERC, RE & WIRAB Costs)				Total NERC Assessments				Total Regional Entity Assessments (Including WIRAB Assessments)				
					Total	US	Canada	Mexico	Total	US	Canada	Mexico	Total	US	Canada	Mexico	
Summary by Regional Entity																	
2016	FRCC				10,013,797	10,013,797	-	-	3,353,279	3,353,279	-	-	6,660,518	6,660,518	-	-	
2016	MRO				14,880,432	12,402,201	2,478,231	-	4,150,326	3,461,314	689,012	-	10,730,106	8,940,887	1,789,219	-	
2016	NPCC				22,036,478	12,834,193	9,202,285	-	7,694,691	4,084,733	3,609,958	-	14,341,787	8,749,460	5,592,327	-	
2016	RF				32,955,408	32,955,408	-	-	12,807,701	12,807,701	-	-	20,147,707	20,147,707	-	-	
2016	SERC				31,849,844	31,849,844	-	-	14,644,708	14,644,708	-	-	17,205,136	17,205,136	-	-	
2016	SPP				12,985,288	12,985,288	-	-	3,258,023	3,258,023	-	-	9,727,265	9,727,265	-	-	
2016	TRE				16,327,852	16,327,852	-	-	5,055,866	5,055,866	-	-	11,271,986	11,271,986	-	-	
2016	WECC				37,965,400	32,743,547	4,585,652	636,201	11,972,373	10,302,881	1,479,975	189,517	25,993,026	22,440,666	3,105,677	446,684	
Total					179,014,499	162,112,130	16,266,168	636,201	62,936,968	56,968,506	5,778,945	189,517	116,077,531	105,143,625	10,487,223	446,684	

2016 NEL Calculations and Allocations to Load Serving Entities (or Designee) for the 2018 NERC and RE Assessments

Data Year	Regional Entity	ID	Entity	Country	Total NERC Assessments				NERC NEL Assessments				Penalty Sanctions		NERC Compliance Credits				Prior Year Corrections-WECC			
					Total	US	Canada	Mexico	Total	US	Canada	Mexico	Total	US	Total	US	Canada	Mexico	Total	US	Canada	Mexico
2016	WECC		Colorado River Agency-Bureau of Indian Affairs	U.S.	251	251	-	-	247	247	-	-	(3)	(3)	6	6	-	-	0	0	-	-
2016	WECC		Electrical District #2	U.S.	2,919	2,919	-	-	2,873	2,873	-	-	(31)	(31)	74	74	-	-	2	2	-	-
2016	WECC		Electrical District #2 - Coolidge Generating Station	U.S.	136	136	-	-	134	134	-	-	(1)	(1)	3	3	-	-	0	0	-	-
2016	WECC		Silver State Energy Association	U.S.	8,125	8,125	-	-	7,998	7,998	-	-	(86)	(86)	207	207	-	-	6	6	-	-
2016	WECC		Arizona Electric Power Cooperative, Inc	U.S.	41,137	41,137	-	-	40,494	40,494	-	-	(433)	(433)	1,046	1,046	-	-	31	31	-	-
2016	WECC		U.S. Army Yuma Proving Ground	U.S.	287	287	-	-	283	283	-	-	(3)	(3)	7	7	-	-	0	0	-	-
2016	WECC		Wellton-Mohawk Irrigation & Drainage District	U.S.	65	65	-	-	64	64	-	-	(1)	(1)	2	2	-	-	0	0	-	-
2016	WECC		Western Area Power Administration-Desert Southwest Region	U.S.	22,556	22,556	-	-	22,203	22,203	-	-	(237)	(237)	573	573	-	-	17	17	-	-
TOTAL WECC					11,972,373	10,302,881	1,479,975	189,517	12,085,272	10,189,042	1,711,620	184,611	(108,925)	(108,925)	34,927	263,098	(232,939)	4,767	(38,900)	(40,333)	1,294	140
TOTAL ERO					62,936,968	56,968,506	5,778,945	189,517	63,536,968	56,124,869	7,227,488	184,611	(600,000)	(600,000)	(0)	1,449,240	(1,454,007)	4,767	-	(5,604)	5,464	140
Summary by Regional Entity																						
2016	FRCC				3,353,279	3,353,279	-	-	3,300,838	3,300,838	-	-	(35,287)	(35,287)	85,233	85,233	-	-	2,496	2,496	-	-
2016	MRO				4,150,326	3,461,314	689,012	-	4,078,357	3,407,183	671,174	-	(36,424)	(36,424)	105,310	87,979	17,331	-	3,083	2,576	507	-
2016	NPCC				7,694,691	4,084,733	3,609,958	-	8,865,547	4,020,852	4,844,695	-	(42,985)	(42,985)	(1,134,574)	103,825	(1,238,399)	-	6,703	3,040	3,663	-
2016	RF				12,807,701	12,807,701	-	-	12,607,403	12,607,403	-	-	(134,779)	(134,779)	325,545	325,545	-	-	9,532	9,532	-	-
2016	SERC				14,644,708	14,644,708	-	-	14,415,682	14,415,682	-	-	(154,110)	(154,110)	372,238	372,238	-	-	10,899	10,899	-	-
2016	SPP				3,258,023	3,258,023	-	-	3,207,071	3,207,071	-	-	(34,285)	(34,285)	82,812	82,812	-	-	2,425	2,425	-	-
2016	TRE				5,055,866	5,055,866	-	-	4,976,798	4,976,798	-	-	(53,204)	(53,204)	128,509	128,509	-	-	3,763	3,763	-	-
2016	WECC				11,972,373	10,302,881	1,479,975	189,517	12,085,272	10,189,042	1,711,620	184,611	(108,925)	(108,925)	34,927	263,098	(232,939)	4,767	(38,900)	(40,333)	1,294	140
Total					62,936,968	56,968,506	5,778,945	189,517	63,536,968	56,124,869	7,227,488	184,611	(600,000)	(600,000)	(0)	1,449,240	(1,454,007)	4,767	-	(5,604)	5,464	140

Data Year	Regional Entity	ID	Entity	Country	Total Regional Entity Assessments (Including WIRAB Assessments)				Regional Entity NEL Assessments				Penalty Sanctions - US Only		NPCC CORC Program			Correct WECC 2017 Assessments - PSC of CO				WECC Compliance Assessments (ex-AESO)				WIRAB Assessments				Correct WIRAB 2017 Assessments - PSC of CO			
					Total	US	Canada	Mexico	Total	US	Canada	Mexico	Total	US	Total	US	Canada	Total	US	Canada	Mexico	Total	US	Canada	Mexico	Total	US	Canada	Mexico	Total	US	Canada	Mexico
2016	WECC		Arizona Electric Power Cooperative, Inc	U.S.	89,633	89,633	-	-	91,748	91,748	-	-	(8,346)	(8,346)	-	-	-	365	365	-	-	3,470	3,470	-	-	2,382	2,382	-	-	13	13	-	-
2016	WECC		U.S. Army Yuma Proving Ground	U.S.	626	626	-	-	640	640	-	-	(58)	(58)	-	-	-	3	3	-	-	24	24	-	-	17	17	-	-	0	0		
2016	WECC		Wellton-Mohawk Irrigation & Drainage District	U.S.	141	141	-	-	144	144	-	-	(13)	(13)	-	-	-	1	1	-	-	5	5	-	-	4	4	-	-	0	0		
2016	WECC		Western Area Power Administration-Desert Southwest Region	U.S.	49,146	49,146	-	-	50,306	50,306	-	-	(4,576)	(4,576)	-	-	-	200	200	-	-	1,903	1,903	-	-	1,306	1,306	-	-	7	7		
TOTAL WECC					25,993,026	22,440,666	3,105,677	446,684	27,382,000	23,085,648	3,878,073	418,278	(2,100,000)	(2,100,000)	-	-	-	0	(17,098)	15,434	1,665	(0)	873,242	(889,064)	15,822	711,026	599,463	100,702	10,861	(0)	(590)	532	57
TOTAL ERO					116,077,531	105,143,625	10,487,223	446,684	113,408,357	103,670,970	9,319,108	418,278	(5,776,000)	(5,776,000)	7,734,148	5,793,637	1,940,511	0	(17,098)	15,434	1,665	(0)	873,242	(889,064)	15,822	711,026	599,463	100,702	10,861	(0)	(590)	532	57
Summary by Regional Entity					(0)																												
2016	FRCC				6,660,518	6,660,518	-	-	6,913,663	6,913,663	-	-	(253,145)	(253,145)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	MRO				10,730,106	8,940,887	1,789,219	-	10,872,106	9,082,887	1,789,219	-	(142,000)	(142,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	NPCC				14,341,787	8,749,460	5,592,327	-	6,682,639	3,030,823	3,651,816	-	(75,000)	(75,000)	7,734,148	5,793,637	1,940,511	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	HF				20,147,707	20,147,707	-	-	22,060,584	22,060,584	-	-	(1,912,877)	(1,912,877)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	SERC				17,205,136	17,205,136	-	-	17,933,114	17,933,114	-	-	(727,978)	(727,978)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	SPP				9,727,265	9,727,265	-	-	10,017,265	10,017,265	-	-	(290,000)	(290,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	TRE				11,271,986	11,271,986	-	-	11,546,986	11,546,986	-	-	(275,000)	(275,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2016	WECC				25,993,026	22,440,666	3,105,677	446,684	27,382,000	23,085,648	3,878,073	418,278	(2,100,000)	(2,100,000)	-	-	-	0	(17,098)	15,434	1,665	(0)	873,242	(889,064)	15,822	711,026	599,463	100,702	10,861	(0)	(590)	532	57
Total					116,077,531	105,143,625	10,487,223	446,684	113,408,357	103,670,970	9,319,108	418,278	(5,776,000)	(5,776,000)	7,734,148	5,793,637	1,940,511	0	(17,098)	15,434	1,665	(0)	873,242	(889,064)	15,822	711,026	599,463	100,702	10,861	(0)	(590)	532	57

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 3

NORTHEAST POWER COORDINATING COUNCIL, INC.

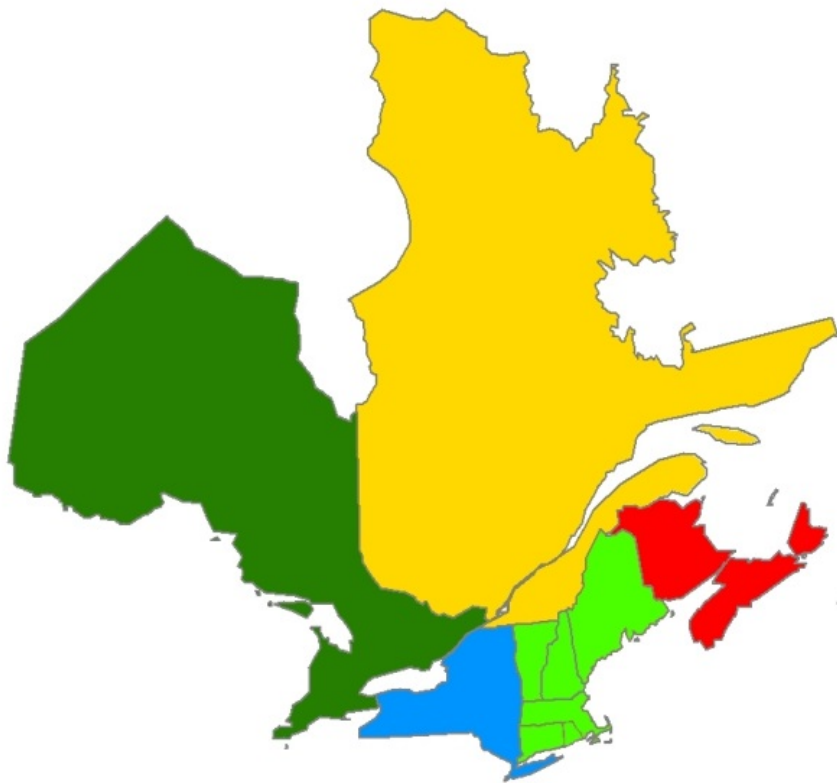
PROPOSED 2018 BUSINESS PLAN AND BUDGET



NORTHEAST POWER COORDINATING COUNCIL, INC.
1040 AVE. OF THE AMERICAS, NEW YORK, NY 10018 (212) 840-1070 FAX (212) 302-2782

Northeast Power Coordinating Council, Inc. (NPCC)

2018 Business Plan and Budget



**Approved by the
NPCC Board of Directors
at its June 28, 2017 Meeting and
Resubmitted to NERC June 28, 2017**

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Introduction

Total NPCC Resources				
(in whole dollars)				
	2018 Budget	U.S.	Canada	Mexico
Regional Entity Division FTEs	36.86			
Criteria Services Division FTEs	2.14			
Total FTEs	39.00			
Regional Entity Division Expenses	\$15,260,967			
Criteria Services Division Expenses	\$1,082,983			
Total Expenses	\$16,343,950			
Regional Entity Division Inc(Dec) in Fixed Assets	(\$154,000)			
Criteria Services Division Inc(Dec) in Fixed Assets	(\$16,000)			
Total Inc(Dec) in Fixed Assets	(\$170,000)			
Regional Entity Division Working Capital Requirement**	(\$626,180)			
Criteria Services Division Working Capital Requirement***	(\$47,843)			
Total Working Capital Requirement	(\$674,023)			
Total Regional Entity Division Funding Requirement	\$14,480,787			
Total Criteria Services Division Funding Requirement	\$1,019,141			
Total Funding Requirement	\$15,499,927			
Regional Entity Division Assessments	\$14,341,787	\$8,749,460	\$5,592,327	
Regional Entity Division Assessments Percentage	100%	61%	39%	
Criteria Services Division Membership Fees	\$1,019,141	\$462,218	\$556,923	
Total NPCC Assessments & Membership Fees	\$15,360,927	\$9,211,678	\$6,149,249	
NEL	628,864,000	285,213,000	343,651,000	
NEL %	100%	45%	55%	

** Refer to Table B-1 on page 64 in Section B.

*** Refer to the Reserve Analysis on page 82 in Section C.

2018 Overview of Total NPCC Resource Requirements

Due to the international nature of NPCC, the total resource requirements including both Regional Entity division and Criteria Services division are identified above. The individual divisional explanations are contained in subsequent sections.

NPCC proposes no change to its total budget and assessments. On a division level, NPCC proposes a Regional Entity total budget decrease of 0.3% and a Criteria Services division total budget increase of 3.8%. The proposed 2018 funding requirements will be satisfied by a Regional Entity division assessment of \$14,341,787 and Criteria Services division fees of \$1,019,141, for a total of \$15,360,927. The total NPCC assessments and fees of \$15,360,927 represents no change from 2017. NPCC believes that the Region remains an effective provider of Regional Entity and Criteria Services division functions. NPCC's corporate culture centers on consistent delivery of excellent results at a cost that is considerate of the longstanding tradition in the Northeast of affordable and reliable electricity.

Organizational Overview

Northeast Power Coordinating Council, Inc. (NPCC) is a 501(c)(6) not-for-profit corporation in the state of New York responsible for promoting and improving the reliability of the international, interconnected bulk power systems in Northeastern North America through (i) the development of Regional Reliability Standards and compliance assessment and enforcement of continent-wide and Regional Reliability Standards, coordination of system planning, design and operations, and assessment of reliability (collectively, Regional Entity activities), and (ii) the establishment of Regionally-specific criteria, and monitoring and enforcement of compliance

with such criteria (collectively, Criteria Services activities). NPCC provides the functions and services for Northeastern North America of a cross-border Regional Entity through a Regional Entity division, as well as Regionally-specific Criteria Services for Northeastern North America through a Criteria Services division. NPCC's website is www.npcc.org.

The NPCC Region covers nearly 1.2 million square miles and is populated by more than 56 million people. NPCC U.S. includes the six New England states and the state of New York. NPCC Canada includes the provinces of Ontario, Québec and the Maritime provinces of New Brunswick and Nova Scotia. In total, from a net energy for load perspective, NPCC is approximately 45% U.S. and 55% Canadian. With regard to Canada, approximately 70% of Canadian net energy for load is within the NPCC Region.

Effective January 1, 2016, NPCC executed an Amended and Restated Regional Delegation Agreement with the North American Electric Reliability Corporation (NERC) that delegates to NPCC certain responsibilities and authorities of a cross-border Regional Entity as defined by *Section 215* of the Federal Power Act in the U.S. In addition, NPCC has executed Memoranda of Understanding or Agreements with Canadian provincial regulatory and/or governmental authorities in Ontario, Québec, New Brunswick and Nova Scotia.

It is imperative that NPCC maintain its ability to carry out delegated authorities and responsibilities. NPCC has a flat 2018 targeted staffing level of 39 power industry professionals and support personnel. Details of the 2018 business plans and budget for each program area are included in Section A for the Regional Entity division. The 2018 Regional Entity division schedules are shown in Section B. Section C details the 2018 Criteria Services division business plan and budget.

Membership and Governance

NPCC monitors approximately 205 registered entities and some 427 functions in the Region for compliance with mandatory Reliability Standards. NPCC currently has approximately 80 members. There are two categories of membership, General and Full. The two categories distinguish between Regional Entity delegated services that are provided in support of the U.S. FERC and Canadian provincial MOUs or Agreements with regulatory and/or governmental authorities, and Criteria Services which FERC references as U.S. non-delegated activities.

General Membership is voluntary and is open to any person or entity, including any entity participating in the Registered Ballot Body of the Electric Reliability Organization (ERO) that has an interest in the reliable operation of the Northeastern North American bulk power system. General Members which are also registered entities within the NPCC Region are subject to compliance with Reliability Standards, consistent with their registration, and also receive additional services from the Regional Entity division of NPCC.

Full Membership is available to Members which are already General Members and participate in electricity markets in the Northeast. Independent system operators (ISOs), Regional transmission organizations (RTOs), Transcos and other organizations or entities that perform the Balancing Authority function operating in Northeastern North America are expected to be Full Members of NPCC. The New York State Reliability Council and any other sub-regional reliability councils which may be formed are also expected to be Full Members. Full Members are subject to compliance with Regionally-specific more stringent reliability criteria for their generation and transmission facilities on which faults or disturbances can have a significant adverse impact outside of the local area and which are identified utilizing a reliability impact-

based methodology, in addition to Reliability Standards, and receive additional services from the Criteria Services division of NPCC, which is not funded through the ERO.

Under the Criteria Services division, NPCC will seek out and evaluate for membership, entities involved in emerging technologies to assure that those entities that have an impact on Bulk Electric System reliability are included in appropriate NPCC activities.

Since January 1, 2012 NPCC is governed by a Board of Directors consisting of seven stakeholder voting sectors consisting of a maximum of two directors per sector, an independent sector consisting of two independent directors, an independent Board Chair with voting rights to preclude board deadlocks, and the President and CEO. Within NPCC, no two sectors can control and no one sector can block action. The voting sectors on the NPCC Board of Directors include:

Sector 1) Transmission Owners

Sector 2) Reliability Coordinators

Sector 3) Transmission Dependent Utilities, Distribution Companies, Load Serving Entities

Sector 4) Generator Owners

Sector 5) Marketers, Brokers and Aggregators

Sector 6) Regulators

Sector 7) Sub-Regional Reliability Councils, Customers, other Regional Entities and Interested Entities

Sector 8) Independent

A Finance and Audit Committee (FAC), a Pension Committee (PC), a Corporate Governance and Nominating Committee (CGNC), and a Management Development and Compensation Committee (MDCC) advise the Board on finance, governance, compensation and human resource matters consistent with their approved charters. The Board endorses a non-employee, Certified Public Accountant for election by the NPCC Members as Treasurer of the corporation. The Treasurer chairs the FAC and works with the Chief Operating Officer who provides oversight of the finances of the corporation. The Treasurer reports to the Board on the corporation's financial position, on FAC activities, on tax code requirements, and on independent annual audit results and accounting practices.

The Regional Standards Committee (RSC), the Compliance Committee (CC), the Reliability Coordinating Committee (RCC), and the Public Information Committee, consistent with their approved scopes, are responsible for various reliability issues. The RSC, CC and RCC also provide technical policy recommendations to the Board. All General and Full Members are eligible for representation on the technical committees.

Industry technical experts from within the membership provide valuable input to the Board through various working groups and task forces as well as the committees. The *Amended and Restated Bylaws* establish NPCC's independence from users, owners and operators of the bulk power system through the enhanced governance structure while providing fair stakeholder representation in the election of the Board of Directors and officers. The members, from each of the seven stakeholder voting sectors, vote to elect directors in their respective sector. The *Amended and Restated Bylaws* establish criteria for board service for both stakeholder and independent directors. Independent Directors are drawn from diverse backgrounds and possess a broad range of industry expertise, perspectives, experiences, skill sets and knowledge to contribute to the effective functioning of a hybrid board structure.

Compliance and enforcement activities are carried out by the NPCC compliance staff and are independent of all users, owners and operators of the international bulk electric system. Compliance activities are governed in the United States by the *Amended and Restated Regional Delegation Agreement* between NERC and NPCC, delegating portions of NERC's authority as the ERO to NPCC. NPCC compliance activities in Canada are governed by individual provincial Memorandum of Understanding (MOU) or Agreements with each province providing the unique parameters for compliance and enforcement activities for each of the provinces. An MOU between the Independent Electricity System Operator in Ontario (IESO), NERC and NPCC establishes roles and responsibilities with regard to that province. NPCC, NERC and the New Brunswick Energy and Utilities Board are parties to a MOU that sets forth reliability activities for New Brunswick. The Régie de l'énergie, NERC and NPCC executed an Agreement regarding the implementation of the Québec reliability standards compliance monitoring and enforcement program. NPCC, NERC and Nova Scotia executed a MOU that sets forth the mutual understanding of the parties in relation to the approval and implementation of NERC Reliability Standards and NPCC Regional reliability criteria for the province of Nova Scotia.

International Foundation

The Regional Entity functions and services differ according to particular regulatory backstop:

a) U.S. Foundation

The Federal Energy Regulatory Commission (FERC) certified NERC as the Electric Reliability Organization (ERO) on July 20, 2006. The ERO is responsible for developing and enforcing reliability standards within the United States. In executing part of its responsibilities, NERC delegates authority to the Regional Entities to perform certain functions through delegation agreements. Ensuring the reliability of the bulk power system in the State of New York and the six New England States was delegated from NERC to NPCC through the Amended and Restated Regional Delegation Agreement.

b) Ontario

On February 5, 2010, NERC, NPCC and the IESO amended and restated their earlier MOU, dated November 29, 2006, setting forth their mutual understanding as regards NERC's and NPCC's status in Ontario with respect to standard and criteria development, compliance enforcement, and other related matters. The IESO, whose statutory responsibilities include making and enforcing reliability standards, and making and enforcing Ontario market rules that govern the IESO-controlled grid and the wholesale electricity market, was established April 1, 1999 as the Independent Electricity Market Operator in Ontario under the *Electricity Act, 1998* (Ontario). The IESO is subject to the regulatory oversight of the Ontario Energy Board (OEB).

Among other things, the MOU recognizes that NERC and NPCC are standards authorities under the *Electricity Act, 1998* (Ontario). Additionally, under the authority of that same legislation, and as memorialized in the MOU, the NERC reliability standards and NPCC reliability criteria have effect in Ontario. However, a 2008 amendment to the *Electricity Act, 1998* (Ontario) allows the OEB to review these standards and criteria and issue orders preventing their implementation and remanding them back to NERC and NPCC.

The IESO is subject to compliance monitoring and enforcement by NPCC. The IESO is also subject to compliance monitoring and enforcement of the Ontario market rules by the IESO's Market Assessment and Compliance Division (MACD) that operates at arm's length from the IESO's business units. The MOU notes that where MACD, NERC, and NPCC engage in investigations pursuant to their respective mandates regarding compliance, MACD can request to

take the lead. Moreover, of the three, MACD is the only entity that can assess financial penalties for any Ontario market participant's or the IESO's non-compliance with Ontario market rules, which includes non-compliance with NERC standards and NPCC criteria.

The MOU provides for a peer review process to promote the common compliance and enforcement objectives of NERC/NPCC and MACD. From the perspective of NPCC and NERC, this process, in part, is meant to assure registered entities outside of Ontario that the MACD program is rigorous, thorough and reliable.

The IESO is subject to NPCC assessments of compliance, including audits, as well as NPCC remedial action directives to correct non-compliance. In the event that the IESO disagrees with NPCC's finding of a violation or associated assessment of sanctions in connection with standards and criteria, the IESO has a right to a compliance hearing with NPCC.

c) Québec

The Régie de l'énergie, NERC and NPCC are parties to the May 8, 2009 *Agreement on the Development of Electric Power Transmission Reliability Standards and of Procedures and a Program for the Monitoring of the Application of These Standards for Québec* (the 2009 Agreement). Under the terms of the 2009 Agreement, the Régie de l'énergie, which is charged with ensuring the reliability of the electric transmission in Québec, retained NPCC and NERC as experts to develop reliability standards and monitoring program procedures for the Province.

The Régie de l'énergie, NERC and NPCC are parties to the September 24, 2014 *Agreement on the Implementation of the Québec Reliability Standards Compliance Monitoring and Enforcement Program* (the 2014 Agreement). Through the 2014 Agreement, the Régie de l'énergie retains the services of NPCC to monitor and assess the compliance of registered entities in Québec with the reliability standards adopted by the Régie with respect to electric power transmission in Québec.

On April 1, 2015, the Québec Reliability Standards Compliance Monitoring and Enforcement Program ("QCMEP"), which was developed jointly by the Régie de l'énergie, NPCC and NERC, came into effect. Together, the 2014 Agreement and the QCMEP detail the procedures and program for monitoring and enforcing mandatory electric power transmission reliability standards in Québec.

The Régie de l'énergie is a public body established by the *Act respecting the Régie de l'énergie* (the Act). Pursuant to its authority under the Act, the Régie de l'énergie, through a series of decisions in 2007, designated Hydro-Québec Contrôle des mouvements d'énergie (HQCMÉ), a division of Hydro-Québec TransÉnergie, as the Reliability Coordinator for Québec. In accordance with its mandate and as recognized in the 2009 Agreement, it is this entity that is responsible for the filing with the Régie de l'énergie for approval of reliability standards in Québec. HQCMÉ has filed for the approval of certain reliability standards and the Régie de l'énergie has made certain reliability standards mandatory in Québec and is continuing proceedings to make additional reliability standards mandatory in Québec.

NPCC also conducts reliability assurance activities within Québec, including but not limited to events analysis, Reliability Assessment and Performance Analysis and compliance investigations, consistent with the *NPCC Amended and Restated Bylaws*.

d) New Brunswick

On October 1, 2013, the Electricity Act (NB) and implementing regulations (together, “NB Electricity Act”) amended how Reliability Standards are approved, monitored, and enforced in the province of New Brunswick. The NB Electricity Act designates NPCC as a compliance body and NERC as a standards body within the meaning of the NB Electricity Act. The New Brunswick Energy and Utilities Board (NBEUB) is an independent, quasi-judicial board that is responsible for regulating New Brunswick’s electricity sector under the NB Electricity Act. The NBEUB has the responsibility to adopt and enforce reliability standards in New Brunswick.

As contemplated in the NB Electricity Act, NPCC and the NBEUB entered into a Service Contract dated August 10, 2016, whereby NPCC provides CMEP and other services for the NBEUB. Additionally, the NBEUB, NPCC, and NERC entered into a Memorandum of Understanding on August 10, 2016, which describes the roles and responsibilities of the three entities and facilitates data sharing. These two documents, along with the NB Electricity Act are the governing documents with respect to conducting CMEP and other reliability related activities in New Brunswick.

With respect to the approval of reliability standards, the NB Electricity Act provides that all of the NERC Reliability Standards that were effective in New Brunswick prior to October 1, 2013 continue to be effective in New Brunswick after October 1, 2013. Additionally, the New Brunswick Power Corporation (“NB Power”) is required to file for approval, modification, or retirement of NERC Reliability Standards 60 days after a NERC Reliability Standard is approved, modified, or retired by the Federal Energy Regulatory Commission (“FERC”). The NBEUB rules on the filed Reliability Standard after considering (a) the potential impact on the reliability of the bulk power system, (b) the potential cost and benefits (c) the public interest, and (d) any other factors that the NBEUB considers relevant. The Electricity Act requires the NBEUB to notify NPCC and NERC of an application by NB Power with respect to reliability standards and provide for a 60 day comment period. The NBEUB is required to approve the reliability standards if there are not substantive modifications proposed from the FERC approved NERC Reliability Standard and there were no substantive comments filed. Amendments to the reliability standard to make them compatible with New Brunswick or Canadian law are considered non-substantive. The approval of reliability standards may be subject to a hearing for several reasons, including substantive comments from NPCC or NERC.

With respect to the monitoring and enforcement of the Reliability Standards in New Brunswick, the NB Electricity Act provides for NPCC to identify entities that must register with the NBEUB in the New Brunswick specific registry. Additionally, NPCC may carry out the compliance monitoring and assessment for the NBEUB and assist and advise the enforcement for the NBEUB, including financial penalties. NPCC is also permitted to carry out or exercise any power in the implementing regulations that is specific to the NBEUB, as provided for in the Service Contract. Additionally, NPCC has the powers of an inspector, which permits NPCC to audit and spot check entities within New Brunswick.

e) Nova Scotia

Nova Scotia Power Incorporated (NSPI), NPCC and NERC are parties to a May 11, 2010 Memorandum of Understanding regarding the approval and implementation of mandatory NERC reliability standards and NPCC Regional reliability criteria. Pursuant to the MOU’s terms, NERC and NPCC filed standards and criteria with the Nova Scotia Utility and Review Board (NSUARB) for approval on June 30, 2010 and June 29, 2010, respectively. A decision from the NSUARB on both NERC and NPCC filings was rendered on July 20, 2011. Hence, the

standards and criteria are mandatory in Nova Scotia and NSPI will be subject to the NERC compliance monitoring and enforcement program, as implemented by NPCC.

NPCC will conduct compliance and enforcement activities with respect to the standards and forward any non-compliance information and recommendations to the NSUARB. The NSUARB maintains the final authority with respect to enforcement in Nova Scotia and based on the recommendations from NPCC, may determine whether a violation has occurred and, if so, what remedial measures or non-monetary penalties should be imposed.

Regional Entity Division Functional Scope

NPCC's Regional Entity division functions in support of the ERO include:

- Active participation in the development of North American Reliability Standards for the bulk electric system, and as needed development of Reliability Standards applicable within the NPCC cross-border Regional Entity.
- Monitoring and enforcement of approved Reliability Standards, including the registration of responsible entities, and as needed certification of such entities.
- Assessment of the present and future reliability of the bulk power system.
- Operational coordination and situation awareness support.
- Event analysis and identifying lessons learned to improve reliability.
- Effective training and education of reliability personnel.
- Promoting the protection of critical electric infrastructure.

In recognition of the delegated compliance role of Regional Entities as an important means to enhancing reliability, NPCC has designated a significant percentage of its staff resources to compliance monitoring and enforcement. NPCC has also developed and deployed a robust set of online tools for gathering data, analysis, and tracking of compliance information to support its ability to carry out its responsibilities in a cost effective manner.

NPCC has organized the remaining staff into program areas consistent with EAct 2005 to address the other functions listed above. These experts in operations, planning and reliability analysis assist registered entities in assessing and improving reliability. It is in support of these areas that NPCC engages the majority of industry experts on its technical committees.

2018 Key Assumptions and 2018 Goals and Key Deliverables

NERC and the eight Regional Entities collaborated in the development of a common operating model with complementary roles and responsibilities, an ERO Enterprise Strategic Plan, and a set of business planning assumptions, goals, metrics and key deliverables for the 2017 through 2019 period. The results from that collaboration, which incorporated risks identified by the Reliability Issues Steering Committee, are included as a set of Shared Business Plan and Budget Assumptions that will be contained in Exhibit A to the NERC 2018 Business Plan and Budget and may be referenced by the users of this document. NPCC activities that support ERO Enterprise Goals are detailed in each of the following program area sections.

2018 Overview of Regional Entity Division Cost Impacts

The proposed Regional Entity division assessment of \$14,341,787 to support the budget is an increase of 0.6% compared to the 2017 assessment of \$14,255,061.

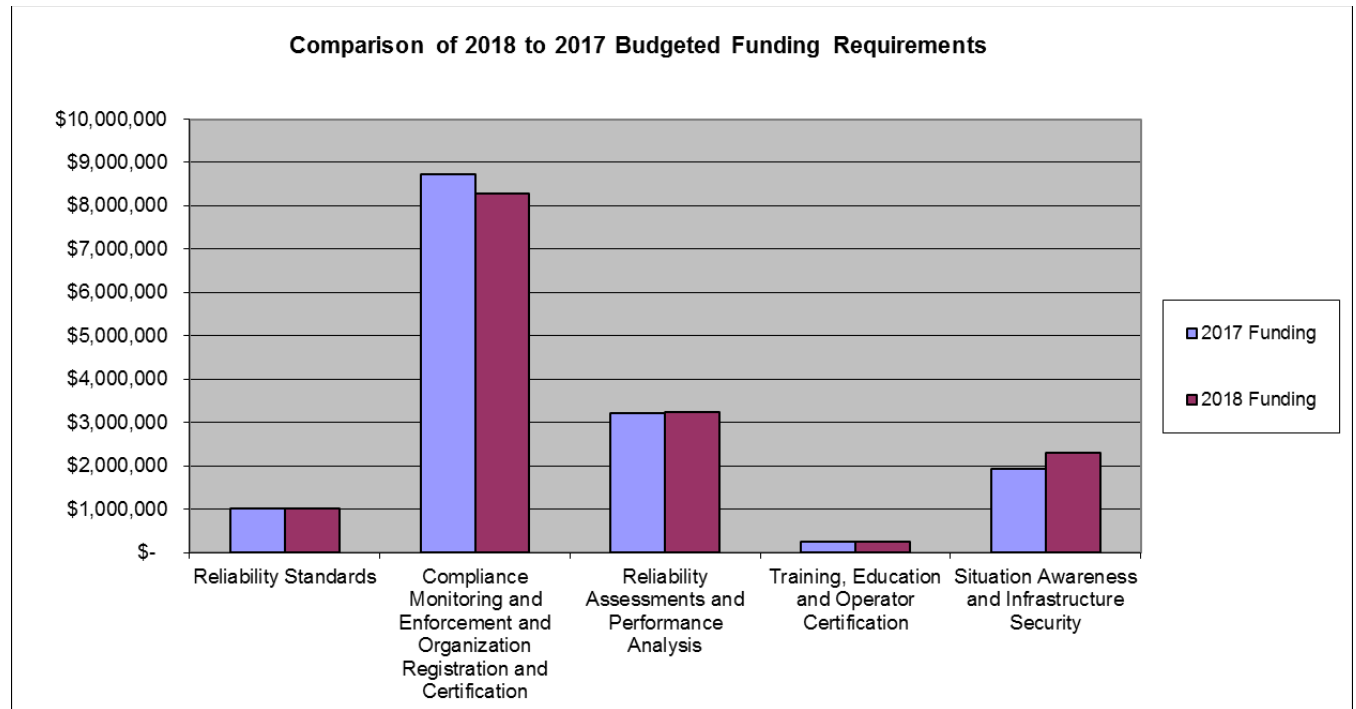
2017 Projections

Current year projections are taken into consideration in development of the budget. Expenses are currently projected to be on budget in all areas or slightly under budget. 2017 Projections reflect expectations based on the first quarter variance report. It is anticipated that projections could change throughout 2017 and would be reflected in each subsequent quarter's variance report.

Summary by Program

Program	Budget 2017	Projection 2017	Budget 2018	Variance	
				2018 Budget v 2017 Budget	Variance %
Reliability Standards	\$ 1,022,328	\$ 1,022,328	\$ 1,010,246	\$ (12,083)	-1.2%
Compliance Monitoring and Enforcement and Organization Registration and Certification	\$ 8,726,049	\$ 8,726,049	\$ 8,293,748	\$ (432,301)	-5.0%
Reliability Assessments and Performance Analysis	\$ 3,206,966	\$ 3,206,966	\$ 3,240,721	\$ 33,755	1.1%
Training, Education and Operator Certification	\$ 248,658	\$ 248,658	\$ 249,051	\$ 393	0.2%
Situation Awareness and Infrastructure Security	\$ 1,943,053	\$ 1,943,053	\$ 2,313,202	\$ 370,148	19.0%
Total	\$ 15,147,054	\$ 15,147,054	\$ 15,106,967	\$ (40,087)	-0.3%

This chart does not include allocation of working capital requirements among the Program Areas.



This chart does not include allocation of working capital requirements among the Program Areas.

Personnel Analysis

Total FTEs by Program Area	Budget 2017	Projection 2017	Direct FTEs 2018 Budget	Shared FTEs ¹ 2018 Budget	Total FTEs 2018 Budget	Change from 2017 Budget
REGIONAL ENTITY DIVISION						
Operational Programs						
Reliability Standards	1.93	1.93	1.00	0.93	1.93	0.00
Compliance Monitoring and Enforcement and Organization Registration and Certification	17.00	16.00	16.00	0.00	16.00	-1.00
Training, Education, and Operator Certification	0.10	0.10	0.10	0.00	0.10	0.00
Reliability Assessment and Performance Analysis	5.83	5.83	4.90	0.93	5.83	0.00
Situation Awareness and Infrastructure Security	4.00	5.00	5.00	0.00	5.00	1.00
Total FTEs Operational Programs	28.86	28.86	27.00	1.86	28.86	0.00
Administrative Programs						
Technical Committees and Member Forums	0.50	0.50	0.50	0.00	0.50	0.00
General and Administrative	2.50	2.50	2.50	0.00	2.50	0.00
Information Technology	2.00	2.00	2.00	0.00	2.00	0.00
Legal and Regulatory	1.00	1.00	1.00	0.00	1.00	0.00
Human Resources	1.00	1.00	1.00	0.00	1.00	0.00
Accounting and Finance	1.00	1.00	1.00	0.00	1.00	0.00
Total FTEs Administrative Programs	8.00	8.00	8.00	0.00	8.00	0.00
Total FTEs	36.86	36.86	35.00	1.86	36.86	0.00

¹A shared FTE is defined as an employee who performs both Regional Entity and Criteria Services division functions.

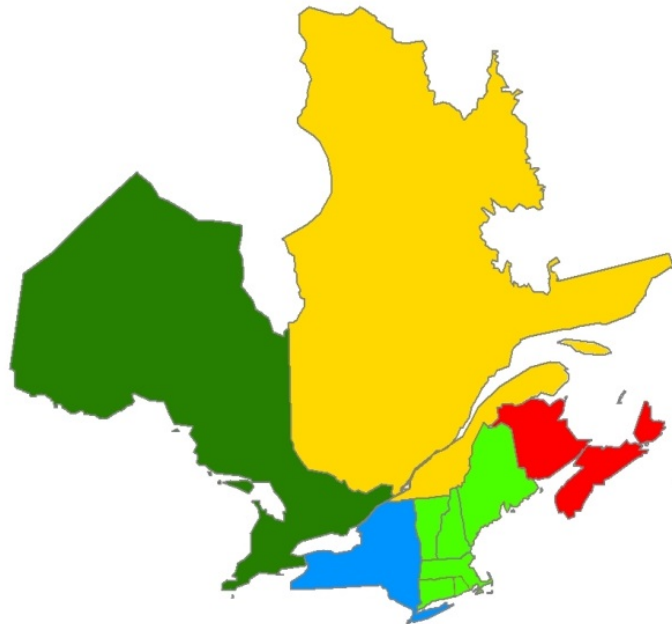
2017 Budget and Projection and 2018 Budget Comparisons

Statement of Activities and Capital Expenditures						
2017 Budget & Projection, and 2018 Budget						
REGIONAL ENTITY DIVISION						
				Variance ⁽²⁾		Variance
	2017	2017	2017 Projection	v 2017 Budget	2018	2018 Budget
	Budget	Projection	Over(Under)	Over(Under)	Budget	v 2017 Budget
						Over(Under)
Funding						
ERO Funding						
ERO Assessments	\$ 14,255,061	\$ 14,255,061	\$ -		\$ 14,341,787	\$ 86,726
Penalty Sanctions ⁽¹⁾	-	-	-		75,000	75,000
Total ERO Funding	\$ 14,255,061	\$ 14,255,061	\$ -		\$ 14,416,787	\$ 161,726
Membership Dues	-	-	-		-	-
Testing Fees	-	-	-		-	-
Services & Software	-	-	-		-	-
Workshops	64,000	64,000	-		64,000	-
Interest	-	-	-		-	-
Miscellaneous	-	-	-		-	-
Total Funding (A)	\$ 14,319,061	\$ 14,319,061	\$ -		\$ 14,480,787	\$ 161,726
Expenses						
Personnel Expenses						
Salaries	\$ 6,758,926	\$ 6,758,926	\$ -		\$ 7,107,599	\$ 348,673
Payroll Taxes	404,319	404,319	-		411,440	7,121
Benefits	1,415,603	1,415,603	-		1,476,378	60,774
Retirement Costs	847,223	847,223	-		825,353	(21,869)
Total Personnel Expenses	\$ 9,426,071	\$ 9,426,071	\$ -		\$ 9,820,770	\$ 394,699
Meeting Expenses						
Meetings	\$ 377,100	\$ 377,100	\$ -		\$ 353,050	\$ (24,050)
Travel	855,232	855,232	-		834,500	(20,732)
Conference Calls	37,000	37,000	-		37,000	-
Total Meeting Expenses	\$ 1,269,332	\$ 1,269,332	\$ -		\$ 1,224,550	\$ (44,782)
Operating Expenses						
Consultants & Contracts	\$ 2,009,000	\$ 2,009,000	\$ -		\$ 1,877,640	\$ (131,360)
Office Rent	809,700	809,700	-		810,700	1,000
Office Costs	679,100	679,100	-		664,760	(14,340)
Professional Services	1,041,000	1,041,000	-		960,000	(81,000)
Computer & Equipment Leases	-	-	-		-	-
Miscellaneous	50,000	50,000	-		50,000	-
Depreciation	250,000	250,000	-		269,000	19,000
Total Operating Expenses	\$ 4,838,800	\$ 4,838,800	\$ -		\$ 4,632,100	\$ (206,700)
Total Direct Expenses	\$ 15,534,203	\$ 15,534,203	\$ -		\$ 15,677,420	\$ 143,217
Indirect Expenses	\$ (413,149)	\$ (413,149)	\$ -		\$ (416,453)	\$ (3,304)
Other Non-Operating Expenses	\$ -	\$ -	\$ -		\$ -	\$ -
Total Expenses (B)	\$ 15,121,054	\$ 15,121,054	\$ -		\$ 15,260,967	\$ 139,913
Change in Assets	\$ (801,994)	\$ (801,994)	\$ -		\$ (780,180)	\$ 21,813
Fixed Assets						
Depreciation	\$ (250,000)	\$ (250,000)	\$ -		\$ (269,000)	\$ (19,000)
Computer & Software CapEx	276,000	276,000	-		115,000	(161,000)
Furniture & Fixtures CapEx	-	-	-		-	-
Equipment CapEx	-	-	-		-	-
Leasehold Improvements	-	-	-		-	-
Allocation of Fixed Assets	0	0	-		0	-
Inc(Dec) in Fixed Assets (C)	26,000	26,000	-		(154,000)	(180,000)
TOTAL BUDGET (=B+C)	\$ 15,147,054	\$ 15,147,054	\$ -		\$ 15,106,967	\$ (40,087)
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (827,994)	\$ (827,994)	\$ -		\$ (626,180)	\$ 201,813

⁽¹⁾ \$75,000 of penalty sanctions collected to date and prior to June 30, 2017.

⁽²⁾ 2017 Projections reflect expectations based on the 1st quarter statement of activities. It is anticipated that projections could change throughout 2017 and would be reflected in each subsequent quarter's statement of activities.

Section A – Regional Entity Division 2018 Business Plan and Budget



Section A — 2018 Regional Entity Division Business Plan and Budget

Reliability Standards Program

Reliability Standards Program Resources			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	1.93	1.93	0.00
Direct Expenses	\$658,082	\$647,633	(\$10,448)
Indirect Expenses	\$372,606	\$375,586	\$2,980
Other Non-Operating Expenses	\$0	\$0	\$0
Inc(Dec) in Fixed Assets	(\$8,359)	(\$12,974)	(\$4,614)
Total Funding Requirement	\$1,022,328	\$1,010,246	(\$12,083)

Program Scope and Functional Description

The NPCC Reliability Standards Program Area operates in accordance with NPCC’s filed and approved Delegation Agreement and NERC Rules of Procedure Section 300. The program supports the ERO standards program area roles and responsibilities, the 2018 ERO Enterprise Strategic Plan and 2018 Shared Business Plan and Budget Assumptions. NPCC’s Reliability Standards Program Area provides an efficient and effective mechanism for stakeholders to provide input and facilitate the development of reliability standards which are clear, responsive to reliability and security risks, practical to implement, “results based”, and are cost effective. The primary objectives of NPCC’s Reliability Standards Program Area is to support the development of ERO standards which establishes “results-based” requirements for addressing reliability risks with due consideration given to cost effectiveness. NPCC supports the ERO efforts to develop reliability standards in a timely and efficient manner and which are responsive to FERC Directives and industry risk. ERO and Regional Reliability Standards must ensure the bulk electric system is planned, operated, and maintained in a manner that minimizes risks of cascading failures, avoids damage to major equipment, is responsive to risks, or limits interruptions of bulk power supply.

At the Regional level, the standards program area develops, and maintains NPCC Regional Reliability Standards, ERO Standards Variances for the northeast as required. In addition, the NPCC Reliability Standards Program Area provides oversight to ensure that NPCC’s Regional Reliability Criteria contained in the form of Directories, are developed and maintained as necessary to implement, to augment, or to comply with NERC Reliability Standards, but which are not Reliability Standards. Regional Reliability Criteria may also address issues not within the scope of Reliability Standards, such as resource adequacy and conform to requirements in Section 313 of the NERC Rules of Procedure.

The NPCC Reliability Standards Program Area supports and participates in the development, revision, and maintenance of NERC ERO Reliability Standards, initiates new, or revisions to, continent-wide reliability standards through the NERC Standards Authorization Request (SAR) process when necessary, and provides a forum for the comprehensive review and improvement of existing and developing reliability standards. NPCC also provides coordination and represents the other seven NERC Regional Entities for the NERC Enhanced Periodic Review process through participation on the Enhanced Periodic Review Standing Team (EPRST). The EPRST reviews existing NERC standards and grades them for quality and content in an effort to

prioritize standards development work. This prioritization will be based on potential reliability gaps and identify opportunities for improving the ERO Reliability Standards as necessary. The Enhanced Periodic Review (EPR) process will also identify standards of sufficient quality and not needing any revision which may be considered for reaffirmation by the NERC BOT. The NPCC Reliability Standards Program Area also facilitates and assists stakeholders with initiating SARs and Requests for Interpretation of ERO standards for those entities within the NPCC footprint. In 2017, NPCC instituted a feedback mechanism from the Compliance, Event Analysis, RAPA and Criteria Services program area which provides a process to identify and improve standards. The standards program area will receive input from these other program areas and take appropriate action(s) to support the revision, retirement, or development of new standards to improve the ERO set of reliability standards and improve reliability of the Bulk Electric System. The NPCC Reliability Standards Program Area conducts its oversight and participation in the ERO standards development process by utilizing the NPCC Regional Standards Committee (RSC) to ensure transparency and facilitate stakeholder input.

The NPCC Reliability Standards Program Area supports the reliability of the bulk electric system by:

- Facilitating active participation of NPCC Regional industry stakeholders in all NERC Reliability Standards activities to promote the development of results-based, cost effective, clear and concise quality standards in a timely and efficient manner.
- Providing NPCC Staff selective support for standard development activities as outlined in the NERC 2018-2020 Reliability Standards Development Plan (RSDP).
- Participating in and representing the other Regional Entities on the EPRST which evaluates need to revise existing standards, prioritizes the standards development projects for the future year's RSDP, and allows the Regions to identify opportunities to replace Regional Standards with Variances in the continent wide standards.
- Support ERO outreach during standard development by providing a forum for all NPCC representatives on the NERC drafting teams to raise issues, socialize concepts with stakeholders, and receive feedback on the standards during the development process to enhance efficiency and timeliness of standards development.
- Assisting NERC with the evaluation of the standards from a "cost effectiveness" perspective by supporting ongoing pilots and participating in the development of a formal, repeatable process.
- Promoting awareness by holding NPCC Regional workshops to provide outreach and conducting Regional Standards Committee meetings to inform and educate stakeholders on standards being developed, modified or maintained.
- Utilizing input received from the NPCC Regional feedback mechanisms, identify and initiate improvements to NERC standards through the appropriate process(es).
- Actively participate and review the work of the NERC Reliability Issues Steering Committee (RISC) which identifies emerging risks to the BES.
- Coordinating and sharing activities and useful information such as presentations, implementation documents and training materials as necessary with Standards Program Areas from other Regions to enhance efficiencies and promote consistency amongst the Regions.
- Developing and maintaining Regional Standards as necessary to address Regional reliability related issues or risks and ensure those standards set more stringent reliability requirements than the associated NERC Reliability Standard or cover matters not covered

by an existing NERC Reliability Standard all in accordance with Section 312 of the NERC Rules of Procedure.

- Pursuing retirement of Regional Standards through promoting the reliability objectives of those Regional Standards into the NERC Continent-wide standards and developing Variances to the NERC standards where possible to capture the reliability objectives of the Regional Standards.
- Maintaining and abiding by the NPCC Regional Standard Processes Manual assuring compliance with all FERC filed documents with respect to standards development.

2018 Key Assumptions

- The number of continent-wide Reliability Standards development projects is expected to remain relatively stable, except as required to address any new FERC directives to create or modify Reliability Standards, or industry submittals of standard authorization requests.
- Continent-wide Reliability Standards projects will consist primarily of conducting periodic reviews on existing Reliability Standards to improve their content and quality, respond to identified risks to reliability (including those that may be identified through the implementation of risk-based Compliance Monitoring and Enforcement), and address FERC directives that may arise. This activity will require the allocation of technical resources from several internal NERC departments (e.g., Reliability Assessment and Performance Analysis (RAPA), Reliability Risk Management, Compliance Analysis and Certification, and Compliance Assurance) and support from across the ERO Enterprise.
- During the periodic review of Reliability Standards, any associated Regional Reliability Standards will be reviewed for potential incorporation as variances or as improvements to the continent-wide requirements. Regional and NERC Reliability Standards development processes may require modification to efficiently accomplish this task. NPCC will work with NERC and other Regional Entities as necessary on projects where there is a Regional Reliability Standard/variance.
- NPCC's Regional Reliability Standards development activity is expected to remain low, driven by requests that the Regional Entity may receive or reliability issues that are identified.
- In coordination with NERC's Standard Drafting Teams and consistent with current approaches, NPCC will support outreach during standard development and participate in the standard development activities as may be required to address reliability and stakeholder issues that may arise.
- Following FERC approval, NPCC will assist with the transition of Reliability Standards to compliance monitoring and enforcement by supporting industry and auditor training or providing information regarding the intent of the Reliability Standard.
- The number of NERC and Regional standards interpretations is expected to remain low. However, implementation guidance requests may increase. The NPCC Reliability Standards program area will assist and facilitate support of these activities.
- Consistent with the NERC Rules of Procedure Sections 312 and 313, as continent wide standards continue to evolve, NPCC Regional Standards and Criteria will need to be continually reviewed to ensure they augment but do not add duplicity to the ERO standards.

2018 Goals and Key Deliverables

The Reliability Standards program goals and objectives for 2018 are grouped into the following categories:

1) Participate in the ERO Results-Based Standards Development

- Participate in the annual development and revision of the NERC’s three year Reliability Standards Development Plan (RSDP) through review, commenting, and other RSC activities.
- Participate in the NERC Standards Committee, as a representative of the NERC Regional Entities and NPCC Regional stakeholders to advance strategic initiatives, to measure the effectiveness and quality of standards, support ERO efforts to address outstanding FERC Directives, and provide input in the prioritization of standards development projects.
- Support further development of cost effectiveness principles using the “Cost of Risk Reduction Analysis” (CRRA) process and pilots. Continue to provide insights to NERC, based on NPCC experiences, regarding strategy for developing cost effectiveness analysis for standards and identify opportunities to identify cost of risk mitigation for the draft standards.
- Participate in the development of ERO Reliability Standards specified in NERC’s three-year Reliability Standards Development Plan with the emphasis placed on reducing the amount of new FERC Directives issues by closer coordination with the Commission staff.
- Conduct thorough reviews of all NERC standards under development or revision by leveraging existing NPCC Task Forces and subject matter experts and coordinate NPCC comments for Northeastern North America.
- Participate in the Enhanced Periodic Review Standing team’s grading efforts and coordinate and represent the Regional and interregional input.
- Assist NERC’s review of all industry “Requests for Interpretations” of standards.
- NPCC staff and regional drafting team volunteers, will participate in the drafting of ERO standards and provide support for development of improvements to standards.
- NPCC and its members will review and coordinate comments on FERC staff informal assessments of the ERO Enterprise as appropriate.
- Participate in pre-ballot reviews of ERO standards and coordinate the development of consensus recommendations of the NPCC Members to the NERC Standards Drafting Team (SDT) and provide a list of any unaddressed issues to allow the Members to cast a ballot based on regional concerns to enhance the efficiency of the ERO standards development projects.
- Review and identify issues and concerns raised in FERC NOPRs and NOIs for any and all standards related issues as appropriate.
- Educate and notify stakeholders and regulators about issues related to standards development through various means such as webinars and workshops.
- Provide outreach to industry trade groups such as the North American Generator Forum and North American Transmission Forum when requested.
- Monitor the NERC RISC activities and provide a Regional point of contact for all potential reliability related risks and gaps within the Northeast or as noted by NPCC’s stakeholders.
- Participate in and provide support to critical standards projects, such as CIP Supply Chain, Facility Ratings (IROL and SOL development), Geomagnetic Disturbances, etc.

- Identify opportunities and initiate Regional Variances to the NERC Reliability Standards as soon as possible, allowing incorporation into the continent wide standard during the development process.
- Provide support and assistance to the ERO, as needed, for conducting Quality Review activities on NERC continent-wide standards and related materials.
- Continue to develop new and innovative processes to better utilize the limited internal and external resources in the Region to enable sufficient technical review of posted standards and related materials.
- Support the ERO and the relationships with FERC and applicable provincial governmental authorities for standards development activities as necessary to accomplish the ERO's strategic goals and objectives.
- Participate in the improvement of NERC standards through lessons learned and various ERO and Regional feedback mechanisms using input from Compliance, RAPA, Event Analysis, and stakeholders.
- Provide support to the Compliance Guidance Policy activities as required.
- Provide support to ERO staff for FERC related matters in the area of standards development such as pre-filing meetings, preparation of filings, and technical conference participation.

2) Regional Standards Development

- NPCC does not plan on developing further Regional Standards but reserves the right to do so if a reliability issue exists that is not appropriate for continent-wide development.
- NPCC will perform clarifications, revisions to, or reaffirmations as needed to existing approved Regional Standards in accordance with all NERC Rules of Procedures and NERC and Regional Standards processes.
- During the periodic review process, conduct a review for opportunities to include Regional Standards as Variances into the associated NERC continent wide standards.
- Conduct reviews of Regional Standards as necessitated by the revision and approval of any associated Continent-wide NERC reliability standards or further reliability related need.
- Conduct the development of any Québec Interconnection Wide variances to NERC continent wide standards using the NPCC Reliability Standards Development Process.

3) Standards Improvement

- Advance NPCC's reliability goals and objectives by promoting these reliability objectives during continent-wide standard development projects.
- Support long-term strategy for standards improvement, help develop and initiate implementation of more efficient processes.
- Identify any reliability related need for additional Regional Standards opportunities if continent-wide standards are not an appropriate or possible solution.
- Ensure the topics addressed by the Reliability Standards align with changing industry and reliability objectives.
- Participate in reliability metrics activities to identify potential measures for benchmarking of reliability and standards to determine if an adequate level of reliability is being achieved through the Enhanced Periodic Review Standing Team activities.
- Identify opportunities and processes for cost-effectiveness CRRA analysis activities to determine the need to revise a standard during the EPR process.

-
- Identify any emerging interconnection-wide reliability issues which may need standards solutions and forward to the NERC Reliability Issues Steering Committee for their consideration.
 - Identify opportunities to increase reliability or mitigate emerging risk through the revision of standards and their associated requirements.

4) Business Practices Interface

- Identify any North American Electric Standards Review Board (NAESB) activities which may impact ERO standards.
- Identify potential market related issues for Regional Standards through NPCC RSC coordination and reviews.

Based on the portion of professional/technical staff time and other resources devoted to Reliability Standards development, NPCC estimates that it will expend approximately 7% of its resources on this activity.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Reliability Standards Program

Funding sources and related expenses for the Reliability Standards section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures 2017 Budget & Projection, and 2018 Budget						
Reliability Standards						
	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)	
Funding						
ERO Funding						
ERO Assessments	\$ 1,022,328	\$ 1,022,328	\$ -	\$ 1,005,230	\$ (17,098)	
Penalty Sanctions	-	-	-	5,016	5,016	
Total ERO Funding	\$ 1,022,328	\$ 1,022,328	\$ -	\$ 1,010,246	\$ (12,083)	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	-	-	-	-	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 1,022,328	\$ 1,022,328	\$ -	\$ 1,010,246	\$ (12,083)	
Expenses						
Personnel Expenses						
Salaries	\$ 370,220	\$ 370,220	\$ -	\$ 377,093	\$ 6,873	
Payroll Taxes	21,273	21,273	-	21,390	116	
Benefits	97,411	97,411	-	98,851	1,441	
Retirement Costs	43,020	43,020	-	40,299	(2,721)	
Total Personnel Expenses	\$ 531,925	\$ 531,925	\$ -	\$ 537,633	\$ 5,709	
Meeting Expenses						
Meetings	\$ 13,000	\$ 13,000	\$ -	\$ 7,000	\$ (6,000)	
Travel	103,157	103,157	-	93,000	(10,157)	
Conference Calls	-	-	-	-	-	
Total Meeting Expenses	\$ 116,157	\$ 116,157	\$ -	\$ 100,000	\$ (16,157)	
Operating Expenses						
Consultants & Contracts	\$ 10,000	\$ 10,000	\$ -	\$ 10,000	\$ -	
Office Rent	-	-	-	-	-	
Office Costs	-	-	-	-	-	
Professional Services	-	-	-	-	-	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Depreciation	-	-	-	-	-	
Total Operating Expenses	\$ 10,000	\$ 10,000	\$ -	\$ 10,000	\$ -	
Total Direct Expenses	\$ 658,082	\$ 658,082	\$ -	\$ 647,633	\$ (10,448)	
Indirect Expenses	\$ 372,606	\$ 372,606	\$ -	\$ 375,586	\$ 2,980	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ 1,030,688	\$ 1,030,688	\$ -	\$ 1,023,220	\$ (7,468)	
Change in Assets	\$ (8,359)	\$ (8,359)	\$ -	\$ (12,974)	\$ (4,614)	
Fixed Assets						
Depreciation	\$ -	-	\$ -	-	\$ -	
Computer & Software CapEx	-	-	-	-	-	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	(8,359)	(8,359)	-	(12,974)	(4,614)	
Inc(Dec) in Fixed Assets (C)	(8,359)	(8,359)	-	(12,974)	(4,614)	
TOTAL BUDGET (=B+C)	\$ 1,022,328	\$ 1,022,328	\$ -	\$ 1,010,246	\$ (12,083)	

Compliance Monitoring and Enforcement and Organization Registration and Certification Program

Compliance Monitoring and Enforcement and Organization Registration and Certification Program Resources			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	17.00	16.00	-1.00
Direct Expenses	\$5,366,656	\$5,247,634	(\$119,022)
Indirect Expenses	\$3,282,024	\$3,113,668	(\$168,356)
Other Non-Operating Expenses	\$0	\$0	\$0
Inc(Dec) in Fixed Assets	\$77,369	(\$67,554)	(\$144,922)
Total Funding Requirement	\$8,726,049	\$8,293,748	(\$432,301)

Program Scope and Functional Description

The Compliance Monitoring and Enforcement and Organization Registration and Certification Program (CORC) Program scope covers: 1) the identification, registration and certification of those entities responsible for meeting the NERC Reliability Standards and any approved Regional Standards; 2) the implementation of the risk-based NERC Compliance Monitoring and Enforcement Program (CMEP) in the United States, including the compliance monitoring, assessment and enforcement of NERC Reliability Standards and Regional Reliability Standards; and 3) the implementation of compliance monitoring, assessment and enforcement recommendations in accordance with individual executed MOUs or Agreements in the Canadian Provinces of Ontario, Québec, New Brunswick and Nova Scotia.

The NPCC Compliance Committee (CC) is charged with providing objective stakeholder policy input to NPCC's implementation of the CMEP in the U.S. and compliance related activities under the above mentioned MOUs in the NPCC portion of Canada. With regard to NERC Reliability Standards and Regional Reliability Standards, the CC provides an oversight role of the independent NPCC compliance staff's implementation of the CMEP. In this oversight role the CC will review and endorse the processes used by the NPCC compliance staff in the conduct of the CMEP.

The NPCC compliance staff makes the initial and final determination of alleged violations and determines appropriate penalties and sanctions in accordance with the NERC *Sanction Guidelines*. To accomplish this objective, NPCC's compliance staff is further divided into four sub-program areas: Compliance Implementation and Registration; Compliance Entity Risk Assessment; Compliance Monitoring; and Compliance Enforcement.

Compliance Implementation, Registration and Certification

The Compliance Implementation and Registration sub-program is responsible for:

- a) Continuing to use the risk-based registration model to maintain an accurate registry and correctly identify all entities that are required to meet the NERC and Regional Reliability Standards.
- b) Performing the annual review of the recently created enhanced registration database, assuring that all entity data, such as latest entity risk assessment data, BES asset listing, etc. is correct and up to date.
- c) Representing NPCC on the NERC –led Review Panel whose role is to make decisions related to resolving identified registration issues, such as registered entities requests for a materiality assessment, an identification of an applicable subset of NERC Standard requirements, etc.
- d) Engaging with those registered entities who are requesting a materiality assessment or an identification of an applicable subset of requirements in advance of these issues being presented to the NERC-led Review Panel.
- e) Working within the ERO Enterprise on monitoring the progress of the development and implementation of new Registration and CMEP software reporting systems and tools.
- f) Developing and maintaining all NPCC and NERC CMEP Compliance Procedures, Compliance Instructions and all other CMEP related documentation.
- g) Developing and maintaining Performance Metrics that are used to measure the quality and effectiveness of CMEP Implementation and its impact on the reliability of the Bulk Electric System.
- h) Coordinating the implementation of NPCC Compliance Staff responsibilities as they pertain to the executed MOU with each of the Canadian Provinces in the NPCC Region.
- i) Day-to-day implementation of the CMEP.
- j) Developing NPCC’s annual CMEP Implementation Plan.
- k) Monitoring and assessment of guided self-certification, self-report, exception reporting, periodic data and complaint submittals.
- l) Updating and maintaining the CMEP Data Administration Application (CDAA).
- m) Implementing required changes and maintaining the Registration and Compliance portions of the NPCC website.
- n) Participating on various NERC and NPCC working groups to influence changes to Compliance processes, and support commonality of registration, monitoring, auditing, and enforcement approaches.

Compliance Monitoring Program

The Compliance Monitoring Program is charged with conducting both on-site and off-site compliance audits, spot checks, and guided self-certifications of NERC Reliability Standards in accordance with the NERC Rules of Procedure and associated NPCC procedures developed under the NPCC Compliance Implementation Program. NPCC’s Compliance Monitoring area provides supporting activities by implementation of the risk-based Compliance Monitoring and Enforcement Program (CMEP); and by use of consistent compliance monitoring practices focused on higher reliability risks. NPCC uses risk profiles from the IRAs (inherent risk assessments) as a baseline evaluation of reliability risks of an entity. NPCC also uses IRA summaries to guide its efforts to identifying key focus areas and evolving reliability risks. Internal Control Evaluations (ICE) are performed for registered entities that agree to identify key focus areas for a CMEP engagement. The result is a list of reliability requirements that merit a continued level of focus.

NPCC also supports the ERO Enterprise learning effort, as well as NERC oversight of program implementation. In collaboration with NERC, NPCC supports outreach programs in new CIP versions and in implementation of CIP-014 with anticipated expansion in the number and type of registered entities that require guidance. Compliance engagements are performed on the basis of risk to the BES and take into account the ERO reliability risk priorities. The Reliability Assessment (RA) group performs an IRA of all registered entities and forwards results to the manager of compliance to develop a schedule. Previous performed IRAs are amended and updated based on identified triggers. The yearly schedule is produced consistent with Risk Assessment of registered entities and the desired frequency of CMEP engagements. The schedule is posted annually on NERC and NPCC public websites.

Flexibility may be used in the CMEP engagement frequency based on the risk assessment and performance based assessment of each entity scheduled for an audit, and changes requiring certification. NPCC compliance monitoring is focused on the most significant risks to the BES. CMEP engagement may be in the form of an audit, spot check or guided self-certification and are led by qualified senior NPCC Staff. Compliance Oversight Plans are developed for registered entities to address the relevant risks. NPCC also conducts outreach, training, and education as necessary to support the implementation of new Reliability Standards.

Findings include the identification of any possible violations. Contents and processing of audit and spot check reports are in accordance with NERC directives for reporting. Specific lessons learned are factored into the program to promote continuous improvement and are presented at workshops. An annual comprehensive guided self-certification program is established based on the NERC and NPCC Risk Elements. Spot checks are based on NPCC's assessment of follow-ups on entities that have previously violated a Reliability Standard, follow-up on entities that have been involved in a significant system event, and other requirements which at the discretion of NPCC could pose a higher risk to reliability if not followed properly.

Resources from the Compliance Audit Program are also used to implement the Certification process for entities intending to register as new TOPs, BAs or RCs, as well as certification reviews of changes made by existing TOPs, BAs and RCs that meet the threshold requiring same. These actions are performed in support of the Compliance Registration Program which encompasses the Certification process. Resources for this activity, which is independent of the audit process, depend on the scope, function, and location of the entity being certified.

Compliance Entity Risk Assessment

The Entity Risk Assessment group conducts activity that informs the risk-based approach for CMEP engagement scoping. They conduct an entity's IRA prior to scoping the compliance engagement to determine which CMEP tool will be used.

Entity risk also includes an assessment of an entity's Internal Controls which is used for further refinement of requirements to be included in the engagement. While separate ICE engagements are voluntary and must be agreed to by the entity, internal controls may also be reviewed as needed during an audit.

Compliance Investigation

A Compliance Investigation (CI) may be initiated at any time by NPCC in response to a system disturbance, complaint, or possible violation of a Reliability Standard identified by any other means. The CI process requires the establishment of an investigation team that coordinates with

NERC and FERC as necessary; and also coordinates with the Situation Awareness Program Area.

Compliance Enforcement

In processing identified violations NPCC Compliance Enforcement strives to promote both timeliness and transparency of compliance results utilizing a risk-based compliance enforcement approach, including those efforts associated with meeting the enforcement metrics described below. In addition NPCC promotes the use of self-identification of non-compliance and implementation of discretion, including increased utilization of streamlined tracks such as FFT and discretion as shown below.

Compliance Enforcement responsibilities:

- a) Issuing all applicable notices including the Notice of Preliminary Screen; Notice of Compliance Exception; Notice of Possible Violation (NOPV), Notice of Find, Fix and Track (FFT) Treatment; Notice of Alleged Violation (NOAV), and the Notice of Confirmed Violation (NOCV).
- b) Conducting comprehensive enforcement investigations based on the facts and circumstances related to all possible violations of Reliability Standards, whether identified in an audit, a self-report, complaint, or other source, and determining whether further action is warranted.
- c) Reviewing, approving, submitting to NERC and tracking the progress of all mitigation plans /mitigating activities associated with confirmed violations or noncompliances.
- d) Coordinating settlement activities once they have been initiated and submitting settlement agreements to NERC for approval.
- d) Identifying and processing applicable moderate violations for the FFT Process.
- e) Administer both the compliance exception process and the self-logging process for identified minimal noncompliances.
- f) Coordinating the identification of possible NERC Reliability Standards revisions and submit issue for proper implementation. Revisions will be based on experiences observed from compliance monitoring activities, enforcement investigations, and event analysis. Work closely with NPCC Reliability Standards Program Area.
- g) Following up on verifying that proposed Reliability Standards have been implemented and are effective in improving the standards.
- h) Participating in the Hearing Process by representing NPCC before the Hearing Body. Compliance Hearings would be conducted at NPCC under the supervision of a qualified, independent hearing officer contracted by NPCC.
- i) Issuing Remedial Action Directives when appropriate.
- j) Implementing the risk-based compliance enforcement model including: notifying the registered entity, within 60 days on average, whether a non-compliance will proceed through enforcement, be treated as a compliance exception or additional information is needed (“Triage”).
- k) Developing and monitoring a set of enforcement metrics that support NERC’s Strategic Plan and Oversight Program.
- l) Processing violations based on the individual executed MOUs or Agreements in the Canadian Provinces of Ontario, Québec, New Brunswick and Nova Scotia.

2018 Key Assumptions and Cost Impacts

2017	Projected 2018
8 On-Site Audits	4 On-Site O&P Audits
12 On-Site CIP Audits	10 On-Site CIP Audits
32 Off-Site Audits	30 Off-Site O&P Audits
11 Off-Site CIP Audits	15 Off-Site CIP Audits
15 Spot Checks	15 Spot Checks
25 Guided self-certifications	25 Guided self-certifications
50 Inherent Risk Assessments	50 Inherent Risk Assessments
10 On-site Internal Control Evaluations	4 On-site O&P Internal Control Evaluations
	5 On-Site CIP Internal Control Evaluations
100 Violations (Estimated)	120 Violations (Estimated)
Settlements Covering 50 Violations	Settlements Covering 50 Violations
2 Hearings (Unbudgeted)	2 Hearings (Unbudgeted)
1 CI (Estimated)	1 CI (Estimated)
2 Entity Certifications	4 Entity Certifications

- Regarding the Compliance Audit Program, Technical Feasibility Exception (TFE) reviews are conducted both on-site at the entity's facility and at the NPCC offices when possible. TFE's continue to be requested as entities replace and install new equipment/devices/components that meet the criteria set forth in Rules of Procedure Appendix 4D. Compliance estimates four on-site reviews will be performed in 2018.
- Decrease in audit costs reflects Risk Assessment activity that is the basis for entity engagement scoping. The Risk Assessment includes an assessment of an entity's Internal Controls which is used for future reduction in engagement scoping and frequency of engagements.
- Potential increases due to the newly identified role related to implementing the QCMEP in Québec and the continuing role of implementing the NB CMEP in New Brunswick.
- The 2018 Business Plan projects no significant increases in Enforcement Processing activities over the 2017 Budget.
- The 2018 Business Plan projects the need for one Compliance Investigation. These Compliance Investigations are manpower intensive for NPCC staff (requiring allocation of more resources and potentially higher than normal costs).

2018 Goals and Key Deliverables

- Conduct 2018 CMEP consistent with a risk-based registration, compliance monitoring and enforcement model, assessing IRA; conducting voluntary ICE; and expanding the use of compliance exceptions and the self-logging program for disposition of minimal violations.
 - Continue to process identified violations as effectively as possible, including the timely identification of a violation and its disposition method (e.g. compliance exceptions; FFT; etc.), and the timely issuance of appropriate notification to the registered entity and NERC.
 - Continue to implement settlement process when applicable and send proper notifications to NERC and FERC and continue to enhance the settlement process by modifying existing practices and adopting new practices to reduce the duration

- of settlement negotiations without sacrificing the rigor and quality of the negotiated settlements.
- Develop and analyze appropriate performance metrics that track settlement process duration and utilize results of analysis to further enhance process.
- Conduct necessary Hearings related to resolution of outstanding disputes regarding violations and/or sanctions. Send results of hearings to NERC and FERC.
- Identify potential issues related to NERC Reliability Standards as a result of compliance monitoring, enforcement and event analysis activities.
- Implement proposed changes to NERC Reliability Standards utilizing existing mechanisms.
- Verify effectiveness of proposed changes to reliability standards.
- Provide detailed response to NERC Annual FFT/Compliance Exception Survey.
- Implement compliance responsibilities identified in the approved Canadian MOUs.
- Annual report to NERC and Régie on NPCC implementation of QCMEP.
- Annual report to NERC and New Brunswick Electric Utility Board (NBEUB) on NPCC implementation of NB CMEP.
- Provide NPCC Regional Entity input, through participation in appropriate NERC compliance committees, on policy and implementation issues related to compliance and enforcement including the development of compliance elements for all new or revised NERC Reliability Standards.
- Provide required information to NERC on a timely basis including reporting of alleged violations and confirmed violations.
- Track the progress of report status and approve mitigation plans and mitigating activities.
- Conduct 2018 Compliance Engagement Schedule based on risk to the BES and number of registered entities and promote the ERO Risk-Based Approach initiatives by:
 - Utilizing the Audit Checklist and Auditor’s Handbook for all on-site and off-site audits.
 - Preparing an Inherent Risk Assessment for all scheduled engagements and Internal Control Assessment for all entities that volunteer for one.
- Assure that NPCC Staff is trained to conduct Entity Risk Assessment and CMEP engagements including CIP Compliance Audit training.
- Assure that NPCC staff is trained to conduct Certification of entities intending to Register as BA, RC or TOP for the first time, or Certification Reviews of changes by existing BAs, RCs or TOPs that meet the criteria requiring a Certification Review.
- Continue to implement compliance reform consistent with a risk-based approach by being an integral participant in committees and workgroups that are involved in the development of polices related to the implementation of a risk-based compliance and enforcement model.
- Continue to expand the utilization of compliance exception and self-logging, as it relates to the processing of minimal noncompliances.
- Continue collaboration with ERO Enterprise on consistent compliance monitoring and enforcement practices specifically those with higher reliability risks.
- NPCC will collaborate with NERC to promote better coordination, planning, delivery and management of training efforts across the enterprise through a unified learning management system (LMS), without adversely impacting region-specific training requirements.

-
- Continue to implement physical security outreach and cyber security outreach by visiting registered entity sites to perform an assessment of their physical security, evaluate their cyber security and supply recommendations for improvements.
 - Provide outreach to the registered entities, related to the latest status of the development and implementation of the ERO Enterprise Registration and CMEP software reporting systems and tools.
 - Work with ERO Enterprise, through NPCC participation on the NERC-led Review Panel, to propose a list of possible ROP enhancements related to the NERC-led Review Panel processes and procedures.
 - Conduct 2018 Compliance Workshops and interim information sessions for registered entities as necessary as a part of the Training and Education program area.
 - Continue to promote practices to enhance the benefits of the self-reporting of violations by the registered entity. This could include the emphasis on the benefits of a registered entity improving its internal processes used for identifying and submitting self-reports, improvement in the way Regional Entities process self-reports, and the streamlining and standardizing of the amount and type of data needed to evaluate a self-report.

Based on the portion of professional/technical staff time and other resources devoted to Compliance monitoring and enforcement and organizational registration and certification, NPCC estimates that it will expend 53% of its resources on this activity.

Resource Requirements

Personnel

- There is a decrease of one FTE in 2018 from the 2017 budget. This is the result of reprioritization during 2017.

Consultants and Contracts

- In 2018, contractor costs will continue to decrease due to the implementation of the risk-based approach. With a risk and performance based assessment of each registered entity, compliance engagements will transition to a periodicity more reflective of the risk profile of the entity such that some will result in audits which are more in-depth while others may have a reduced scope which will result in spot checks or guided self-certifications.

Fixed Assets

- Continuing development of Compliance Issues Tracking System and CMEP Data Administration Application.

Compliance Monitoring and Enforcement and Organization Registration and Certification Program

Funding sources and related expenses for the compliance enforcement and organization registration and certification section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures						
2017 Budget & Projection, and 2018 Budget						
Compliance Monitoring and Enforcement and Organization Registration and Certification						
				Variance		Variance
	2017	2017	2017 Projection	2017 Projection	2018	2018 Budget
	Budget	Projection	Over(Under)	Over(Under)	Budget	v 2017 Budget
						Over(Under)
Funding						
ERO Funding						
ERO Assessments	\$ 8,084,046	\$ 8,084,046	\$ -	\$ 7,692,569	\$ (391,477)	
Penalty Sanctions	-	-	-	41,580	41,580	
Total ERO Funding	\$ 8,084,046	\$ 8,084,046	\$ -	\$ 7,734,149	\$ (349,897)	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	-	-	-	-	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 8,084,046	\$ 8,084,046	\$ -	\$ 7,734,149	\$ (349,897)	
Expenses						
Personnel Expenses						
Salaries	\$ 2,749,908	\$ 2,667,408	\$ (82,500)	\$ 2,716,635	\$ (33,273)	
Payroll Taxes	179,504	172,004	(7,500)	171,841	(7,663)	
Benefits	519,457	506,707	(12,750)	524,801	5,344	
Retirement Costs	290,486	279,236	(11,250)	282,356	(8,130)	
Total Personnel Expenses	\$ 3,739,356	\$ 3,625,356	\$ (114,000)	\$ 3,695,634	\$ (43,722)	
Meeting Expenses						
Meetings	\$ 23,800	\$ 23,800	\$ -	\$ 9,000	\$ (14,800)	
Travel	329,500	322,750	(6,750)	289,000	(40,500)	
Conference Calls	-	-	-	-	-	
Total Meeting Expenses	\$ 353,300	\$ 346,550	\$ (6,750)	\$ 298,000	\$ (55,300)	
Operating Expenses						
Consultants & Contracts	\$ 1,274,000	\$ 1,274,000	\$ -	\$ 1,254,000	\$ (20,000)	
Office Rent	-	-	-	-	-	
Office Costs	-	-	-	-	-	
Professional Services	-	-	-	-	-	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Depreciation	-	-	-	-	-	
Total Operating Expenses	\$ 1,274,000	\$ 1,274,000	\$ -	\$ 1,254,000	\$ (20,000)	
Total Direct Expenses	\$ 5,366,656	\$ 5,245,906	\$ (120,750)	\$ 5,247,634	\$ (119,022)	
Indirect Expenses	\$ 3,282,024	\$ 3,282,024	\$ -	\$ 3,113,668	\$ (168,356)	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ 8,648,680	\$ 8,527,930	\$ (120,750)	\$ 8,361,302	\$ (287,379)	
Change in Assets	\$ (564,634)	\$ (443,884)	\$ 120,750	\$ (627,153)	\$ (62,518)	
Fixed Assets						
Depreciation	\$ -	\$ -	\$ -	\$ -	\$ -	
Computer & Software CapEx	151,000	151,000	-	40,000	(111,000)	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	(73,631)	(73,631)	-	(107,554)	(33,922)	
Inc(Dec) in Fixed Assets (C)	77,369	77,369	-	(67,554)	(144,922)	
TOTAL BUDGET (=B+C)	\$ 8,726,049	\$ 8,605,299	\$ (120,750)	\$ 8,293,748	\$ (432,301)	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (642,003)	\$ (521,253)	\$ 120,750	\$ (559,599)	\$ 82,404	

Reliability Assessment and Performance Analysis Program

Reliability Assessment and Performance Analysis Program Resources			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	5.83	5.83	0.00
Direct Expenses	\$2,106,675	\$2,145,368	\$38,692
Indirect Expenses	\$1,125,541	\$1,134,543	\$9,002
Other Non-Operating Expenses	\$0	\$0	\$0
Inc(Dec) in Fixed Assets	(\$25,251)	(\$39,190)	(\$13,939)
Total Funding Requirement	\$3,206,966	\$3,240,721	\$33,755

Program Scope and Functional Description

NPCC, through its top technical committee, the Reliability Coordinating Committee (RCC), integrates the deliverables of its Task Force's and Working Group's Reliability Assessment and Performance Analysis related activities. Consistent with the applicable NERC Reliability Standards, these efforts include:

- Reviewing the adequacy of the NPCC systems to supply load considering forecast demand, installed and planned supply and demand resources and required reserves; and,
- Assessing the impact of planned transmission and resource additions or modifications on NPCC system reliability.

Seasonal assessments of the overall NPCC resource adequacy assessments are performed and possible actions to mitigate any potential problems are identified. NPCC reviews operations and disturbances both internal and external to the Region in order to identify any lessons to be learned and recommends any necessary follow-up actions.

If appropriate, enhancements to Regional Standards or NPCC's more stringent, Regionally-specific reliability requirements are also recommended. NPCC promotes and conducts both inter-Area and inter-Regional studies to enhance reliability and operational effectiveness, and provides a forum for the discussion and coordination of operating issues within the NPCC Region and with other Regions.

2018 Key Focus Areas

In collaboration with NERC, Key Focus area activities for 2018 include:

- ✓ Integration of RAPA information systems for assessments and associated data requirements, including expanded and enhanced enterprise-wide data collection and analysis systems and capabilities for performance analyses, with a focus on independent and technically sound reliability assessments supporting delivery of high quality reports (e.g., Long-Term Reliability Assessment, short-term special assessments, probabilistic scenario assessments, and the State of Reliability Report).
- ✓ Development of assessment and performance analysis techniques as well as resource capabilities and tools, including probabilistic and scenario evaluations, which address the impacts of new technologies, changing resource or demand resource composition, and environmental related regulations or legislation; support for ERO activities to identify key reliability risks and appropriate risk control projects designed to enhance reliability or mitigate risks.

- Developing and tracking of metrics associated with Essential Reliability Services.
 - Developing of appropriately tailored analysis and overall assessment, including guidance for registered entities, of high impact, low frequency BES risks, including physical security and geomagnetic disturbance (GMD) vulnerability.
 - Providing technical resources to support up to four short-term special reliability assessments (6-18 month horizon replacing the current summer and winter assessments), which focus on specific reliability issue risk areas and geographic areas with specific reliability concerns, while also allowing for regional assessments.
 - Supporting the common approach developed for NERC reliability assessments to ensure consistent treatment of resource and reliability evaluations.
 - Advancing analytical capabilities for identifying and determining reliability risks and conducting various reliability assessments by:
 - Integrating the analysis and measures of the identified essential reliability services into the NERC 2018 Long-Term Reliability Assessment.
 - Requiring advanced powerflow and stability analysis tools and objective expert input for transmission/deliverability assessments and studies.
 - Maturing and developing interconnection-wide analysis groups to support the assessment of interconnection-wide risks, such as frequency response.
 - Providing technical resources and reliability leadership for the advancement of probabilistic analyses supporting the Long-Term Reliability Assessment.
 - Enhancing the capability for post event analysis, including ensuring the timely and accurate compilation and creation of steady state and dynamic simulation model cases for use in the investigation and analysis of major power system disturbance events.
- ✓ NPCC supports, through the Eastern Interconnection base case designee agreement, the development of long-term sustainable interconnection-wide powerflow and dynamics model cases under Reliability Standards MOD-032 and MOD-033 that exhibit the accuracy and fidelity reflecting actual BES reliability performance and dynamic conditions.
- ✓ Provision of technical resources to support the effective and continuous improvement of the models that incorporate recognition of reliability behavior of loads and generation associated with the changing resource mix.

Eastern Interconnection Reliability Assessment Group

The primary function of the Eastern Interconnection Reliability Assessment Group (ERAG) is to support reliability of the bulk-power system in the Eastern Interconnection through periodic reviews of generation and transmission expansion. These assessments are conducted by the ERAG Steering Committees. The assessment-related activities indicated for the ERAG Management and Steering Committees below, are done in support of ERO Goal 3: “*Identification and Mitigation of Significant Risks to Reliability.*”

In addition, ERAG has the responsibility to facilitate the development of the annual set of seasonal and future steady state and dynamic simulation base cases for use by the Regional Entities and other industry groups in the Eastern Interconnection. This is done through the ERAG Multi-Regional Modeling Working Group (MMWG). The base case compilation and development-related activities indicated for the ERAG Management and MMWG below are done in support of ERO Goal 3 related contributing activity to: “Develop guidelines and industry practices to maintain accurate system models that include the resources (synchronous and inverter based), load,

and controllable devices providing essential reliability services.” NPCC participates in the ERAG activities as one of the six Eastern Interconnection Regional Entities.

NPCC supports maintenance of the BESnet application and the processing of the Regional BES Exception Requests (ERs), including technical validation of the definition and exception requests periodic reviews of network changes affecting BES determinations, as well as requests for registration and certification reviews. Processing of BES Exception requests and recertification of previously approved BES Exception Requests are not expected to significantly impact resources requirements in this program area for 2018.

NPCC RAPA staff participates with the ERAG Management Committee, ERAG Steering Committee and ERAG Working Group and acts as the liaison between the ERAG MMWG and the NPCC SS-37 Working Group; activities include:

ERAG Management Committee Activities 2018 Goals and Deliverables

- ✓ Oversee the steady state and dynamic simulation base case data compilation and development.
- ✓ Oversee ERAG Multi-Regional Modeling Working Group (MMWG) changes to the dynamics base cases.
- ✓ Oversee MMWG effort to make necessary changes to the modeling of governor-turbine control systems to achieve frequency response that more closely reflects actual response during system frequency deviation events.
- ✓ Oversee the ERAG assessments of anticipated inter-Regional, inter-Balancing Authority transfer limit conditions and sensitivities. ERAG is considering different assessment approaches to enhance the way assessments are conducted to provide more industry value from the assessment results. Coordinate the effort with NERC Assessment Program staff.
- ✓ Develop ERAG Strategic Direction (i.e. anticipated new developments in MMWG process and system assessments); Resolve any issues with application of the ERAG MMWG non-disclosure agreement process so that base cases and assessments have sufficient protections in place for use and transmittal of confidential data and information.
- ✓ Develop and approve the ERAG activity budgets.

Multi-Regional Modeling Working Group 2018 Goals and Deliverables

- ✓ Facilitate the completion of the steady state and dynamic simulation base case data compilation and development for the 2018 series of cases. This will include 12 steady state base cases and 8 dynamic simulation base cases.
- ✓ Check and confirm that the dynamic model data passes all applicable checks and acceptance criteria. Include 60 second steady state simulation of each case to detect numerical errors.
- ✓ Apply changes to the MMWG dynamics case so they are available for interconnection dynamics studies.
- ✓ Incorporate dispatch information into the future and seasonal ERAG MMWG base cases so that the dispatches are more closely aligned with economic dispatch practices.
- ✓ Apply the web-based System Dynamics Data Base program during the development of the 2018 series of dynamics base cases.
- ✓ Continue to improve the representations of the governor-turbine plant control models at most generators. Recommend the necessary changes in the models for specific generators.
- ✓ Apply MMWG base case non-disclosure agreement process so that MMWG cases continue to have sufficient protections in place for use and transmittal of confidential data and information.
- ✓ Verify that procedures in the MMWG manual are followed.

ERAG System Assessments 2018 Goals and Deliverables

- ✓ Conduct the 2018 ERAG Assessments and prepare the ERAG Assessment Reports, including, the assessments of anticipated inter-Regional, inter-Balancing Authority transfer limit conditions and sensitivities.
- ✓ Consider different assessment approaches to enhance the way assessments are conducted.
- ✓ Coordinate Assessment efforts with the NERC Reliability Assessment and System Analysis (RASA) Program staff to incorporate any risk-based or other approaches to supplement NERC Assessments.

2018 NERC Activities

NPCC will provide the Regional perspective with judicious NPCC RAPA staff participation on selective NERC Planning and Operating Committees and key related NERC Subcommittees, Task Forces and Working Groups which include:

- ✓ Essential Reliability Services Working Group (ERSWG);
- ✓ Load Modeling Task Force (LMTF);
- ✓ Protection System Misoperations Task Force (PSMTF);
- ✓ Demand Response Availability Data System Working Group (DADSWG);
- ✓ Generating Availability Data System Working Group (GADSWG);
- ✓ Transmission Availability Data System Working Group (TADSWG);
- ✓ Power Plant Model Verification Task Force (PPMVTF);
- ✓ Reliability Assessment Subcommittee (RAS);
- ✓ Probabilistic Assessment Working Group (PAWG);
- ✓ System Analysis and Modeling Subcommittee (SAMS);
- ✓ Performance Analysis Subcommittee (PAS);
- ✓ Misoperation Information Data Analysis System (MIDAS); and,
- ✓ Incorporating any probabilistic reliability metrics required for the 2018 NERC Long-Term Reliability Assessment through the NPCC 2018 Long Range Adequacy Overview.

ERO – Executive Management Group (EMG) 2018 Activities

Provide analytic support for the ERO-EMG:

- ✓ Bulk Electric System Exception Process Working Group (BEPWG);
- ✓ ERO-RAPA Group; and,
- ✓ Other activities as directed by the ERO-Executive Management Group.

2018 Goals and Key Deliverables

Task Force on Coordination of Planning

The primary mission of the NPCC Task Force on Coordination of Planning (TFCP) is to promote reliability through the coordination of NPCC Area and NERC planning processes and activities. In addition, the TFCP provides technical support regarding operating expertise to the NPCC Regional Standards Committee and the NPCC Compliance Committee as requested, and provides support and technical input for related BES risks identified by the NERC Reliability Issues Steering Committee (RISC) and the NERC Essential Reliability Services Working Group.

The Task Force on Coordination of Planning activities indicated below are done in support of ERO Goal No. 3 “*Identification and Assessment of Significant Risks to Reliability*” and ERO Goal No. 4 “*Identification and Assessment of Emerging Risks to Reliability*.” A related contributing activity to ERO Goal No. 3 is to “Develop advanced and probabilistic methods to evaluate resource adequacy.” Related contributing activities associated with ERO Goal No. 4 include “Enhance reliability assessments to reflect changing resource mix behavior, including

distributed energy resources and essential reliability services, using probabilistic approaches that consider the variable and energy-limited nature of the evolving resource mix,” and “Assess risks associated with cross sector dependencies and single points of disruptions.”

TFCP Reliability Assessment and Performance Analysis 2018 Goals and Deliverables

- Coordinate NPCC responses to NERC Essential Reliability Services Working Group recommendations with the Task Force on Coordination of Operation and the Task Force on System Studies to ensure that developments in the NERC Planning Committee and its Subcommittees are addressed.
- Coordinate the development of additional Criteria as necessary, and track any new and developing standards through the Regional Standards Committee.
- Monitor the development of Bulk Power System (BPS) Regional Standard.
- Oversee NPCC Directory No. 1 Implementation Plan (Dated: September 30, 2015).
- Through the CP-8 Working Group:
 - Conduct the annual NPCC Long Range Adequacy Overview and associated NERC RAS requested scenarios and/or special probabilistic studies/assessments.
 - Conduct a review of NPCC Interconnection Assistance Reliability Benefits.
- Evaluate and approve NPCC Area Transmission Reviews.
- Evaluate and approve NPCC Area reviews of Resource Adequacy.
- Coordinate, monitor, review, and make recommendations on the retirement of existing in-service Special Protection Systems (SPS) Remedial Action Schemes (RAS); and the implementation of proposed new or modified SPS/RAS.
- Monitor industry practices and make recommendations to NPCC on transmission adequacy standards related to intermittent generation such as wind or solar-photovoltaic and demand-side resources.
- Lead the NPCC Task Forces in the completion of the review and revision the *A10 Criteria– NPCC Classification of Bulk Power System Elements*.
- Support related reliability activities, including consideration of any requests for sub-regional assessments or NPCC’s identification of the necessity for such assessments consistent with NERC Rules of Procedure section 805, associated with implementation of the State related resource/environmental initiatives.
- Monitor the actions of applicable NERC Subcommittees in the areas of resource adequacy, system protection and system control.
- Through the CP-8 working Group, review the load shape assumption used in NPCC Multi-Area Probabilistic Reliability Assessments.
- Review and comment on the development of NERC Standards through the RSC.
- Monitor the developments in fuel supply, demand resources, energy efficiency, and conservation methods including all intermittent renewable resources, including embedded distributed resources.
- Support the NPCC Regional Standards Committee (RSC) as required.
- Keep informed on studies and developments with neighboring systems which might impact NPCC.
- Monitor the process for the annual review and updating of the NPCC Electric System Regional Map and the NPCC Load, Capacity, Energy, Fuel and Transmission Report (LCEF&T).
- Keep informed of the NERC Planning Committee and other subcommittee activities to determine their impact on the NPCC and any potential adjustments to NPCC Criteria.
- Coordinate with NERC regarding the development of standards for dynamic system controls.

- Review Events Analysis Lessons Learned using the Events Analysis discussion/review template.

Task Force on System Studies

The primary mission of the NPCC Task Force on System Studies (TFSS) is to provide active overall coordination of system studies of the reliability of the interconnected bulk power systems and for the review of certain NPCC documents. In addition, the TFSS provides technical support regarding operating expertise to the NPCC Regional Standards Committee and the NPCC Compliance Committee, and provides support and technical input for related BES risks identified by the NERC Reliability Issues Steering Committee (RISC) and the NERC Essential Reliability Services Working Group.

The Task Force on System Studies activities indicated below are done in support of ERO Goal No. 3 “*Identification and Assessment of Significant Risks to Reliability*” and ERO Goal No. 4 “*Identification and Assessment of Emerging Risks to Reliability*.” A related contributing activity to ERO Goal No. 3 is to “Develop guidelines and industry practices to maintain accurate system models that include the resources (synchronous and inverter based), load, and controllable devices providing essential reliability services.” A related contributing activity to ERO Goal No. 4 is to “Develop sufficiency/adequacy guidelines for essential reliability services, including considerations of reliability attributes under a more diverse resource mix and changing load behaviors, such as ramping, reserve services and voltage support.”

TFSS Reliability Assessment and Performance Analysis 2018 Goals and Deliverables

- ✓ Review and recommend approval of Area Transmission Reviews, in accordance with the “Guidelines and Procedures for NPCC Area Transmission Reviews” (Appendix B of Directory No. 1), based on material presented by the Areas. These reviews assess the impact of planned transmission and resource additions or modifications on system reliability, and determine the Area’s conformance with the Basic Criteria. Through the Area Transmission Reviews, re-evaluate the performance and classification of existing SPSs and Dynamic Control Systems.
- ✓ Review and classify new and modified Special Protection Systems and/or Remedial Action Schemes, in accordance with the Appendix B, Procedure for the Review of a Special Protection Systems, of NPCC Directory No. 7, “*Special Protection Systems*”.
- ✓ Review and Implement the NPCC A-10 Criteria:
 - Coordinate with TFCP to complete the review and revision of the A-10 document.
 - Review and recommend approval of changes to the NPCC list of bulk power system elements, in accordance with the “*Classification of Bulk Power System Elements*” (Document A-10).
 - Update the NPCC BPS List.
- ✓ Review and process Multiple Circuit Tower exclusions in accordance with NPCC Directory No. 1, Appendix E.
- ✓ Update the Multiple Circuit Tower Exclusion List.
- ✓ Perform annual review and update of the Major Project List.
- ✓ Through the SS-37 Working Group:
 - Annually develop a library of power flow base cases and associated dynamic cases. The NPCC cases will also be used to support the development of the library of power flow and dynamic cases for the Eastern Interconnection; in addition: update SS-37 Procedure Manual and other SS-37 documents including the Master Tie Line Data and Interchange Schedule.
 - Provide mid-term updates to the ten-year-out cases in the NPCC Library.

- Perform event replication by benchmarking simulations against actual system performance.
- ✓ Perform the NPCC Under Frequency Load Shedding Assessment.
- ✓ Through the SS-38 Working Group:
 - Consider the development of a uniform approach, as requested by TFSP, for identifying BES Elements that meet one or more of the Criteria in R1 of PRC-026-1.
 - Continue to instigate the use of dynamic load models for transient stability studies.
 - Work with the NERC Load Modeling Task Force to ensure consistency in load modeling and to share best practices.
- ✓ Participate in the development and submission of NPCC comments/inputs into the development of regional and/or continent-wide reliability standards that address the NERC Reliability Standards.
- ✓ Provide support and technical input, for Task Force related BES risks as identified by the NERC Reliability Issues Steering Committee (RISC).
- ✓ Review existing Regional Criteria and procedures for validation of data used in power flow and dynamic simulations and if the existing criteria or procedures are found to be deficient, propose changes to provide for adequate data validation.
- ✓ Through the SS-38 Working Group:
 - Coordinate management of governor models used in NPCC studies.
 - Support the performance of event replication by benchmarking against actual system performance.
 - Review and develop comment on draft NERC standards.
 - Work with software vendors and NERC’s systems Analysis and Modeling subcommittee (SAMS) to enhance the capability for dynamic simulations.

Task Force on System Protection

The purpose of the NPCC Task Force on System Protection (TFSP) is to promote the reliable and efficient operation of the interconnected bulk power systems in Northeastern North America through the establishment of directories, criteria, guidelines, and procedures and coordination of design, relative to the protection associated with the bulk power systems. In addition, the TFSP provides technical support regarding operating expertise to the NPCC Regional Standards Committee and the NPCC Compliance Committee, and provides support and technical input for related BES risks identified by the NERC Reliability Issues Steering Committee (RISC) and the NERC Essential Reliability Services Working Group.

The Task Force on System Protection activities indicated below are done in support of ERO Goal No. 3 “*Identification and Assessment of Significant Risks to Reliability*” and ERO Goal No. 4 “*Identification and Assessment of Emerging Risks to Reliability*.” A related contributing activity to ERO Goal No. 3 is to “Engage industry, forums, and technical committees in identifying and mitigating risks, including reducing misoperations, AC equipment failures, vegetation-related outages, and improving cold weather preparedness and human performance.” A related contributing activity to ERO Goal No. 4 is to “Evaluate the reliability impacts of distributed energy resources on planning, operations and restoration and recovery, including the identification of data and information sharing needs.”

TFSP Reliability Assessment and Performance Analysis 2018 Goals and Deliverables

- ✓ Assess proposed protection systems and special protection systems for compliance with Directory No. 4 and Directory No. 7.

- ✓ Participate or serve as lead Task Force in the implementation of applicable Regional NERC Reliability Standards.
- ✓ Review and respond to Questions, Requests for Interpretations and/or Clarifications related to bulk power system protection requirements in NPCC Directories and Criteria, as needed.
- ✓ Through the SP-7 Working Group, review misoperations of protection systems and Remedial Action Schemes/Special Protection Systems as they occur in the NPCC Region and participate in providing the NPCC input for the NERC Section 1600 Data Request.
- ✓ Review mitigations and/or progress reports for BPS Risk Reduction Implementation at each meeting and annually report to the RCC on the status of this implementation.
- ✓ Provide support and technical input for Task Force related BES risks as identified by the NERC Reliability Issues Steering Committee (RISC). Conduct a thorough review, provide comments as necessary and act on posted materials as directed. Task Force assessments and recommendations will be forwarded to the RCC for approval and submittal to NERC via NPCC Staff and the NERC Risk Control Process.
- ✓ Conduct review/development of the following Documents:
 - Directory No. 7 – “*NPCC Special Protection Systems*.” Serve as the lead Task Force working in conjunction with the TFCP and the TFSS on revisions to ensure consistency with the development of the PRC-01202 NERC standard on Remedial Action Schemes.
 - Through the SP-9 Working Group on Telecommunication Circuits Used for Teleprotection and Remedial Action Schemes, develop a new guideline for teleprotection communication reliability.
- ✓ Participate in the ongoing development and submission of NPCC inputs/comments into the development of bulk electric system protection related NERC Reliability Standards.
- ✓ Through the SP-7 Working Group, maintain ongoing log of protection relay failures. Coordinate improved data gathering of relay failures among equipment owners, manufacturers, and vendors.
- ✓ Review and analyze the performance of protection systems of power system disturbances, lessons learned, and events inside as well as outside NPCC as brought to the attention of TFSP by the SP-7 Working Group, NERC Event Analysis Coordinating Group or as requested by the RCC. Issue recommendations for changes to NPCC Documents and lessons learned, as appropriate.
- ✓ Support NERC’s effort through the ERO-RAPA group to continue relay misoperations performance analysis to reduce protection system misoperations and inform the RCC on relay misoperations trends, and share good practices.
- ✓ Consistent with the TFSP’s scope, conduct joint meeting with other Regions to share best practices and experiences.

Task Force on Coordination of Operation

The NPCC Task Force on Coordination of Operation (TFCO) facilitates the coordination of operations among the NPCC Reliability Coordinator areas and adjacent NERC Regions to enhance the reliability of the bulk power system. In addition, the TFCO provides technical support regarding operating expertise to the NPCC Regional Standards Committee and the NPCC Compliance Committee, and provides support and technical input for related BES risks identified by the NERC Reliability Issues Steering Committee (RISC) and the NERC Essential Reliability Services Working Group.

The Task Force on Coordination of Operation activities indicated below are done in support of ERO Goal No. 3 “*Identification and Assessment of Significant Risks to Reliability*” and ERO

Goal No. 4 “*Identification and Assessment of Emerging Risks to Reliability.*” Related contributing activities related to ERO Goal No.3 include “Conduct assessments of system resiliency and develop guidance for operations in a more secure state;” and ERO Goal No.4 “Evaluate the reliability impacts of distributed energy resources on planning, operations and restoration and recovery, including the identification of data and information sharing needs.”

TFCO Reliability Assessment and Performance Analysis 2018 Goals and Deliverables

- ✓ Prepare and conduct the spring and autumn NPCC System Operator Seminars. Provide recommendations to enhance the programs.
- ✓ Develop and securely disseminate the annual compilation of “Facilities for Notification”.
- ✓ Support and take part in a biennial, continent-wide Grid Security Exercise (GridEx), including a review of the associated reports and Lessons Learned.
- ✓ Support an annual enhanced, wide area restoration drill among the Reliability Coordinator areas of NPCC and their neighboring Reliability Coordinators incorporating the annual review of the NPCC regional restoration plan.
- ✓ Conduct pre-seasonal NPCC Reliability Assessments incorporating multi-area probabilistic reliability simulation results in each assessment. Coordinate the NPCC input for the annual data for seasonal short-term NERC Reliability Assessments.
- ✓ Conduct reviews of applicable NPCC Directories, Criteria, Guides and Procedures in accordance with their applicable review dates.
- ✓ Coordinate system awareness among NPCC RCs through periodic conference calls. This includes the existing emergency preparedness, NPCC weekly and daily system operator conference calls.
- ✓ Monitor the trends and impacts of the changing resource mix and the effects of the proliferation of the new resources on real-time operations, particularly the measures identified in the Essential Reliability Services Framework Report, as well as behavior during and impacts on recovery and restoration plans including consideration of distributed resources, considering the variable and energy-limited nature of the resource shifts. Review a biennial summary of operating tool failures and lessons learned for the preceding study period.
- ✓ Provide assistance to the NERC Event Analysis process (EAP). Evaluate the operational applicability of Lessons Learned from the NERC EAP.
- ✓ Keep informed of the NERC Operating Committee and other subcommittee activities to determine their impact on the NPCC and any potential adjustments to Criteria, as well as provide feedback and input to the respective committees.
- ✓ Review and analyze the performance of Simultaneous Activation of Reserve (SAR) implementation following an event to enhance the SAR process.
- ✓ Share lessons learned among training staff from the NPCC RCs and utilize to make training program enhancements.

NPCC Regulatory/Governmental Affairs Advisory Group

The purpose of the NPCC Regulatory/Governmental Affairs Advisory Group is to promote NPCC interaction and coordination with Federal/State/Provincial governmental and/or regulatory agencies on a coordinated Regional basis, and identify and develop policy input for NPCC and Northeast Regional governmental and/or regulatory bodies.

The NPCC Governmental/Regulatory Affairs Advisory Group provides a forum where industry and governmental and/or regulatory representatives can exchange views and strive to develop consensus policy recommendations on reliability issues specific to the NPCC Region (Northeastern United States and Eastern Canada) and share actionable information among

NPCC, NERC and other related governmental and/or regulatory agencies related to Regional energy and reliability matters.

The Regulatory/Governmental Affairs Advisory Group activities indicated below are done in support of ERO Goal No. 4 “Identification and Assessment of Emerging Risks to Reliability.” A related contributing activity to this Goal is to “Educate policy makers, regulators, and the industry of reliability effects and interconnection requirements for the changing resource mix.”

NPCC Regulatory/Governmental Affairs Advisory Group 2018 Goals and Deliverables

- ✓ Continued outreach to NPCC’s state electricity and environmental regulators stressing the importance of understanding and considering reliability impacts during the development of State/Provincial initiatives (such as the identified Essential Reliability Services). This includes focus on initiatives concerning regional planning, distributed energy resource requirements, the timing of new generation resources and transmission infrastructure projects.

Based on the portion of professional/technical staff time and other resources devoted to Reliability Assessment and Performance Analysis, NPCC estimates that it will expend 22% of its resources on these activities.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Consultants and Contracts

- Increase in consultants and contracts expense is associated with an anticipated increase in inherent risk and emerging risk reliability studies.

Reliability Assessment and Performance Analysis Program

Funding sources and related expenses for the Reliability Assessment and Performance Analysis section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures						
2017 Budget & Projection, and 2018 Budget						
Reliability Assessment and Performance Analysis						
	2017	2017	Variance	2018	Variance	
	Budget	Projection	2017 Projection	Budget	2018 Budget	
			v 2017 Budget		v 2017 Budget	
			Over(Under)		Over(Under)	
Funding						
ERO Funding						
ERO Assessments	\$ 3,206,966	\$ 3,206,966	\$ -	\$ 3,225,570	\$ 18,604	
Penalty Sanctions	-	-	-	15,151	15,151	
Total ERO Funding	\$ 3,206,966	\$ 3,206,966	\$ -	\$ 3,240,721	\$ 33,755	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	-	-	-	-	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 3,206,966	\$ 3,206,966	\$ -	\$ 3,240,721	\$ 33,755	
Expenses						
Personnel Expenses						
Salaries	\$ 1,084,994	\$ 1,084,994	\$ -	\$ 1,106,772	\$ 21,778	
Payroll Taxes	65,373	65,373	-	65,805	432	
Benefits	214,688	214,688	-	220,007	5,319	
Retirement Costs	121,271	121,271	-	117,144	(4,127)	
Total Personnel Expenses	\$ 1,486,325	\$ 1,486,325	\$ -	\$ 1,509,728	\$ 23,402	
Meeting Expenses						
Meetings	\$ 20,500	\$ 20,500	\$ -	\$ 22,000	\$ 1,500	
Travel	186,850	186,850	-	212,000	25,150	
Conference Calls	-	-	-	-	-	
Total Meeting Expenses	\$ 207,350	\$ 207,350	\$ -	\$ 234,000	\$ 26,650	
Operating Expenses						
Consultants & Contracts	\$ 413,000	\$ 413,000	\$ -	\$ 401,640	\$ (11,360)	
Office Rent	-	-	-	-	-	
Office Costs	-	-	-	-	-	
Professional Services	-	-	-	-	-	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Depreciation	-	-	-	-	-	
Total Operating Expenses	\$ 413,000	\$ 413,000	\$ -	\$ 401,640	\$ (11,360)	
Total Direct Expenses	\$ 2,106,675	\$ 2,106,675	\$ -	\$ 2,145,368	\$ 38,692	
Indirect Expenses	\$ 1,125,541	\$ 1,125,541	\$ -	\$ 1,134,543	\$ 9,002	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ 3,232,217	\$ 3,232,217	\$ -	\$ 3,279,911	\$ 47,694	
Change in Assets	\$ (25,251)	\$ (25,251)	\$ -	\$ (39,190)	\$ (13,939)	
Fixed Assets						
Depreciation	\$ -	-	\$ -	\$ -	\$ -	
Computer & Software CapEx	-	-	-	-	-	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	(25,251)	(25,251)	-	(39,190)	(13,939)	
Inc(Dec) in Fixed Assets (C)	(25,251)	(25,251)	-	(39,190)	(13,939)	
TOTAL BUDGET (=B+C)	3,206,966	3,206,966	-	3,240,721	33,755	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ 0	\$ 0	\$ -	\$ 0	\$ (0)	

Training, Education, and Operator Certification Program

Training, Education, and Operator Certification Program Resources			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	0.10	0.10	0.00
Direct Expenses	\$229,785	\$230,263	\$477
Indirect Expenses	\$19,306	\$19,460	\$154
Other Non-Operating Expenses	\$0	\$0	\$0
Inc(Dec) in Fixed Assets	(\$433)	(\$672)	(\$239)
Total Funding Requirement	\$248,658	\$249,051	\$393

Program Scope and Functional Description

The NPCC Training, Education, and Operator Certification program supports NERC Rules of Procedure Section 900. The program provides education and training necessary to understand and operate the bulk electric system. The target audience of the program is bulk power system operating personnel - including system operations personnel, operations support personnel (engineering and information technology), supervisors and managers, and training personnel. NPCC staff training and development is incorporated within each respective program area.

Training Program Background and Description

This NPCC Program establishes and coordinates training for system operators relating to inter-Reliability Coordinator area matters, criteria, terminology, standards and operating procedures and instructions. It includes development and execution of training seminars, held twice yearly, at which: 1) potential operational problems for the coming season are discussed, 2) application of NPCC Directory and NERC Standard requirements pertinent to operation are discussed, 3) major industry issues that are important for system operators are discussed, 4) significant disturbances are reviewed for lessons learned and 5) table-top drills and communication and coordination exercises are conducted. The seminars promote camaraderie and better communication among system operators from the NPCC Reliability Coordinator (RC) areas and the Nova Scotia Balancing Authority (BA) area.

This Program also provides for: 1) sharing of RC/BA existing training program and system simulator area content; 2) training techniques and methods; 3) evaluation of new techniques and training and simulator aids as they become available; 4) opportunities to consolidate training among the NPCC RCs and BAs, which includes opportunities to share training material and training sessions; and 5) exchange of information on internal methods of system operator training.

The training activities indicated below are done in support of ERO Goal No. 5 “Effective and Efficient ERO Enterprise Operations.” A related contributing activity to this goal is to “Acquire, engage, develop, and retain highly qualified talent with requisite technical expertise to execute the ERO Enterprise’s statutory functions.”

Funding Drivers and Reliability Benefits

- Provide two high-quality continuing education seminars for system operators;
 - System operators participating in the Seminars: 1) share their approaches to solving operational problems and learn about the characteristics of neighboring systems; 2) gain exposure to NPCC issues and current industry operational topics; 3) review recent NPCC and major external disturbances; 4) review key operational related content in NPCC Directories and NERC Standards; and 5) participate in hands-on “table top exercises” pertaining to system operational practices. PJM system operators and trainers are also invited to participate and normally attend these seminars;
 - Seminar attendees also receive Continuing Education Hours (CEHs) (normally 3.5 to 4 CEHs) and operator trainers from each RC / BA area can utilize the seminar content by including it in their internal training programs to provide CEHs to all system operators; and,
 - The seminars help to improve system operational coordination through better contact among system operators at other Reliability Coordinator areas.
- Continually review and revise the curriculum of the training seminars to better emphasize NERC Standard requirements related to system operation, NPCC wide-area operations and Regionally-specific criteria and procedures.
- Enhance the system operator’s awareness and knowledge of the standards, criteria and procedures they apply in real time operation.
- Provide more sharing of new training approaches, exchange of information on internal methods of system operator selection, training material and training sessions:
 - Enhance efficiency and cost savings in the training programs in the NPCC RC / BA areas.
- Provide a forum among NPCC RC/BA areas for sharing of approaches to meet the requirements of the NERC PER standards. The sharing of approaches used by some NPCC Areas to address any changes needed to existing system operator training programs due to PER-005-2 requirements is valuable to CO-2 Working Group members.
- Implement changes needed for the NPCC Reliability Coordinator / Balancing Authority Areas to meet proposed expanded training requirement for operations support staff in PER-005-2.
- NPCC will conduct two Standards and Compliance workshops in 2018, for NPCC Stakeholders, for the express purpose of providing the most current and applicable information related to the development of NERC and Regional Reliability Standards and the implementation of the Compliance Monitoring and Enforcement Program (CMEP).

2018 Key Assumptions

NPCC regularly conducts seminars as well as Spring and Fall Standards and Compliance workshops specifically designed, primarily through the conduct of targeted breakout class room sessions and presentations on current industry related activities, to provide for the most efficient exchange of information between the NPCC Compliance and Standards staff and the NPCC Stakeholders. Presentations in the past have been conducted by FERC, NERC and Stakeholder representatives in addition to NPCC staff members. To supplement these workshops, NPCC is considering developing on-line webinars that will focus on a specific topic pertinent to developments related to compliance program implementation, standards development or technical issues.

NPCC also regularly conducts Spring and Fall System Operator Seminars. These seminars involve system operators from the NPCC RC/BA Areas and PJM, and are held in early May and early November.

Training, Education and Operator Certification 2018 Goals and Deliverables

- Prepare and conduct the 2018 Spring and Fall NPCC System Operator Seminars.
- Implement the PER-005-2 expanded requirements within the NPCC RC/BA Area programs.
- Continue collaboration and sharing of the intended RC/BA approaches, experiences and materials to task identification and training development associated with NERC Standard PER-005-2.
- As needed, expand the NPCC repository of training resources and learning verification activities addressing fundamental power system topics, training methods and operation procedure training exercises, which may be shared as elements of operator training in compliance with NERC Standard PER-005, “*System Personnel Training*”.
- Develop on-line operational training webinars that focus on specific topics pertinent to compliance program implementation, standards development or technical issues.

Based on the portion of professional/technical staff time and other resources devoted to training, education, and operator certification, NPCC estimates that it will expend 2% of its resources on this activity.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Training, Education, and Operator Certification Program

Funding sources and related expenses for the training, education, and operator certification section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures						
2017 Budget & Projection, and 2018 Budget						
Training, Education, and Operator Certification						
	2017	2017	Variance	2018	Variance	
	Budget	Projection	2017 Projection	Budget	2018 Budget	
			v 2017 Budget		v 2017 Budget	
			Over(Under)		Over(Under)	
Funding						
ERO Funding						
ERO Assessments	\$ 184,658	\$ 184,658	\$ -	\$ 184,791	\$ 133	
Penalty Sanctions	-	-	-	260	260	
Total ERO Funding	\$ 184,658	\$ 184,658	\$ -	\$ 185,051	\$ 393	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	64,000	64,000	-	64,000	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 248,658	\$ 248,658	\$ -	\$ 249,051	\$ 393	
Expenses						
Personnel Expenses						
Salaries	\$ 21,012	\$ 21,012	\$ -	\$ 18,399	\$ (2,613)	
Payroll Taxes	1,396	1,396	-	1,350	(46)	
Benefits	4,801	4,801	-	4,893	92	
Retirement Costs	2,641	2,641	-	2,320	(321)	
Total Personnel Expenses	\$ 29,850	\$ 29,850	\$ -	\$ 26,963	\$ (2,888)	
Meeting Expenses						
Meetings	\$ 186,300	\$ 186,300	\$ -	\$ 188,300	\$ 2,000	
Travel	13,635	13,635	-	15,000	1,365	
Conference Calls	-	-	-	-	-	
Total Meeting Expenses	\$ 199,935	\$ 199,935	\$ -	\$ 203,300	\$ 3,365	
Operating Expenses						
Consultants & Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	
Office Rent	-	-	-	-	-	
Office Costs	-	-	-	-	-	
Professional Services	-	-	-	-	-	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Depreciation	-	-	-	-	-	
Total Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Direct Expenses	\$ 229,785	\$ 229,785	\$ -	\$ 230,263	\$ 477	
Indirect Expenses	\$ 19,306	\$ 19,306	\$ -	\$ 19,460	\$ 154	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ 249,091	\$ 249,091	\$ -	\$ 249,723	\$ 632	
Change in Assets	\$ (433)	\$ (433)	\$ -	\$ (672)	\$ (239)	
Fixed Assets						
Depreciation	\$ -	-	\$ -	\$ -	\$ -	
Computer & Software CapEx	-	-	-	-	-	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	(433)	(433)	-	(672)	(239)	
Inc(Dec) in Fixed Assets (C)	(433)	(433)	-	(672)	(239)	
TOTAL BUDGET (=B+C)	248,658	248,658	-	249,051	393	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (0)	\$ (0)	\$ -	\$ 0	\$ 0	

Situation Awareness and Infrastructure Security Program

Situation Awareness and Infrastructure Security Program Resources			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	4.00	5.00	1.00
Direct Expenses	\$1,188,137	\$1,373,791	\$185,654
Indirect Expenses	\$772,241	\$973,021	\$200,780
Other Non-Operating Expenses	\$0	\$0	\$0
Inc(Dec) in Fixed Assets	(\$17,325)	(\$33,611)	(\$16,286)
Total Funding Requirement	\$1,943,053	\$2,313,202	\$370,148

Program Scope and Functional Description

The Situation Awareness and Infrastructure Security Program is the combination of near real time awareness of conditions on the bulk power system with the programs necessary to increase the physical and cyber security of the electricity infrastructure, including the operation and maintenance of tools and other support services for the benefit of Reliability Coordinators and the system operators within the registered entities. Maintaining the real-time awareness of conditions on the interconnected bulk power systems by the NPCC Reliability Coordinator is critical to maintaining reliable operation within NPCC, including the communication of information concerning system conditions and abnormal events among the neighboring system operators responsible for the reliable operation of the bulk power systems. When a disturbance does occur, it is critical to use the event as a learning opportunity and provide a forum for the active coordination of reliability and operation among the NPCC Reliability Coordinator areas and neighboring NERC Regions to enhance the reliability of the interconnected bulk power system through the lessons to be learned which can be gleaned from such an event.

These Situation Awareness and Infrastructure Security activities indicated below are done in support of ERO Goal No. 3 “*Identification and Mitigation of Significant Risks to Reliability.*” A related contributing activity to this Goal is to “Analyze system performance, events, and relationships among data sources to identify risks and mitigation strategies, and provide recommendations and lessons learned.”

Event Analysis Program Description

NERC and the industry follow three avenues in the analysis of a disturbance: the identification of lessons to be learned, a formal cause code analysis and a review of applicable standards.

The Event Analysis Program recognizes that many events which occur on the bulk power system beyond those identified through NERC Reliability Standard EOP-004-2, “Event Reporting,” can have varying levels of significance to the electric system, providing otherwise unrealized lessons to be learned from these events and the trending of such events to identify possible reliability concerns. By integrating a “bottom-up” approach to a disturbance review within the framework of the NERC Event Analysis Program, consistency, comparability, flexibility and timeliness in the event analysis process will be promoted by NPCC, the registered entities and NERC in a collaborative initiative. Upon the identification of an event, the goal of the Event Analysis Program is to:

- identify what transpired;

- categorize the event within the NERC Event Analysis Program;
- establish the sequence of events;
- understand the essential root causes of the event;
- identify recommendations or corrective actions; and,
- develop and disseminate to the industry lessons to be learned so that the operational reliability of the bulk power system can be further enhanced.

In assessing any system event, it is recognized that, if the timely dissemination of lessons learned from an event or disturbance is to be realized, any potential compliance implications associated with an event must be addressed and dismissed. Throughout an event analysis effort, to make this process successful and complete, and to solidify the “bottom-up” approach, registered entities are encouraged to establish a liaison between the event analysis and compliance functions internal to the registered entity during the event analysis process. This serves to facilitate the development of a registered entity compliance self-assessment report which will perform a sufficiency review of the reliability standards deemed applicable to the event, assisting in the self-reporting of possible violations should any be discovered.

To complete this effort, the entity, the Region and NERC staff will collaborate to assess the NERC Event Analysis Report and perform a formal cause code analysis, identifying a root cause and publish any pertinent lessons learned gathered from the disturbance.

The adoption by NERC of the Event Analysis Program brings clarity and certainty about what system events are relevant to analyze and to what level of detail, targeting potential risks to the reliability of the bulk power system for detailed and in depth analysis; only concise and succinct reviews are desired for more minor events. It also delineates the expectations of roles and responsibilities of the registered entities, NPCC and NERC in a uniform review of system disturbances by the industry, and, ultimately, the program promotes the timely development and dissemination of valuable lessons learned to the industry. The identification and tracking of emerging common risks through the assessment of events will further distinguish trends which may be of concern to reliability. By rigorously pursuing the lesser events on the system and learning from these disturbances, larger events can be avoided or mitigated.

NPCC staff works step-by-step with the registered entity in the total event analysis process, permitting the entity to assume the primary role in the development of the initial analysis, lessons learned which may benefit the industry and the Standards sufficiency review and cause coding for trending and reporting. NPCC staff, throughout the process, guides, supports and stands as an advocate of the registered entity as they continue to develop an improved culture of reliability and compliance.

2018 Key Assumptions

- The monitoring of Lessons Learned will continue to be a major focus of NERC in 2018. This will include an added aspect of the voluntary Event Analysis Program, in response to a recommendation of the AC Substation Equipment Task Force (ACSETF), to solicit and collect detailed information on station equipment failures, for applicable, qualifying events to aid in future analysis of station equipment failures to identify trends that may be a threat to the reliability of the BES.
- Critical infrastructure protection will fully integrate the requirements of Version 5 of the Cyber Standards in 2018.

- NERC will post updates to the critical infrastructure protection (CIP) Standards to address the three FERC Directives and the four industry concerns that were not satisfactorily responded to by the version 5 Transition Advisory Group.
- Increase in resource allocation to this program area will support: expanded Events Analysis activities; coordination with NERC’s evolving E-ISAC capabilities; and cybersecurity outreach efforts.

Situation Awareness 2018 Goals and Deliverables

NERC Activities

- NPCC will provide the Regional perspective and support through NPCC EA staff participation on selective NERC Planning and Operating Committees and key related NERC Subcommittees, Task Forces and Working Groups, including:
 - Event Analysis Subcommittee (EAS);
 - ERO – EA/SA Group; and,
 - The Event Analysis Management System (TEAMS).

NPCC Activities

- Work directly with applicable NPCC Task Forces to provide an in-depth assessment of Lessons Learned unique to the NPCC members and NPCC Criteria.
- Promote NPCC’s Event Analysis group’s established process for sharing and dissemination of the detailed Event Analysis Report information among industry participants (registered entities).
- Incorporating the Lessons Learned from participation in the GridEx IV wide-area exercise.
- Utilize the NPCC’s “what if” methodology to examine an event’s potential impact under a different set of system conditions, to evaluate the proximity of a particular event to being a significant BPS requiring appropriate level of analysis with due weight to risk and impact.
- Establish a process/procedure for data capture and transfer aspects for post-disturbance (major disturbance and/or blackout events) system analysis, including requirements for regularly scheduled (annual) testing of the procedure implementation.
- Monitor the operational status of the bulk power system and coordinate normal and pre-emergency communication, awareness and assistance in addition to the same during an emergency among the Reliability Coordinators (RCs) within NPCC. Notify the RCs of significant bulk power system events that have occurred in one Reliability Coordinator Area, and which have the potential to impact reliability in other NPCC Reliability Coordinator Areas or Regions external to NPCC. These events include contingencies on the bulk power system, potential shortfalls of operating reserve, operating problems, potential security threats and potential threats or disruptions to the cyber systems.
- Conduct a daily conference call to serve as a complement to the NPCC Emergency Preparedness Conference Call. The participants of the call are the Reliability Coordinators within NPCC and its neighboring RCs, the Midcontinent ISO and PJM. The conference call is implemented through a bridge, the initiation of the call quickly ringing all pre-selected telephones simultaneously. The goal of the call is to alert all Reliability Coordinators of emerging problems. If no system difficulties are anticipated for the day, no unnecessary information is to be discussed. Subjects for discussion are limited to credible events which could impact the ability of an entity to serve its load and meet its operating reserve obligations or would impose a burden to the interconnection,

including the following: Projected Load; Adverse Weather; Operating Reserve; Generation; Transmission; and Sabotage. If conditions worsen in the course of the day, the NPCC Emergency Preparedness Conference Call will be implemented.

- Monthly test of the satellite telephone network, to ensure the capability for continued voice communications among NPCC and its Reliability Coordinators. This back-up communications system will function in the event of a collapse of the Public Switched Telephone Network (PSTN), permitting continued cross-border voice communications among the Canadian Reliability Coordinators of NPCC, the Reliability Coordinators in the United States as well as NPCC Situation Awareness (SA) staff.

Situation Awareness 2018 Goals and Deliverables

Monitor the status of the bulk power system through the NERC Situational Awareness-FERC, NERC, Regions (SAFNR) initiative, a near real-time operating display for the United States portion of the Reliability Coordinators footprints of North America. Transmission voltage levels of 230 kV and above are displayed, and the tool provides the ability to “drill down” to detailed bus information, including generation outputs and bus voltages.

Critical Infrastructure Objectives

NPCC’s critical infrastructure objectives are defined within the scope of the NPCC Task Force on Infrastructure Security & Technology, (TFIST) and include, but are not confined to:

- Providing a forum for NPCC review of proposed and posted documents from the NERC Critical Infrastructure Protection Committee (CIPC); and,
- Representing and advocating NPCC’s position in the activities of NERC groups involved in the development and/or implementation of physical and cyber security.

NPCC’s 2018 critical infrastructure goals and objectives, supporting ERO Goal No. 3 - *Identification and Mitigation of Significant Risks to Reliability*. Related contributing activities to this Goal include “Expand the use, availability, and value of physical security and cybersecurity threat and vulnerability information sharing, including cross sector communications, and analytics” and “In collaboration with the Critical Infrastructure Protection Committee and industry stakeholders, develop a risk process to address the potential impact of cyber and physical security threats and vulnerabilities.”

Critical Infrastructure 2018 Goals and Deliverables

- Monitor the reliable implementation of the Cyber Security Standards.
- Monitor the Homeland Security Information Network (HSIN), E- ISAC, NERC Alerts and Canadian Information Sharing and share information with the NPCC CO-8 Working Group.
- Review and submit comments on NERC proposed Reliability Standards, modified Reliability Standards, proposed Guidelines and modified Guidelines related to Infrastructure Security and Technology.
- Keep current on all governmental agencies regarding applicable security recommendations and requirements, and other applicable security and reliability recommendations and keep the RCC and its committees appropriately informed, e.g. Sector Specific Plan.
- Conduct an annual test of cross border emergency telecommunications to verify each Area can communicate with each other.

- Provide support and technical input for Task Force related BES risks as identified by the NERC Reliability Issues Steering Committee. The Task Force will conduct a thorough review, provide comments as necessary and act on posted materials as directed.
- Support the NERC CIPC Grid Exercise Working Group (GEWG) with Cross Sector support in Grid Exercise (GridEx) IV planning and simulation. Participate in the development of lessons learned from GridEx IV.
- Review infrastructure security & technologies and provide recommendations to enhance physical and cyber security in compliance with NERC guidelines/standards.
- Provide recommendations to enhance physical and cyber security, in compliance with NERC standards, based on assessments of available and emerging infrastructure security technologies, methodologies, and best practices.
- Sponsor periodic workshop presentations to address timely issues and update NPCC Members associated with infrastructure security and technology.
- Provide education, awareness, and support for Cross Sector coordination in Entity agreements and response plans with focus upon Telecommunications, Water and Natural Gas, including monitoring and sharing with the E-ISAC.

Related System Operations Security 2018 Goals and Deliverables

NPCC's system operations security objectives are defined within the scope of the NPCC Task Force on Coordination of Operation (TFCO) and include, but are not confined to:

- Coordinating inter-Regional pre-emergency actions in the event of a threat to the security of the Northeastern North American bulk power supply system; and,
- Assisting in the development of real time operating tools assuring cyber security concerns are addressed.

Based on the portion of professional/technical staff time and other resources devoted to situation awareness and infrastructure security, NPCC estimates that it will expend 16% of its resources on this activity.

Resource Requirements

Personnel

- Reallocation of staff during 2017 resulted in an increase of one full time employee in the Situation Awareness and Infrastructure Security program to support increased workload in this area.

Consultants and Contracts

- Decrease in consulting and contracts expense is associated with increase in staff allocated to this program area.

Situation Awareness and Infrastructure Security Program

Funding sources and related expenses for the situation awareness and infrastructure security section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures 2017 Budget & Projection, and 2018 Budget						
Situation Awareness and Infrastructure Security						
	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)	
Funding						
ERO Funding						
ERO Assessments	\$ 1,943,053	\$ 1,943,053	\$ -	\$ 2,300,208	\$ 357,155	
Penalty Sanctions	-	-	-	12,994	12,994	
Total ERO Funding	\$ 1,943,053	\$ 1,943,053	\$ -	\$ 2,313,202	\$ 370,148	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	-	-	-	-	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ 1,943,053	\$ 1,943,053	\$ -	\$ 2,313,202	\$ 370,148	
Expenses						
Personnel Expenses						
Salaries	\$ 660,213	\$ 742,713	\$ 82,500	\$ 825,560	\$ 165,347	
Payroll Taxes	42,778	50,278	7,500	53,677	10,899	
Benefits	160,814	173,564	12,750	189,417	28,603	
Retirement Costs	72,333	83,583	11,250	87,637	15,304	
Total Personnel Expenses	\$ 936,137	\$ 1,050,137	\$ 114,000	\$ 1,156,291	\$ 220,154	
Meeting Expenses						
Meetings	\$ 13,500	\$ 13,500	\$ -	\$ 10,000	\$ (3,500)	
Travel	78,500	85,250	6,750	87,500	9,000	
Conference Calls	-	-	-	-	-	
Total Meeting Expenses	\$ 92,000	\$ 98,750	\$ 6,750	\$ 97,500	\$ 5,500	
Operating Expenses						
Consultants & Contracts	\$ 160,000	\$ 160,000	\$ -	\$ 120,000	\$ (40,000)	
Office Rent	-	-	-	-	-	
Office Costs	-	-	-	-	-	
Professional Services	-	-	-	-	-	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Depreciation	-	-	-	-	-	
Total Operating Expenses	\$ 160,000	\$ 160,000	\$ -	\$ 120,000	\$ (40,000)	
Total Direct Expenses	\$ 1,188,137	\$ 1,188,137	\$ 120,750	\$ 1,373,791	\$ 185,654	
Indirect Expenses	\$ 772,241	\$ 772,241	\$ -	\$ 973,021	\$ 200,780	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ 1,960,378	\$ 1,960,378	\$ 120,750	\$ 2,346,812	\$ 386,434	
Change in Assets	\$ (17,325)	\$ (17,325)	\$ (120,750)	\$ (33,611)	\$ (16,286)	
Fixed Assets						
Depreciation	\$ -	-	\$ -	\$ -	\$ -	
Computer & Software CapEx	-	-	-	-	-	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	(17,325)	(17,325)	-	(33,611)	(16,286)	
Inc(Dec) in Fixed Assets (C)	(17,325)	(17,325)	-	(33,611)	(16,286)	
TOTAL BUDGET (=B+C)	1,943,053	1,943,053	120,750	2,313,202	370,148	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (0)	\$ (0)	\$ (120,750)	\$ 0	\$ 0	

Administrative Services

Administrative Services Program Resources						
(in whole dollars)						
	Direct Expenses and Fixed Assets			FTEs		
	2017 Budget	2018 Budget	Increase (Decrease)	2017 Budget	2018 Budget	Increase (Decrease)
Technical Committees and Members Forum	\$72,500	\$70,680	(\$1,820)	0.50	0.50	0.00
General and Administrative	\$3,245,691	\$3,338,132	\$92,441	2.50	2.50	0.00
Legal and Regulatory	\$648,680	\$592,049	(\$56,632)	1.00	1.00	0.00
Information Technology	\$1,185,675	\$1,119,490	(\$66,186)	2.00	2.00	0.00
Human Resources	\$182,059	\$181,145	(\$915)	1.00	1.00	0.00
Finance and Accounting	\$525,262	\$537,236	\$11,974	1.00	1.00	0.00
Total Administrative Services¹	\$5,859,868	\$5,838,732	(\$21,136)	8.00	8.00	0.00

¹ NPCC's 2018 Administrative Services budget (expenses plus fixed asset activity) is \$5,838,792, of which \$416,453 is allocated to NPCC's Criteria Services division, which is a non-statutory function. As a result of the allocation to the Criteria Services division, the Administrative Expenditures included in the 2018 statutory budget are \$5,422,278, which is a decrease of \$24,441 from the 2017 budget of \$5,446,719.

Program Scope and Functional Description

Administrative services support the previously identified five program areas of: reliability standards; compliance monitoring and enforcement and organization registration and certification; training, education, and operator certification; reliability assessment and performance analysis; and situation awareness and infrastructure security. Administrative services consist of: technical committees and members' forums; general and administrative; legal and regulatory; information technology; human resources; and finance and accounting.

Methodology for Allocation of Administrative Services Expenses to Programs

NPCC total overhead expenses, such as office rent and office costs, will be charged to the Administrative Services Programs and then reallocated proportionately based on FTE to the programs through Indirect Expenses.

Administrative Services

Funding sources and related expenses for the Administrative Services section of the 2018 business plan are shown in the table below. Explanations of variances by expense category are included with the Supplemental Tables found in Section B.

Statement of Activities and Capital Expenditures 2017 Budget & Projection, and 2018 Budget						
ADMINISTRATIVE SERVICES						
	2017 Budget	2017 Projection	Variance 2017 Projection v 2017 Budget Over(Under)	2018 Budget	Variance 2018 Budget v 2017 Budget Over(Under)	
Funding						
ERO Funding						
ERO Assessments	\$ (185,991)	\$ (185,991)	\$ -	\$ (66,581)	\$ 119,409	
Penalty Sanctions	-	-	-	-	-	
Total ERO Funding	\$ (185,991)	\$ (185,991)	\$ -	\$ (66,581)	\$ 119,409	
Membership Dues	-	-	-	-	-	
Testing Fees	-	-	-	-	-	
Services & Software	-	-	-	-	-	
Workshops	-	-	-	-	-	
Interest	-	-	-	-	-	
Miscellaneous	-	-	-	-	-	
Total Funding (A)	\$ (185,991)	\$ (185,991)	\$ -	\$ (66,581)	\$ 119,409	
Expenses						
Personnel Expenses						
Salaries	\$ 1,872,579	\$ 1,872,579	\$ -	\$ 2,063,139	\$ 190,561	
Payroll Taxes	93,995	93,995	-	97,378	3,383	
Benefits	418,433	418,433	-	438,408	19,975	
Retirement Costs	317,471	317,471	-	295,596	(21,874)	
Total Personnel Expenses	\$ 2,702,478	\$ 2,702,478	\$ -	\$ 2,894,522	\$ 192,044	
Meeting Expenses						
Meetings	\$ 120,000	\$ 120,000	\$ -	\$ 116,750	\$ (3,250)	
Travel	143,590	143,590	-	138,000	(5,590)	
Conference Calls	37,000	37,000	-	37,000	-	
Total Meeting Expenses	\$ 300,590	\$ 300,590	\$ -	\$ 291,750	\$ (8,840)	
Operating Expenses						
Consultants & Contracts	\$ 152,000	\$ 152,000	\$ -	\$ 92,000	\$ (60,000)	
Office Rent	809,700	809,700	-	810,700	1,000	
Office Costs	679,100	679,100	-	664,760	(14,340)	
Professional Services	1,041,000	1,041,000	-	960,000	(81,000)	
Computer & Equipment Leases	-	-	-	-	-	
Miscellaneous	50,000	50,000	-	50,000	-	
Depreciation	250,000	250,000	-	269,000	19,000	
Total Operating Expenses	\$ 2,981,800	\$ 2,981,800	\$ -	\$ 2,846,460	\$ (135,340)	
Total Direct Expenses	\$ 5,984,868	\$ 5,984,868	\$ -	\$ 6,032,732	\$ 47,864	
Indirect Expenses	\$ (5,984,868)	\$ (5,984,868)	\$ -	\$ (6,032,732)	\$ (47,864)	
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses (B)	\$ -	\$ -	\$ -	\$ 0	\$ 0	
Change in Assets	\$ (185,991)	\$ (185,991)	\$ -	\$ (66,581)	\$ 119,409	
Fixed Assets						
Depreciation	(250,000)	(250,000)	\$ -	(269,000)	\$ (19,000)	
Computer & Software CapEx	125,000	125,000	-	75,000	(50,000)	
Furniture & Fixtures CapEx	-	-	-	-	-	
Equipment CapEx	-	-	-	-	-	
Leasehold Improvements	-	-	-	-	-	
Allocation of Fixed Assets	125,000	125,000	-	194,000	69,000	
Inc(Dec) in Fixed Assets (C)	-	-	-	-	-	
TOTAL BUDGET (=B+C)	-	-	-	0	0	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (185,991)	\$ (185,991)	\$ -	\$ (66,581)	\$ 119,409	

Technical Committees and Member Forums

Program Scope and Functional Description

The success of the NPCC programs depends on the active and direct volunteerism and participation of its members. The stakeholders are the source of subject matter expertise in the industry. To promote the reliable and efficient operation of the interconnected bulk power systems in Northeastern North America, NPCC invites high level policy makers from Federal, Provincial and State regulatory and/or governmental authorities and senior executives within NPCC and NERC to identify and discuss emerging issues related to the reliability of the NPCC Region.

2018 Key Assumptions

- NPCC’s standing committee and subgroup structure for effective stakeholder involvement will continue in 2018.
- NPCC will continue to utilize methods to encourage active involvement in its Regional programs that require less stakeholder travel and face-to-face meetings, as the economy improves in 2018.
- NPCC will continue to invest in technology and innovation to allow efficient collaboration on technical issues related to reliability.

The Technical Committees and Member Forums activities indicated below are done in support of ERO Goal No. 4 “*Identification and Assessment of Emerging Risks to Reliability.*” A related contributing activity to this Goal is to “Educate policy makers, regulators, and the industry of reliability effects and interconnection requirements for the changing resource mix.”

Technical Committees and Member Forums 2018 Goals and Deliverables

- ✓ The 2018 NPCC General Meeting provides an opportunity for NPCC Members to meet high level policy makers from Federal, Provincial and State regulatory and/or governmental authorities and senior NERC and NPCC executives to discuss topics related to the reliable planning and operation of the power system, including consideration of emerging reliability, critical infrastructure and environmental issues; and,
- ✓ The objective of the NPCC Public Information Committee is to highlight and summarize NPCC activities and accomplishments in the past year, disseminate and coordinate the appropriate release of information to the media, respond to related requests for information, and coordinate with related NPCC Area, NERC media and public information activities. Activities anticipated include, but are not limited to:
 - Conducting the Media Event – release of the Summer 2018 NPCC Reliability Assessment; and,
 - Participation in NERC Regional communication initiatives:
 - Regional communications teleconferences as required
 - Coordination of Emergency or Blackout communications plans
 - Coordination with other NERC activities as required (i.e., situation awareness, event analysis, reliability assessments, etc.)

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

General and Administrative

Program Scope and Functional Description

The NPCC general and administrative function provides executive management of the corporation, management of NPCC office, and other administrative support programs.

NPCC total overhead expenses, such as office rent and office costs, will be charged to the Administrative Services Programs and then reallocated proportionately based on FTE to the programs through Indirect Expenses.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Consultants and Contracts

- Decrease is primarily the result of reduction in contract expenses associated with the Regional Entity Management Group.

Office Rent

- Projected increase in real estate taxes.

Legal and Regulatory

Program Scope and Functional Description

NPCC's professional legal services provide counsel to the President and CEO, Board of Directors, Senior Vice President and COO, Treasurer, General Counsel and staff on a wide range of legal and regulatory matters including legislation, corporate law, code of conduct, confidentiality, governance, employment law, tax matters, contract law and other areas affecting NPCC. In support of ERO Goal 5.c., NPCC's in-house counsel evaluates internal controls and corporate, operational, strategic and reputational risk, and participates in risk identification, evaluation and mitigation activities. In-house counsel provides legal advice to advance significant corporate policy and strategic planning initiatives and also provide legal support to other program areas on matters arising in connection with the performance of NPCC's delegated functions. In-house counsel draft agreements and pleadings and provide interpretations of relevant statutes, regulations, court opinions, and regulatory decisions of FERC, state agencies and provincial authorities. Outside counsel, as necessary, reviews items filed with the governmental agencies for legal sufficiency, maintains relationships with U.S. and Canadian jurisdictions and provides contract review.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Professional Services

- Legal fees are projected to be lower based on additional workload taken on by in-house legal team.

Information Technology

Program Scope and Functional Description

NPCC's Information Technology services ensure information assets and the environment in which they operate are secure and in conformance to NPCC IT Policies and Procedures and all applicable Critical Electric Infrastructure Information protection and Confidentiality requirements. NPCC maintains an offsite backup server for continuity of essential operations in the event that its primary location is unavailable.

NPCC supports the ERO efforts to implement, operate and maintain software tools supporting common enterprise wide operations and leveraging ERO solutions which have been approved by the ERO Executive Management Group (ERO EMG), which is comprised of the senior leadership of NERC and each of the Regional Entities. NPCC's budget assumes the availability of enterprise software tools as described in NERC's business plan and budget. If implementation of these software applications is delayed or otherwise not available as planned, NPCC could incur additional costs to implement ERO Enterprise-wide programs pending the availability of these applications.

NERC and the Regional Entities are committed to working collaboratively to minimize duplication of effort and investments, and improve operational efficiency. This collaboration continues to refine existing strategies, governance and procurement practices applicable to the development, operation and maintenance of enterprise architecture, software and data systems supporting complementary and combined NERC and Regional Entity operations.

The NERC information technology budget does not supplant NPCC's need for IT expenditures for specific regional projects and internal region specific IT support needs. NPCC's 2018 Business Plan and Budget assumes agreed-upon ERO Enterprise applications will be available and includes only NPCC costs for region specific support needs.

2018 Key Assumptions

- Continue to maintain the compliance portal through collaboration with other Regional Entities and NERC (CUG).
- Support the Event Analysis program through continued participation in the tools used for the tracking and analysis of system events and identification of better practice elements.
- Support the Bulk Electric System Exception Process (BEP) to enable and facilitate tracking and processing of exceptions submitted. Maintenance of the BESNET support services such as updates, patching, coordinating issues with NERC.
- Support Cyber Security Reviews done by Compliance to provide advisory role during those reviews.

2018 Goals and Key Deliverables

Responsibilities encompass a variety of complex technical, administrative, and supervisory work in the development, installation, and maintenance of information technology systems. IT goals include, but are not limited to:

- Expand the utilization of the document management system throughout the company.
- Create an information security program and environment aimed at reducing breach of security risks.
- Determine longer-term software and systems needs and hardware acquisitions.
- Develop and implement information security standards and procedures.

- Ensure all information systems are functional and secure, and that all applications running on those systems meet business requirements for performance, availability, and security.
- Plan and implement organization-wide information systems, services, and network facilities, including local area networks, wide-area networks, and peripheral systems.
- Provide outreach and education to NPCC members in IT best practices.
- Continually improve Disaster Recovery and Business Continuity policies and practices to ensure continuity and reliability of IT and business related services.

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Fixed Assets

- Capital expenditures planned for 2018 include the continuing implementation of an Enterprise Content Management system.

Human Resources

Program Scope and Functional Description

NPCC has assembled an exceptional team of highly qualified employees to carry out the activities of NPCC. The human resources function, in adherence with applicable federal and state laws, designs, plans, and implements human resources policies and procedures, including: staffing; compensation; benefits; employee relations; training and development; and employee time tracking.

Resource Requirements

Personnel

- Temporary office services increased to assist in administrative services in the area of human resources.

Accounting and Finance

Program Scope and Functional Description

The accounting and finance function directs the overall financial plans and accounting practices of the organization; oversees treasury, accounting, budget, tax, and audit activities; and oversees financial and accounting system controls and standards. NPCC uses a CPA firm to prepare its unaudited statements of activities and financial statements for quarterly reviews. Independent audits have identified this system as a best practice.

2018 Goals and Key Deliverables

The objectives are to provide or obtain the financial and accounting services for NPCC and coordinate with NERC requirements:

- Utilize the NERC System of Accounts for consistency
- Utilize an accrual method of accounting for consistency with NERC in methodology
- Alignment of changes in budget and changes in aggregate assessment
- Cash Management
- Budget Development using the NERC budget template formats
- Forecasts and Projections
- Alignment of NPCC Committees, Task Forces and Working Groups with the programs
- Payroll and expense administration
- Preparation of unaudited Quarterly Financial Variance Reports
- IRS Reporting
- Annual Independent Audit initiated by the Regional Entity

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

Regional Entity Assessment Analysis

In the area of assessments there are distinct funding mechanisms as outlined in the following table. For the Regional Entity division, the North American Electric Reliability Corporation (NERC) will assess load serving entities (LSEs) or their designees (within NPCC the designees are the Balancing Authority Areas (BAAs) for New York, New England, New Brunswick, Nova Scotia, Ontario and Québec) based upon 2016 proportional Net Energy for Load (NEL) and other specific program area funding arrangements and make quarterly remittances to the Regional Entity on or about the 15th day of January, April, July and October. For funding associated with the Criteria Services division, the Independent System Operators/Balancing Authority Areas (ISO/BAAs) will be assessed by NPCC for their proportional share of the divisional budget based upon 2016 NEL within the Region. Non ISO/BAA Full Members will be assessed no membership fee.

NPCC Cost Allocation Methodology

The accompanying table provides information regarding cost allocation for both the Regional Entity division and the Criteria Services division of NPCC, including the details associated with the funding of the Compliance Program within the RE division. For purposes of determining assessments to support NPCC's resource requirements, costs are allocated among the BAAs within NPCC as the designees for the load-serving-entities in New York, New England, Ontario, Québec, New Brunswick and Nova Scotia.

In order to reflect and respect the international membership and nature of NPCC, any sub-regional reliability assessment costs in response to U.S. only regulatory initiatives will be considered for allocation to U.S. only BAAs consistent with NERC Rules of Procedure section 1102. Additionally, the compliance responsibilities and authorities within the U.S., and the specific compliance responsibilities within each of the Canadian provinces within NPCC, and the attendant costs of portions of the compliance program differ among the areas within the Regional Entity. Within the U.S. portion of NPCC all costs attributable to delegated (statutory) functions performed by NPCC, including all compliance functions, are assessed based on a NEL allocation. Within the Canadian portion of NPCC those costs attributable to compliance functions performed by NPCC on behalf of provincial governmental and/or regulatory authorities are allocated consistent with the unique Memoranda of Understanding or Agreements that have been entered into for those provinces. To address these different compliance regimes, NPCC developed a composite cost allocation methodology that allocates U.S. only reliability assessment and compliance costs on a fair and equitable basis within the Regional Entity.

As an initial step of that methodology, the NEL for each of the BAAs and their relative percentage to the NPCC total NEL is calculated for the most recent year for which data is available, the second previous year. In order to establish the RE division funding requirements for each Balancing Authority Area on a NEL basis for all programs except for Compliance, the proposed expenses and fixed assets of all other programs are calculated and the adjustment for the RE division cash reserve requirement is identified. Any penalty monies received from NPCC registered entities within the U.S. prior to June 30th of the year preceding the business plan and budget year are then allocated among the NPCC program areas based on their FTE ratio and between the U.S. BAAs based on their relative NELs. Consistent with each of the Canadian provincial MOUs and agreements, all penalty monies resulting from compliance actions within Canada, if any, would remain within the applicable province. The total budgeted fees for NPCC workshop participation are indicated as a credit, with the resultant addition being the RE division assessment, without the compliance program costs, calculated on a NEL basis.

In accordance with the *NPCC Amended and Restated Bylaws* the CS division proposed expenses and fixed assets of all programs are calculated and the adjustment for the CS division cash reserve requirement is identified, with the resultant addition being the CS division funding requirement and assessment, calculated on a NEL basis.

For costs associated with the RE division compliance program, NPCC's allocation methodology apportions 22.11% of the costs for the program, attributed to CORC Fundamentals (CF), between the BAAs in the United States and Canada on a NEL basis.

Audits and Investigations (AI) related costs, representing 55.67% of the costs of the compliance program, are allocated between U.S. and Canadian BAAs in NPCC, and among the Canadian provinces, using an audit-based methodology. The audit-based methodology incorporates relative costs based on categories of compliance audits which are reflective of their size and complexity, as well as the differing compliance program implementation models that are utilized in NPCC due to the international nature of the Regional Entity. The portion allocated to the U.S. BAAs in NPCC is calculated using the audit-based methodology, and this amount is then re-allocated between the New York and New England BAAs based on their relative NEL.

The remaining 22.22% of the costs of the compliance program represent Mitigation and Enforcement (ME) related costs and are allocated between U.S. and Canadian BAAs in NPCC, and among the Canadian provinces, using an enforcement activity based methodology. Based on historical data, NPCC reviewed each BAAs percentage of violations, mitigation plans and settlement agreements to determine each BAAs total average percentage of enforcement activities. The portion allocated to the U.S. BAAs in NPCC is calculated using the enforcement activity based methodology, and this amount is then re-allocated between the New York and New England BAAs based on their relative NEL.

Any penalty monies received from NPCC registered entities within the U.S. by June 30th of the year preceding the business plan and budget year are then allocated among the NPCC program areas based on their FTE ratio and between the U.S. BAAs based on their relative NELs, and then added to the total compliance program expenses and fixed assets to yield a total compliance program assessment.

The CORC actual vs budget variance from the most recent year for which audited financials are available is broken out from the rest of the Adjustment to Cash Reserve and assigned to the CORC program allocation of costs. Within Quebec these costs are funded directly by the regulator, therefore, the assignment of program area variances needs to respect those specific circumstances.

Finally, the total RE division funding requirements and assessments by BAA are tabulated and the total funding requirements and assessments for NPCC, both the RE and CS divisions, are combined.

NPCC 2018 Regional Entity (RE) and Criteria Services (CS) Divisional Funding Information

A-1	B-1	B-1a	C-1	C-1a	D-1	E-1	F-1	G-1	H-1	I-1	J-1	K-1	L-1	M-1
NPCC Balancing Authorities (LSE Designees)	2016 Net Energy for Load (MWh)	2016 NPCC US NEL (MWh)	2016 NPCC NEL % of Total	2016 NPCC NEL % of U.S. Only	2018 NPCC Costs with U.S. Only Reliability Study	2018 NPCC RE Division Expenses & Fixed Assets Minus CORC	2018 NPCC RE Division Cash Reserve Requirement Less CORC	2018 NPCC RE Division Funding Requirement Minus CORC	2018 NPCC Penalty Monies Applied to RE Division Minus CORC Program	2018 NPCC Budgeted Workshop Fees	2018 NPCC Assessment Minus CORC (G-1 plus H-1 plus I-1)	2018 NPCC CS Division Expenses & Fixed Assets	2018 NPCC Adjustment to CS Division Cash Reserve Requirement	2018 NPCC CS Division Funding Requirement & Member Fees (K-1 plus L-1)
New England	124,415,000	124,415,000	19.784%	43.622%	TBD	1,347,933	-13,173	1,334,761	-14,578	-12,662	1,307,520	211,093	-9,465	201,628
New York	160,798,000	160,798,000	25.370%	56.378%	TBD	1,742,113	-17,025	1,725,088	-18,842	-16,365	1,699,882	272,823	-12,233	260,590
Ontario	136,990,000	136,990,000	21.784%			1,484,173	-14,504	1,469,669	0	-13,942	1,455,727	232,429	-10,422	222,007
Quebec	182,041,000	182,041,000	28.948%			1,972,263	-19,274	1,952,989	0	-18,526	1,934,463	308,866	-13,849	295,017
New Brunswick	13,698,000	13,698,000	2.178%			148,406	-1,450	146,956	0	-1,394	145,562	23,241	-1,042	22,199
Nova Scotia	10,922,000	10,922,000	1.737%			118,331	-1,156	117,174	0	-1,112	116,063	18,531	-831	17,700
Total	628,864,000	285,213,000	100.000%	100.000%	\$0	\$68,132,219	-\$66,381	\$6,746,638	-\$33,420	-\$84,000	\$6,649,218	\$1,066,983	-\$47,843	\$1,019,141

A-2	B-2	C-2	D-2	E-2	F-2	G-2	H-2	I-2	J-2	K-2	L-2	M-2	N
NPCC Balancing Authorities (LSE Designees)	2016 NEL Based Allocation of 22.11% of 2018 CORC Program Fundamentals ³	2018 Audit and Investigation Allocation Methodology	2018 55.07% of CORC Allocation Methodology	2018 Mitigation and Enforcement Allocation Methodology	2018 22.22% of CORC Allocation Methodology	2018 Total CORC Program Expenses & Fixed Assets	2018 CORC Program Penalty Monies Applied to CORC Program	Assigned 2016 Actual vs Budget Variance	2018 Total CORC Program Assessment (G-2 plus H-2 plus I-2)	2018 RE Division Total Funding Requirement (G-1 plus G-2 plus I-2)	2018 RE Division Total Assessment (I-1 plus I-2)	2018 NPCC Total Funding Requirement (M-1 plus K-2)	2018 NPCC Total Assessment & Member Fees (M-1 plus L-2)
New England	362,829	44.323%	1,654,675	54.835%	691,616	2,709,121	-18,138	-184,559	2,506,424	3,859,323	3,813,945	4,060,950	4,015,572
New York	468,932	37.834%	2,138,556	31.203%	893,868	3,501,356	-23,442	-232,281	3,245,633	4,994,164	4,935,515	5,254,754	5,196,106
Ontario	399,502	4.363%	201,455	3.605%	3,605%	667,387	0	-8,884	618,504	2,088,173	2,074,231	2,310,179	2,296,238
Quebec	530,883	9.273%	428,134	8.922%	164,963	1,123,980	0	-73,285	1,050,695	3,003,684	2,985,158	3,298,701	3,280,175
New Brunswick	39,947	2.151%	99,304	0.829%	15,272	154,823	0	-11,087	143,436	290,392	288,998	312,591	311,197
Nova Scotia	31,852	2.056%	94,921	0.576%	10,608	137,381	0	-9,504	127,877	245,051	243,940	262,752	261,640
Total	\$1,833,945	82.157%	\$3,793,232	100.000%	\$1,535,484	\$8,239,748	-\$41,580	-\$559,599	\$7,692,569	\$14,480,787	\$14,341,787	\$15,499,927	\$15,360,927

1 Any sub-regional reliability assessment costs in response to U.S. only regulatory initiatives will be considered for allocation to U.S. only BAA's consistent with NERC Rules of Procedure section 1102.

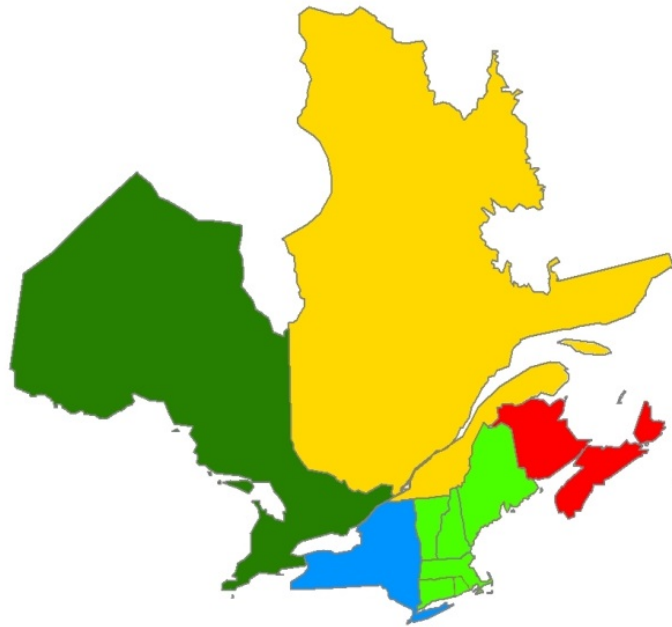
2 Consistent with NERC's Policy on Allocation of Certain Compliance and Enforcement Costs, the NPCC Board approved Allocation Methodologies for Certain NPCC Compliance Program Area Costs Assessed to Non-U.S. Entities.

3 CORC Program Fundamentals expenses of \$1,833,945 represent 22.11% of the Total CORC Program Costs and are allocated using the Regional NEL based methodology.

4 Audit and Investigation expenses of \$461,946 represent 55.07% of the Total CORC Program Costs. The Canadian costs are allocated utilizing an audit based methodology. The portion of \$2,157% attributable to U.S. NPCC is allocated between the New York and New England balancing authority areas based on their respective net energy for load (NEL) as shown in Columns B-1a and C-1a. The ratios in C-1a are applied to the 82.157% of U.S. audit costs to obtain the percentages (Column C-2) which are then applied to the 55.07% of CORC costs. Audit based allocation uses Compliance Registry Data registrants as of May 1, 2017.

5 Mitigation and Enforcement expenses of \$1,842,756 represent 22.22% of the Total CORC Program Costs. The Canadian costs are allocated utilizing an enforcement activity based methodology. The portion of \$6.03% attributable to U.S. NPCC is allocated between the New York and New England balancing authority areas based on their respective net energy for load (NEL) as shown in Columns B-1a and C-1a. The ratios in C-1a are applied to the 82.157% of U.S. enforcement costs to obtain the percentages (Column C-2) which are then applied to the 22.22% of CORC costs.

Section B — Supplemental Financial Information 2018 Business Plan and Budget



Section B – Supplemental Financial Information

Reserve Balance

Table B-1 Reserve Balance

Working Capital and Operating Reserve Analysis 2017-2018				
REGIONAL ENTITY DIVISION				
	Total Reserve	Operating Reserve	Working Capital	Business Continuity
Beginning Working Capital and Operating Reserve, December 31, 2016	5,327,887	4,069,023	1,258,864	0
Plus: 2017 ERO Funding (from LSEs or designees)	14,255,061	14,255,061		
Plus: 2017 Other funding sources	64,000	64,000		
Less: 2017 Projected expenses & capital expenditures	(15,147,054)	(15,147,054)		
Projected Working Capital and Operating Reserve, December 31, 2017	4,499,893	3,241,030	1,258,864	0
Desired Working Capital and Operating Reserve, December 31, 2018 ¹	2,933,713	1,674,849 ²	1,258,864 ³	
19.42% of Total Regional Entity Budget of \$15,106,967				
Desired Business Continuity Reserve, December 31, 2018 ⁴	940,000			940,000
Less: Projected Working Capital and Operating Reserve, December 31, 2017	(4,499,893)	(3,241,030)	(1,258,864)	
Increase(decrease) in assessments to achieve desired Total Reserve	(626,180)	(1,566,180)	0	0
2018 Expenses and Capital Expenditures	15,106,967			
Less: Penalty Sanctions ⁵	(75,000)			
Less: Other Funding Sources	(64,000)			
Adjustment to achieve desired Total Reserve balance	(626,180)			
2018 Assessment	14,341,787			

¹ Total Reserve within a range of 16.67% - 33.33% of Budget.

² Operating Reserve within a range from 8.33% to 25.00% of Budget. \$1,674,849 represents 11.09% of the 2017 budget of \$15,106,967

³ Working Capital equal to 8.33% of Budget. \$1,258,864 represents 8.33% of the 2017 budget of \$15,106,967

⁴ Establish Business Continuity Reserve as approved by the NPCC Board of Directors upon recommendation by the MDCC.

⁵ Represents collections July 1, 2016 to June 30, 2017.

Explanation of Changes in Reserve Policy from Prior Year

There was no change to the existing Working Capital and Operating Reserve Policy, however, a separate Business Continuity Reserve (BCR) in the amount of \$1,000,000 (allocated between the Regional Entity and Criteria Services divisions) was established as approved by the NPCC Board of Directors, upon recommendation by the Management Development and Compensation Committee and endorsement by the Finance and Audit Committee, to be identified as restricted cash and drawn upon as subsequently brought before the Board of Directors in association with President & CEO succession related activities associated with a planned or sudden retirement, as well as other sudden changing workforce staffing requirements.

Breakdown by Statement of Activity Sections

The following detailed schedules are in support of the Regional Entity division Statement of Activities on page 13 of the 2018 Business Plan and Budget. All significant variances have been disclosed by program area in the preceding pages.

Penalty Sanctions

U.S. penalty monies received prior to June 30, 2017 are to be used to offset assessments in the 2018 Budget, as documented in the NERC Policy – Accounting, Financial Statement, and Budgetary Treatment of Penalties Imposed and Received for Violations of Reliability Standard. Penalty monies received from July 1, 2017 through June 30, 2018 will be used to offset U.S. load serving entity designee assessments in the 2019 Budget.

Allocation Method: U.S. penalty sanctions received have been allocated to the following Regional Entity division programs to reduce assessments: Reliability Standards; Compliance Monitoring & Enforcement and Organization Registration & Certification; Reliability Assessments and Performance Analysis; Training, Education and Operator Certification; and Situation Awareness and Infrastructure Security. U.S. penalty sanctions are allocated based upon the number of FTEs in the Program divided by the aggregate total FTEs in the Programs receiving the allocation.

Table B-2 Penalty Sanctions

Penalty Sanctions Received Prior to June 30, 2016	Date Received	Amount Received
Penalty Payment 1	12/16/2016	\$ 75,000.00
Total Penalties Received		\$ 75,000.00

Table B-3 Supplemental Funding

Outside Funding Breakdown By Program (excluding ERO Assessments & Penalty Sanctions)	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget
Reliability Standards				
Total	\$ -	\$ -	\$ -	\$ -
Compliance Monitoring, Enforcement & Org. Registration				
	\$ -	\$ -	\$ -	\$ -
	-	-	-	-
Total	\$ -	\$ -	\$ -	\$ -
Reliability Assessment and Performance Analysis				
	\$ -	\$ -	\$ -	\$ -
	-	-	-	-
Total	\$ -	\$ -	\$ -	\$ -
Training and Education				
Workshops	\$ 64,000	\$ 64,000	\$ 64,000	\$ -
Total	\$ 64,000	\$ 64,000	\$ 64,000	\$ -
Situation Awareness and Infrastructure Security				
	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -
Technical Committees and Member Forums				
	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -
Administrative Services Programs				
	\$ -	\$ -	\$ -	\$ -
Total	\$ -	\$ -	\$ -	\$ -
Total Outside Funding	\$ 64,000	\$ 64,000	\$ 64,000	\$ -

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- NPCC assumed no interest income because of continuing low market interest rates.

Table B-4 Personnel Expenses

Personnel Expenses	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Salaries					
Salary	\$ 6,718,926	\$ 6,718,926	\$ 7,057,483	\$ 338,557	5.0%
Employment Agency Fees	\$ 10,000	\$ 10,000	\$ 10,000	\$ -	0.0%
Temporary Office Services	\$ 30,000	\$ 30,000	\$ 40,116	\$ 10,116	33.7%
Total Salaries	\$ 6,758,926	\$ 6,758,926	\$ 7,107,599	\$ 348,673	5.2%
Total Payroll Taxes	\$ 404,319	\$ 404,319	\$ 411,440	\$ 7,121	1.8%
Benefits					
Education Reimbursement	\$ 22,500	\$ 22,500	\$ 30,000	\$ 7,500	33.3%
Training and Seminars	\$ 36,860	\$ 36,860	\$ 44,232	\$ 7,372	20.0%
Medical Insurance	\$ 790,034	\$ 790,034	\$ 811,369	\$ 21,335	2.7%
Life-LTD-STD Insurance	\$ 88,716	\$ 88,716	\$ 90,465	\$ 1,749	2.0%
Worker's Compensation	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	0.0%
Vacation	\$ 462,494	\$ 462,494	\$ 485,312	\$ 22,818	4.9%
Relocation	\$ -	\$ -	\$ -	\$ -	-
Total Benefits	\$ 1,415,603	\$ 1,415,603	\$ 1,476,378	\$ 60,774	4.3%
Retirement					
Pension Contribution	\$ 37,000	\$ 37,000	\$ 38,000	\$ 1,000	2.7%
Employee Savings Plan	\$ 727,223	\$ 727,223	\$ 714,353	\$ (12,869)	-1.8%
Savings Admin	\$ 45,000	\$ 45,000	\$ 35,000	\$ (10,000)	-22.2%
Deferred Compensation	\$ 38,000	\$ 38,000	\$ 38,000	\$ -	0.0%
Total Retirement	\$ 847,223	\$ 847,223	\$ 825,353	\$ (21,869)	-2.6%
Total Personnel Costs	\$ 9,426,071	\$ 9,426,071	\$ 9,820,770	\$ 394,699	4.2%
FTEs	36.86	36.86	36.86	-	0.0%
Cost per FTE					
Salaries	\$ 183,367	\$ 183,367	\$ 192,827	\$ 9,459	5.2%
Payroll Taxes	\$ 10,969	\$ 10,969	\$ 11,162	\$ 193	1.8%
Benefits	\$ 38,405	\$ 38,405	\$ 40,054	\$ 1,649	4.3%
Retirement	\$ 22,985	\$ 22,985	\$ 22,392	\$ (593)	-2.6%
Total Cost per FTE	\$ 255,726	\$ 255,726	\$ 266,434	\$ 10,708	4.2%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Temporary office services were increased to provide assistance in administrative services.
- Education reimbursement cost is based on additional employee that has expressed interest in pursuing an advanced degree.
- Savings administration decrease is due to the termination of the defined benefit plan.

Table B-5 Meeting Expense

Meeting Expenses	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Meetings	\$ 377,100	\$ 377,100	\$ 353,050	\$ (24,050)	-6.4%
Travel	\$ 855,232	\$ 855,232	\$ 834,500	\$ (20,732)	-2.4%
Conference Calls	\$ 37,000	\$ 37,000	\$ 37,000	\$ -	0.0%
Total Meeting Expenses	\$ 1,269,332	\$ 1,269,332	\$ 1,224,550	\$ (44,782)	-3.5%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Continued efforts to limit the number of attendees to offsite meetings and hold more meetings on-site and via webinar.

Table B-6 Consultants and Contracts

Consultants	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Consultants					
Reliability Standards	\$ -	\$ -	\$ -	\$ -	-
Compliance Enforcement and Organization Registration and Certification	\$ -	\$ -	\$ -	\$ -	-
Reliability Assessment and Performance Analysis	\$ 35,000	\$ 35,000	\$ -	\$ (35,000)	-100.0%
Training and Education	\$ -	\$ -	\$ -	\$ -	-
Situation Awareness and Infrastructure Security	\$ -	\$ -	\$ -	\$ -	-
Member Forums	\$ -	\$ -	\$ -	\$ -	-
General and Administrative	\$ 30,000	\$ 30,000	\$ -	\$ (30,000)	-100.0%
Legal and Regulatory	\$ -	\$ -	\$ -	\$ -	-
Information Technology	\$ -	\$ -	\$ -	\$ -	-
Human Resources	\$ -	\$ -	\$ -	\$ -	-
Accounting and Finance	\$ -	\$ -	\$ -	\$ -	-
Consultants Total	\$ 65,000	\$ 65,000	\$ -	\$ (65,000)	-100.0%
Contracts	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Reliability Standards	\$ 10,000	\$ 10,000	\$ 10,000	\$ -	0.0%
Compliance Enforcement and Organization Registration and Certification	\$ 1,274,000	\$ 1,274,000	\$ 1,254,000	\$ (20,000)	-1.6%
Reliability Assessment and Performance Analysis	\$ 378,000	\$ 378,000	\$ 401,640	\$ 23,640	6.3%
Training and Education	\$ -	\$ -	\$ -	\$ -	-
Situation Awareness and Infrastructure Security	\$ 160,000	\$ 160,000	\$ 120,000	\$ (40,000)	-25.0%
Member Forums	\$ -	\$ -	\$ -	\$ -	-
General and Administrative	\$ 115,000	\$ 115,000	\$ 85,000	\$ (30,000)	-26.1%
Legal and Regulatory	\$ -	\$ -	\$ -	\$ -	-
Information Technology	\$ -	\$ -	\$ -	\$ -	-
Human Resources	\$ -	\$ -	\$ -	\$ -	-
Accounting and Finance	\$ 7,000	\$ 7,000	\$ 7,000	\$ -	0.0%
Contracts Total	\$ 1,944,000	\$ 1,944,000	\$ 1,877,640	\$ (66,360)	-3.4%
Total Consultants and Contracts	\$ 2,009,000	\$ 2,009,000	\$ 1,877,640	\$ (131,360)	-6.5%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Ongoing effort to decrease the use of consultants and contractors when possible. (See program area sections for detail regarding a specific program area.)

Section B — Supplemental Financial Information

Table B-7 Office Rent

Office Rent	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Office Rent	\$ 650,000	\$ 650,000	\$ 650,000	\$ -	0.0%
Utilities	\$ 43,000	\$ 43,000	\$ 43,000	\$ -	0.0%
Maintenance	\$ 40,000	\$ 40,000	\$ 35,000	\$ (5,000)	-12.5%
Security	\$ 2,700	\$ 2,700	\$ 2,700	\$ -	0.0%
Real Estate Taxes	\$ 74,000	\$ 74,000	\$ 80,000	\$ 6,000	8.1%
Total Office Rent	\$ 809,700	\$ 809,700	\$ 810,700	\$ 1,000	0.1%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Projected increase in real estate taxes.

Table B-8 Office Costs

Office Costs	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Telephone	\$ 112,000	\$ 112,000	\$ 111,660	\$ (340)	-0.3%
Internet Expense	\$ 105,600	\$ 105,600	\$ 95,000	\$ (10,600)	-10.0%
Office Supplies	\$ 33,000	\$ 33,000	\$ 33,000	\$ -	0.0%
Computer Supplies and Maintenance	\$ 350,000	\$ 350,000	\$ 350,600	\$ 600	0.2%
Subscriptions & Publications	\$ 13,500	\$ 13,500	\$ 13,500	\$ -	0.0%
Dues	\$ 4,400	\$ 4,400	\$ 3,400	\$ (1,000)	-22.7%
Postage	\$ 1,200	\$ 1,200	\$ 1,200	\$ -	0.0%
Express Shipping	\$ 10,000	\$ 10,000	\$ 10,000	\$ -	0.0%
Copying	\$ 26,400	\$ 26,400	\$ 26,400	\$ -	0.0%
Reports	\$ 6,000	\$ 6,000	\$ 8,000	\$ 2,000	33.3%
Stationary and Office Forms	\$ 2,000	\$ 2,000	\$ 2,000	\$ -	0.0%
Equipment Repair/Service Contracts	\$ -	\$ -	\$ -	\$ -	-
Bank Charges	\$ 15,000	\$ 15,000	\$ 10,000	\$ (5,000)	-33.3%
Sales and Use Tax	\$ -	\$ -	\$ -	\$ -	-
Merchant Credit Card Fees	\$ -	\$ -	\$ -	\$ -	-
Presentation and Publicity	\$ -	\$ -	\$ -	\$ -	-
Total Office Costs	\$ 679,100	\$ 679,100	\$ 664,760	\$ (14,340)	-2.1%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Total Office costs are expected to remain relatively flat.

Table B-9 Professional Services

Professional Services	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
BOT Fee	\$ 325,000	\$ 325,000	\$ 340,000	\$ 15,000	4.6%
BOT Search Fee	\$ 20,000	\$ 20,000	\$ -	\$ (20,000)	-100.0%
Legal - Reorganization	\$ -	\$ -	\$ -	\$ -	-
Accounting & Auditing Fees	\$ 310,000	\$ 310,000	\$ 300,000	\$ (10,000)	-3.2%
Legal Fees - Other	\$ 316,000	\$ 316,000	\$ 250,000	\$ (66,000)	-20.9%
Insurance - Commercial	\$ 70,000	\$ 70,000	\$ 70,000	\$ -	0.0%
Total Services	\$ 1,041,000	\$ 1,041,000	\$ 960,000	\$ (81,000)	-7.8%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Legal fees are projected to be lower based on additional workload taken on by in-house legal team.

Table B-10 Miscellaneous

Miscellaneous Expense	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Miscellaneous Expense	\$ 50,000	\$ 50,000	\$ 50,000	\$ -	0.0%
Total Miscellaneous Expense	\$ 50,000	\$ 50,000	\$ 50,000	\$ -	0.0%

Table B-11 Other Non-Operating Expenses

Other Non-Operating Expenses	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Interest Expense	\$ -	\$ -	\$ -	\$ -	-
Office Relocation	\$ -	\$ -	\$ -	\$ -	-
Total Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	-

Table B-12 Fixed Assets

Fixed Assets	Budget 2017	Projection 2017	Budget 2018	Variance 2018 Budget v 2017 Budget	Variance %
Depreciation	\$ (250,000)	\$ (250,000)	\$ (269,000)	\$ (19,000)	7.6%
Equipment CapEx	\$ -	\$ -	\$ -	\$ -	-
Computer & Software CapEx	\$ 276,000	\$ 276,000	\$ 115,000	\$ (161,000)	-58.3%
Furniture & Fixtures CapEx	\$ -	\$ -	\$ -	\$ -	-
Leasehold Improvements	\$ -	\$ -	\$ -	\$ -	-
Allocation of Fixed Assets	\$ -	\$ -	\$ -	\$ -	-
Total Increase (Decrease) in Fixed Assets	\$ 26,000	\$ 26,000	\$ (154,000)	\$ (180,000)	-692.3%

Explanation of Significant Variances –2018 Budget versus 2017 Budget

- Capital expenditures planned for 2018 include the continuing implementation of an Enterprise Content Management system and continuing development of Compliance Issues Tracking System and CMEP Data Administration Application.

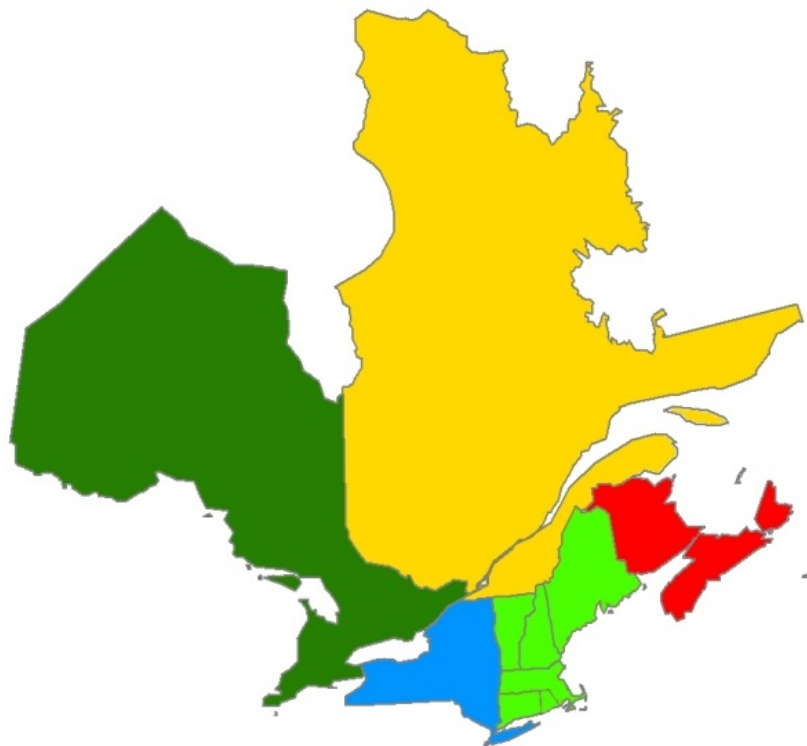
Table B-13 2019 and 2020 Projections

Statement of Activities and Capital Expenditures 2018 Budget & Projected 2019 and 2020 Budgets								
	2018 Budget	2019 Projection	\$ Change 18 v 19	% Change 18 v 19	2020 Projection	\$ Change 19 v 20	% Change 19 v 20	
Funding								
ERO Funding								
ERO Assessments	\$ 14,341,787	\$ 14,673,806	\$ 332,019	2.3%	\$ 15,032,532	\$ 358,727	2.4%	
Penalty Sanctions	75,000	-	(75,000)	-100.0%	-	-		
Total ERO Funding	\$ 14,416,787	\$ 14,673,806	\$ 257,019	1.8%	\$ 15,032,532	\$ 358,727	2.4%	
Membership Dues	-	-	-		-	-		
Testing Fees	-	-	-		-	-		
Services & Software	-	-	-		-	-		
Workshops	64,000	64,000	-	0.0%	64,000	-	0.0%	
Interest	-	-	-		-	-		
Miscellaneous	-	-	-		-	-		
Total Funding (A)	\$ 14,480,787	\$ 14,737,806	\$ 257,019	1.8%	\$ 15,096,532	\$ 358,727	2.4%	
Expenses								
Personnel Expenses								
Salaries	\$ 7,107,599	\$ 7,320,827	\$ 213,228	3.0%	\$ 7,540,452	\$ 219,625	3.0%	
Payroll Taxes	411,440	423,784	12,343	3.0%	436,497	12,714	3.0%	
Benefits	1,476,378	1,564,960	88,583	6.0%	1,658,858	93,898	6.0%	
Retirement Costs	825,353	850,114	24,761	3.0%	875,617	25,503	3.0%	
Total Personnel Expenses	\$ 9,820,770	\$ 10,159,685	\$ 338,914	3.5%	\$ 10,511,424	\$ 351,739	3.5%	
Meeting Expenses								
Meetings	\$ 353,050	\$ 356,581	\$ 3,531	1.0%	\$ 360,146	\$ 3,566	1.0%	
Travel	834,500	842,845	8,345	1.0%	851,273	8,428	1.0%	
Conference Calls	37,000	37,370	370	1.0%	37,744	374	1.0%	
Total Meeting Expenses	\$ 1,224,550	\$ 1,236,796	\$ 12,246	1.0%	\$ 1,249,163	\$ 12,368	1.0%	
Operating Expenses								
Consultants & Contracts	\$ 1,877,640	\$ 1,877,640	-	0.0%	\$ 1,877,640	\$ -	0.0%	
Office Rent	810,700	818,807	8,107	1.0%	826,995	8,188	1.0%	
Office Costs	664,760	678,055	13,295	2.0%	691,616	13,561	2.0%	
Professional Services	960,000	960,000	-	0.0%	960,000	-	0.0%	
Miscellaneous	50,000	50,500	500	1.0%	51,005	505	1.0%	
Depreciation	269,000	271,690	2,690	1.0%	274,407	2,717	1.0%	
Total Operating Expenses	\$ 4,632,100	\$ 4,656,692	\$ 24,592	0.5%	\$ 4,681,663	\$ 24,971	0.5%	
Total Direct Expenses	\$ 15,677,420	\$ 16,053,172	\$ 375,752	2.4%	\$ 16,442,251	\$ 389,078	2.4%	
Indirect Expenses	\$ (416,453)	\$ (424,782)	\$ (8,329)	2.0%	\$ (433,278)	\$ (8,496)	2.0%	
Other Non-Operating Expenses	\$ -	\$ -	\$ -		\$ -	\$ -		
Total Expenses (B)	\$ 15,260,967	\$ 15,628,390	\$ 367,423	2.4%	\$ 16,008,973	\$ 380,583	2.4%	
Change in Assets	\$ (780,180)	\$ (890,585)	\$ (110,404)	14.2%	\$ (912,441)	\$ (21,856)	2.5%	
Fixed Assets								
Depreciation	\$ (269,000)	\$ (271,690)	\$ (2,690)	1.0%	\$ (274,407)	\$ (2,717)	1.0%	
Computer & Software CapEx	115,000	100,000	(15,000)	-13.0%	100,000	-	0.0%	
Furniture & Fixtures CapEx	-	-	-		-	-		
Equipment CapEx	-	-	-		-	-		
Leasehold Improvements	-	-	-		-	-		
(Incr)Dec in Fixed Assets (C)	\$ (154,000)	\$ (171,690)	\$ (17,690)	11.5%	\$ (174,407)	\$ (2,717)	1.6%	
TOTAL BUDGET (=B+C)	\$ 15,106,967	\$ 15,456,700	\$ 349,733	2.3%	\$ 15,834,566	\$ 377,866	2.4%	
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ (626,180)	\$ (718,895)	\$ (92,714)	14.8%	\$ (738,034)	\$ (19,139)	0.0%	
FTEs	36.86	36.86	0	0.0%	36.86	0	0.0%	

Assumptions

- No changes in assumptions
- Staffing remains flat
- Change in assessments is equal to change in total budget

Section C — Criteria Services Division Activities 2018 Business Plan and Budget



Section C – Criteria Services Division Activities

Criteria Services Division			
(in whole dollars)			
	2017 Budget	2018 Budget	Increase (Decrease)
Total FTEs	2.14	2.14	0.00
Total Direct Expenses	\$623,747	\$666,530	\$42,783
Total Indirect Expenses	\$413,149	\$416,453	\$3,304
Other Non-Operating Expenses	\$0	\$0	\$0
Working Capital and Operating Reserves Requirement	\$78,971	(\$47,843)	(\$126,813)
Inc(Dec) in Fixed Assets	(\$10,000)	(\$16,000)	(\$6,000)
Funding Requirement	\$1,105,867	\$1,019,141	(\$86,726)

NPCC Regionally-Specific Criteria Services Background

NPCC Criteria Services division activities are based on the development, maintenance (including retirement when no longer needed), and promulgation of new or revised Regionally-specific, more stringent reliability criteria and supporting guideline or procedural documents. The requirements in NPCC Reliability Criteria apply only to those facilities defined as NPCC Bulk Power System elements through the performance based methodology identified in the NPCC Document A-10, “Classification of Bulk Power System Elements”.

In accordance with the NERC Rules of Procedure (RoP) Section 313, Regional Entities may develop Regional Criteria necessary to implement, augment, or facilitate compliance with NERC Reliability Standards. These Regional Criteria may also be utilized to address issues not within the scope or jurisdiction of FERC as outlined in Section 215 of the Federal Power Act, such as resource adequacy. Regional Criteria may also address Canadian Provincial reliability issues, and may include specific operating or planning parameters, guides, agreements, protocols or other documents used to enhance the reliability of the Bulk Power System in the Region. These documents typically provide benefits by promoting more consistent implementation of the NERC Reliability Standards within the Region. These documents are not NERC Reliability Standards, Regional Reliability Standards, or Regional Variances, and therefore are not enforceable under the authority delegated by NERC pursuant to delegation agreements.

As NERC Reliability Standards are revised or new standards are developed, NPCC performs reviews of any associated Regional Criteria for possible impact.

For 2018 and beyond, the potential reliability impacts of increased penetration of Distributed Energy Resources “DER” (e.g. solar and wind), and changing fuel mixes warrant further consideration. The Criteria Services Division has a unique opportunity to review these issues and develop criteria, guideline, and procedural documents for DER which may be outside of the jurisdiction of FERC and NERC Reliability Standards. Participation of the entities responsible for development of DER renewable resources to develop reliability documents will become increasingly important over time. Outreach, collaboration, and coordination of topics related to DER will enable NPCC to develop guidelines allowing more effective integration of these resources.

Membership and Governance

Full members, in accordance with NPCC's Amended and Restated Bylaws, are subject to compliance with Regionally-specific criteria and receive criteria-related services from the Criteria Services division.

Full Members, aside from those who perform the Balancing Authority function, are not assessed an annual membership fee. Those that perform Balancing Authority functions are assessed and remit a proportional net energy for load share of expenses for Criteria Services. NPCC would also directly assign Criteria Service division costs to a Balancing Authority Area or entity, where significant costs are incurred for that Balancing Authority Area. The funding for NPCC's Criteria Services division is approved by the NPCC Board of Directors.

Under Criteria Services NPCC will identify for membership, those entities involved in emerging technologies to assure that those entities that have an impact on Bulk Electric System reliability are included in appropriate NPCC activities.

Criteria Services Division Functional Scope

Through its Criteria Services division, NPCC promotes the reliable and efficient operation of the international, interconnected bulk power systems in Northeastern North America through the establishment of Regionally-specific criteria, and monitoring and enforcement of compliance with such criteria.

NPCC provides Full Members with Regional reliability assurance services, and acts as the vehicle through which States and Provinces can fulfill their political mandates, with respect to resource adequacy, as well as overseeing the Northeastern North American electric infrastructure.

Major 2018 Assumptions and Cost Impacts

The Criteria Services division activities are expected to remain stable or slightly increase throughout 2018 depending on reliability need.

- The Criteria Compliance Enforcement Program (CCEP) review and evaluation process is the mechanism for monitoring key criteria attributes as determined by the respective NPCC Task Forces and the Compliance Committee.
- Past non-compliances, if any, followed the due process stated in the CCEP-1 process document and proper resolution/enforcement action taken.

2018 Primary Goals and Objectives

- Continue with the development and maintenance of a set of NPCC Directories which augment or add specificity to the NERC Reliability Standards and which clearly delineate the more stringent NPCC criteria requirements. The combination of North American and more stringent NPCC Regional criteria provide for consistency and operational clarity while providing more robust defense in-depth, results based, criteria requirements to ensure NPCC BPS reliability.
- Continually review the criteria found in the NPCC Directories and the ERO standards to ensure no redundancies or inconsistencies exist.
- Retire Directories and/or Criteria which have been overtaken by improved NERC standards.
- Identify opportunities to develop criteria, procedures or guideline documents to address reliability related matters with DER.

- Continually file revised and updated more stringent requirements with the New York State Department of Public Service and Canadian Provinces as applicable.
- Review, maintain, and revise the NPCC Regional Reliability Directories to facilitate compliance assessments and ensure the Criteria portions of the Directories are “not inconsistent” with, nor duplicative with, the approved and effective NERC Standards.
- The Criteria Services division and CCEP Working Group (reporting to the Compliance Committee) will work with the various Task Forces to develop Criteria Compliance Reporting Forms for any additional NPCC Directories to ensure that the more stringent or Regionally-specific criteria is being met.
- The Criteria Services division and CCEP working group will work with TFCO, TFCP, TFSS, and TFSP to review criteria and measures within each specific NPCC Directory to identify and develop them into specific reporting forms for approval.
- Continually review impact of Bulk Electric System definition on Directory and Criteria content and compliance reporting.
- Continually review potential impacts of Sector or NPCC organizational changes on the Directories and Criteria by performing a review of enforcement and arbitration processes as needed.
- Assist Legal with preparation of revised Directories for Regulatory filings with the individual Provinces in accordance with their respective Memorandum of Understandings (MOUs) as well as the State of New York Public Service Commission.
- Facilitate any requested clarifications for NPCC Criteria with the necessary subject matter experts and also identify any other potential opportunities for clarifications of the Criteria.
- Conduct review of the following Documents:
 - Directory No. 7 – *Special Protection Systems* – the TFSP will serve as lead Task Force working in conjunction with TFCP and TFSS on revisions required to ensure consistency with the development of the NERC standard on Remedial Action Schemes.
 - *A-10 - Classification of Bulk Power System Elements* - the TFCP will conclude its review of the A-10 methodology in 2018.
 - Review and respond to Requests for Clarifications to existing NPCC Standards, Directories, and Criteria.

NPCC Reliability Directory Maintenance and Development

The NPCC Regional Reliability Directories were developed to demonstrate that the NPCC more stringent criteria augment, add specificity, or address issues not covered in the NERC Reliability Standards as mandated by the NERC Rules of Procedure. The conversion of NPCC’s reliability criteria into Directories was undertaken to remove any redundancies with the NERC or NPCC Regional Reliability Standards and to clearly delineate the more stringent NPCC criteria requirements, assign Functional Model designations to those responsible for compliance and create measurable compliance criteria. Subsequent to the initial establishment of the Directories, which also organized functionally related B Guidelines and C Procedures into a single Directory, the Directories were further reviewed to translate existing criteria language into a requirements and “standards type” format. The development of the criteria into NERC style requirements facilitates the NPCC Region’s CCEP and also ensures the delineation of the more stringent and more specific Regional criteria from the latest approved and effective set of NERC ERO standards.

In 2018, work will continue with the maintenance, revision, or potential retirement of individual Directories to address any actual or anticipated redundancies with new or modified NERC or

NPCC Reliability Standards. The ongoing review and maintenance of the Directories will require Task Force and Criteria Services staff to support this effort and to serve as subject matter experts. In addition to the ongoing review of the criteria within the Directories for potential duplicity with the NERC standards, any Directories that have not had the criteria translated into NERC style requirements will also be reviewed in order to achieve criteria ‘requirements’ which are clear, concise and measurable. Also, a standards style template will continue to be applied to the existing Directories to make them more consistent with the format of NERC standards. As NERC standards improve, the need for NPCC Directories and the amount of criteria contained therein may decrease over time, however in the interim, significant review is necessary to ensure the criteria remain consistent with the NERC standards as outlined in the NERC Rules of Procedure. NPCC will conduct internal reviews of all draft standards against Regional criteria and utilize subject matter experts to identify reliability and compliance related concerns. NPCC will file the revised NPCC Directories and notifications of retirements of Directories with the Canadian governmental and/or provincial Regulatory authorities within the NPCC “footprint”, on an as needed basis, in accordance with established provincial procedures and agreements executed with NPCC.

NPCC Operations and Planning Directories

The following Directories are envisioned to remain active for 2018.

Directory #1, Design and Operation of the Bulk Power System.

This Directory documents NPCC’s Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with all the existing NERC TPL, BAL, IRO, INT, MOD, TOP, PRC and VAR standards. The NPCC TFCP and TFCO completed a review of the Directory#1 criteria in 2015, during which the criteria was translated into NERC style requirements and revisions were enacted to ensure consistency with recent changes to the TPL and TOP standards.

Directory #2, Emergency Operations

This Directory documents NPCC’s Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with all the existing NERC EOP and TOP standards. The NPCC Task Force on Coordination of Operation is reviewing this Directory in 2017.

Directory #4, System Protection Criteria

This Directory documents NPCC’s Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with certain applicable NERC PRC standards. The NPCC Task Force on System Protection will lead this review and revision.

Directory #5, Reserve

This Directory documents NPCC’s Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with all the existing applicable NERC BAL, INT, and IRO standards. The NPCC Task Force on Coordination of Operation will lead this review and revision and ensure consistency with the BAL standards.

Directory #7, Special Protection Systems

This Directory documents NPCC’s Regionally-specific, more stringent criteria for application and approval of SPS. The NPCC Task Force on System Protection will lead this review and revision and ensure consistency with the Remedial Action Scheme PRC-012 standard.

Directory #8, *System Restoration*

This Directory documents NPCC's Regionally-specific, more stringent criteria with which each applicable entity must plan for and perform power system restoration following a major or a total blackout, and demonstrates coordination and consistency with applicable NERC EOP standards. The NPCC Task Force on Coordination of Operation lead the review and revision of this Directory in 2017. The Directory was re-formatted to be consistent with the style of NERC standards.

Directory #11, *Disturbance Monitoring Equipment*,

This directory documents NPCC's Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with certain existing NERC PRC standards. The NPCC Task Force on System Protection anticipates the development and approval of Directory#11 in order to facilitate the retirement of PRC -002-NPCC-1 and will lead this review and revision.

Directory #12, *Automatic UFLS Program Requirements*,

This Directory documents NPCC's Regionally-specific, more stringent criteria, and demonstrates coordination and consistency with certain existing NERC and NPCC PRC standard(s). The NPCC Task Force on System Studies will lead this review and revision until such time as the NPCC PRC-006-01 UFLS Regional Standard is approved by the NPCC membership, NERC BOT, the FERC and all the applicable governmental authorities in the Provinces of Canada within NPCC's footprint.

NPCC Criteria Compliance and Enforcement Program (CCEP)

The NPCC Criteria Services division supports the reliable operation of the NPCC Bulk Power System (BPS) through implementation of the NPCC Criteria Compliance Program (CCEP). This program monitors, assesses and enforces compliance with regionally specific, more stringent NPCC Criteria. The criteria are unique to the NPCC BPS and are not duplicative of the NERC Reliability Standards. The criteria evolved over many years and were determined to be technically necessary, to maintain the reliability of the NPCC BPS and prevent cascading outages. In addition, the physical characteristics and topology of the transmission system within the Region require that these specific, more stringent criteria be developed and that compliance be monitored for these criteria.

NPCC Membership, in conjunction with the Criteria Services Division of the NPCC Staff, developed the CCEP. The NPCC Compliance Committee administers the CCEP. The NPCC Compliance Committee is a stakeholder body consisting of NPCC Members, structured with seven sectors. They are Transmission Owners; Reliability Coordinators; Transmission Dependent Utilities, Distribution Providers and Load-Serving Entities; Generator Owners; Marketers, Brokers and Aggregators; Regulators; Sub-Regional Reliability Councils, Customers, Other Regional Entities and Interested Entities.

Non-compliance to NPCC Criteria are not subject to monetary sanctions, whereas violations of NERC Reliability Standards are subject to monetary sanctions. Currently non-compliance of NPCC Criteria result in escalating notification to appropriate entities based on the severity of the non-compliance.

The following two guiding documents describe the implementation of the CCEP:

- The CCEP program is described in document CCEP-1, *NPCC Criteria Compliance and Enforcement Program (CCEP) Process Document*
- The implementation plan is described in document CCEP-2, *Implementation Plan for 2011 NPCC Criteria Compliance and Enforcement Program*

The NPCC Compliance Committee reviews these documents on a regular basis. Should the NPCC Compliance Committee revise the CCEP-1 document, it will prepare an approved final version that is distributed to the NPCC Membership for vote. As the CCEP is only applicable to the NPCC Criteria, which is the responsibility of the Full Members of NPCC, the Full Members of NPCC must vote on revisions to the document

The CCEP-1 document also:

- 1) Provides a comprehensive CCEP Process Diagram showing the process of evaluating and approving Criteria Certification submittals, and additional processes and responsibilities in the event that non-compliances, disputes and sanctions arise;
- 2) Describes the roles and responsibilities of Reporting Members, the NPCC Compliance Committee, the NPCC Reliability Coordinating Committee and the Enforcement Panel in the compliance review and enforcement process;
- 3) Describes Levels of Non-Compliance, associated non-monetary Sanctions, Lateness Policy and the Arbitration/Dispute Resolution process;
- 4) Addresses Mitigation Plans for any violations under the enforcement process; and
- 5) Lists the Certification Forms to be submitted for review.

Annually, the CCEP Working Group, under the NPCC Compliance Committee, develops the CCEP implementation plan and also reviews the compliance submittals and prepares a report for the entire NPCC Compliance Committee. The NPCC Compliance Committee has final approval of compliance assessments related to CCEP. Once the Compliance Committee approves the final report, it is presented to the NPCC Reliability Coordinating Committee for its approval.

Compliance to the NPCC Criteria is a responsibility of the NPCC Members and is codified in the *AMENDED AND RESTATED BYLAWS OF NORTHEAST POWER COORDINATING COUNCIL, INC.* Implementation of the CCEP is also consist with the current Memorandum of Understanding that NPCC has with its Canadian Members.

Explanation of Significant Variances – 2018 Budget versus 2017 Budget

Resource Requirements

Personnel

- NPCC anticipates no need to hire additional personnel in this program area in 2018.

2017 Budget and Projection and 2018 Budget Comparisons

Statement of Activities and Capital Expenditures						
2017 Budget & Projection, and 2018 Budget						
CRITERIA SERVICES DIVISION						
				Variance		Variance
	2017	2017	2017 Projection	v 2017 Budget	2018	2018 Budget
	Budget	Projection	Over(Under)	Budget	v 2017 Budget	Over(Under)
Funding						
ERO Funding						
ERO Assessments	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Penalty Sanctions	-	-	-	-	-	-
Total ERO Funding	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Membership Dues	1,105,867	1,105,867	-	1,019,141	(86,726)	-
Testing Fees	-	-	-	-	-	-
Services & Software	-	-	-	-	-	-
Workshops	-	-	-	-	-	-
Interest	-	-	-	-	-	-
Miscellaneous	-	-	-	-	-	-
Total Funding (A)	\$ 1,105,867	\$ 1,105,867	\$ -	\$ 1,019,141	\$ (86,726)	\$ -
Expenses						
Personnel Expenses						
Salaries	\$ 401,142	\$ 401,142	\$ -	\$ 404,848	\$ 3,706	-
Payroll Taxes	23,301	23,301	-	23,413	112	-
Benefits	69,100	69,100	-	74,991	5,892	-
Retirement Costs	42,605	42,605	-	43,272	667	-
Total Personnel Expenses	\$ 536,147	\$ 536,147	\$ -	\$ 546,523	\$ 10,376	\$ -
Meeting Expenses						
Meetings	\$ 5,000	\$ 5,000	\$ -	\$ 5,000	\$ -	-
Travel	51,600	51,600	-	55,647	4,047	-
Conference Calls	-	-	-	-	-	-
Total Meeting Expenses	\$ 56,600	\$ 56,600	\$ -	\$ 60,647	\$ 4,047	\$ -
Operating Expenses						
Consultants & Contracts	\$ 18,000	\$ 18,000	\$ -	\$ 40,360	\$ 22,360	-
Office Rent	-	-	-	-	-	-
Office Costs	-	-	-	-	-	-
Professional Services	-	-	-	-	-	-
Computer & Equipment Leases	-	-	-	-	-	-
Miscellaneous	3,000	3,000	-	3,000	-	-
Depreciation	10,000	10,000	-	16,000	6,000	-
Total Operating Expenses	\$ 31,000	\$ 31,000	\$ -	\$ 59,360	\$ 28,360	\$ -
Total Direct Expenses	\$ 623,747	\$ 623,747	\$ -	\$ 666,530	\$ 42,783	\$ -
Indirect Expenses	\$ 413,149	\$ 413,149	\$ -	\$ 416,453	\$ 3,304	\$ -
Other Non-Operating Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses (B)	\$ 1,036,896	\$ 1,036,896	\$ -	\$ 1,082,983	\$ 46,087	\$ -
Change in Assets	\$ 68,971	\$ 68,971	\$ -	\$ (63,843)	\$ (132,813)	\$ -
Fixed Assets						
Depreciation	\$ (10,000)	(10,000)	\$ -	\$ (16,000)	\$ (6,000)	-
Computer & Software CapEx	-	-	-	-	-	-
Furniture & Fixtures CapEx	-	-	-	-	-	-
Equipment CapEx	-	-	-	-	-	-
Leasehold Improvements	-	-	-	-	-	-
Allocation of Fixed Assets	-	-	-	-	-	-
Inc(Dec) in Fixed Assets (C)	(10,000)	(10,000)	-	(16,000)	(6,000)	-
TOTAL BUDGET (=B+C)	1,026,896	1,026,896	-	1,066,983	40,087	-
TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	\$ 78,971	\$ 78,971	\$ -	\$ (47,843)	\$ (126,813)	\$ -

Personnel Analysis

Total FTE's by Program Area	Budget 2017	Projection 2017	Direct FTEs 2018 Budget	Shared FTEs ¹ 2018 Budget	Total FTEs 2018 Budget	Change from 2017 Budget
CRITERIA SERVICES DIVISION						
Operational Programs						
Reliability Standards	1.07	1.07	1.00	0.07	1.07	0.00
Compliance Enforcement and Organization Registration and Certification	0.00	0.00	0.00	0.00	0.00	0.00
Training and Education	0.00	0.00	0.00	0.00	0.00	0.00
Reliability Assessment and Performance Analysis	1.07	1.07	1.00	0.07	1.07	0.00
Situation Awareness and Infrastructure Security	0.00	0.00	0.00	0.00	0.00	0.00
Total FTEs Operational Programs	2.14	2.14	2.00	0.14	2.14	0.00
Administrative Programs						
Member Forums	0.00	0.00	0.00	0.00	0.00	0.00
General and Administrative	0.00	0.00	0.00	0.00	0.00	0.00
Information Technology	0.00	0.00	0.00	0.00	0.00	0.00
Legal and Regulatory	0.00	0.00	0.00	0.00	0.00	0.00
Human Resources	0.00	0.00	0.00	0.00	0.00	0.00
Accounting and Finance	0.00	0.00	0.00	0.00	0.00	0.00
Total FTEs Administrative Programs	0.00	0.00	0.00	0.00	0.00	0.00
Total FTEs	2.14	2.14	2.00	0.14	2.14	0.00

¹A shared FTE is defined as an employee who performs both Regional Entity and Criteria Services division functions.

Reserve Analysis 2017 - 2018

Working Capital and Operating Reserve Analysis 2017-2018				
CRITERIA SERVICES DIVISION				
	Total Reserve	Operating Reserve	Working Capital	Business Continuity
Beginning Total Reserve, December 31, 2016	384,529	295,774	88,755	
2017 Non-Statutory Funding (from members)	1,105,867	1,105,867	0	
2017 Other funding sources	0	0	0	
Less: 2017 Projected expenses & fixed asset additions	(1,026,896)	(1,026,896)	0	
Projected Working Capital and Operating Reserve, December 31, 2017	463,500	374,745	88,755	
Desired Working Capital and Operating Reserve, December 31, 2018 ¹	355,657	266,746 ²	88,912 ³	
Desired Business Continuity Reserve, December 31, 2018	60,000			60,000
Less: Projected Working Capital and Operating Reserve, December 31, 2017	(463,500)	(374,745)	(88,755)	
Increase(decrease) in assessments to achieve desired Total Reserve	(47,843)	(107,999)	157	
2018 Funding requirement for expenses and fixed asset additions	1,066,983			
Adjustment to achieve desired Working Capital and Operating Reserve balance	(47,843)			
2017 Funding and reserve requirement	1,019,141			

¹ Total Reserve within a range of 16.67% - 33.33% of Budget.

² Total NPCC Operating Reserve must be within a range from 8.33% to 25.00% of Budget. \$266,746 represents 25.00% of the 2017 CS budget of \$1,066,983.

³ Total NPCC Working Capital must equal 8.33% of Budget. \$88,912 represents 8.33% of the 2017 CS budget of \$1,066,983.

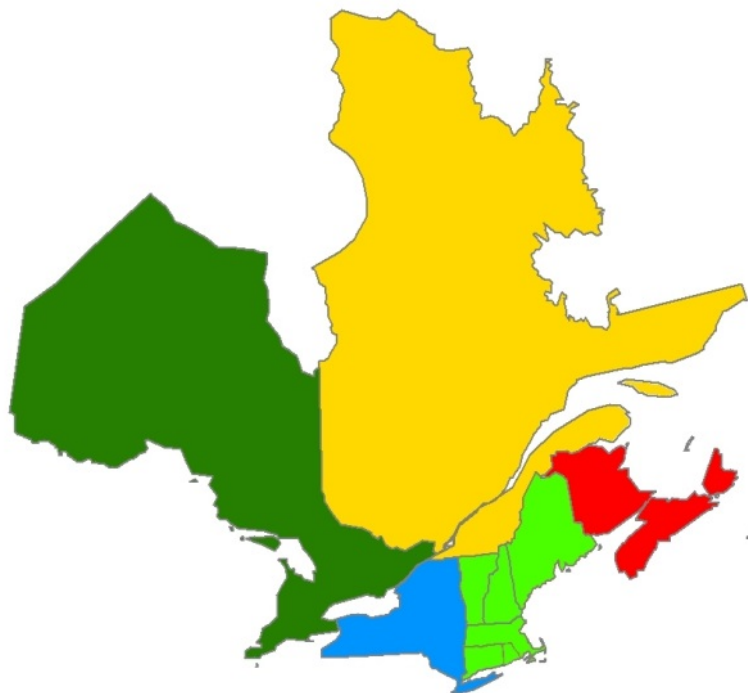
⁴ Establish Business Continuity Reserve as approved by the NPCC Board of Directors upon recommendation by the MDCC.

Explanation of Changes in Reserve Policy from Prior Year

There was no change to the existing Working Capital and Operating Reserve Policy, however, a separate Business Continuity Reserve (BCR) in the amount of \$1,000,000 (allocated between the Regional Entity and Criteria Services divisions) was established as approved by the NPCC Board of Directors, upon recommendation by the Management Development and Compensation Committee and endorsement by the Finance and Audit Committee, to be identified as restricted cash and drawn upon as subsequently brought before the Board of Directors in association with President & CEO succession related activities associated with a planned or sudden retirement, as well as other sudden changing workforce staffing requirements.

Section D – Additional Consolidated Financial Statements

2018 Business Plan and Budget



Section D — Additional Financial Statements

Statement of Financial Position

Statement of Financial Position				
2016 Audited, 2017 Projection, and 2018 Budget				
Regional Entity and Criteria Services Division				
		Actual		
		(Per Audit)	Projected	Budget
		31-Dec-16	31-Dec-17	31-Dec-18
ASSETS				
Cash		7,176,480	5,553,000	4,825,000
Restricted cash		225,224	225,000	150,000
Temporary cash investments		1,811,039	1,811,000	1,811,000
Prepaid expenses		342,349	340,000	340,000
Other assets		178,306	203,000	231,000
Equipment and leasehold improvements, net		788,564	792,000	622,000
Total Assets		10,521,962	8,924,000	7,979,000
LIABILITIES AND NET ASSETS				
Liabilities				
Accrued expenses and other liabilities		2,489,073	2,514,000	2,542,000
Deferred revenue		823,560	-	-
Deferred rent		633,349	580,000	526,000
Total Liabilities		3,945,982	3,094,000	3,068,000
Net Assets - unrestricted		6,575,980	5,830,000	4,911,000
Total Liabilities and Net Assets		10,521,962	8,924,000	7,979,000

Section D — Additional Financial Statements

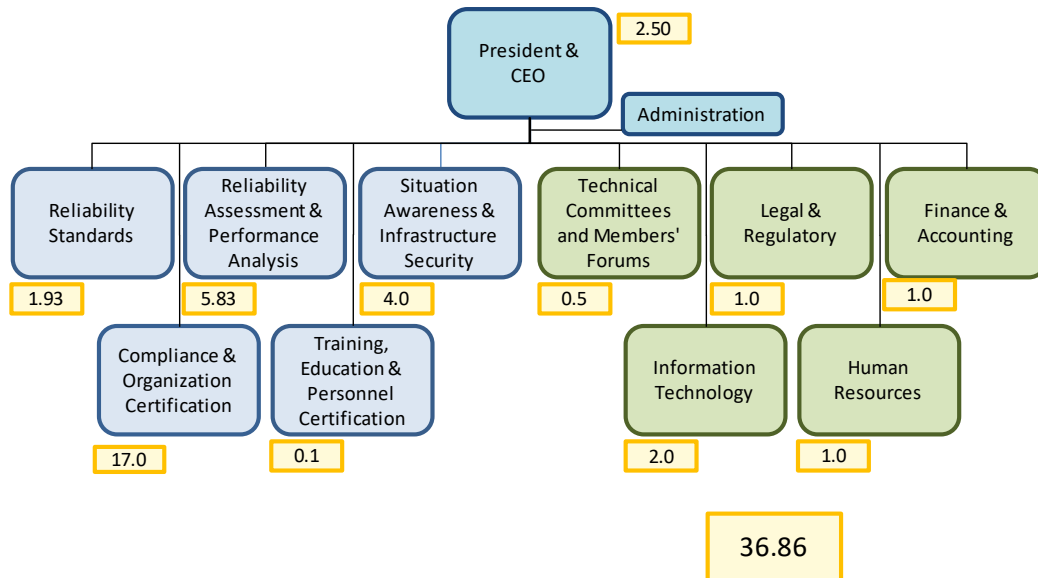
NPCC Statement of Activities 2018 Budget		RE Division Total	Reliability Standards (Section 300)	Compliance Monitoring and Enforcement Registration and Certification (Section 400 & 500)	Reliability Assessment and Performance Analysis (Section 800)	Training, Education, and Operator Certification (Section 900)	Situation Awareness and Infrastructure Security (Section 1000)	Administrative Services
Funding								
ERO Funding								
	ERO Assessments	14,341,787	1,005,230	7,692,569	3,225,570	184,791	2,300,208	(66,581)
	Penalty Sanctions	75,000	5,016	41,580	15,151	260	12,994	
	Total ERO Funding	14,416,787	1,010,246	7,734,149	3,240,721	185,051	2,313,202	(66,581)
	Membership Dues	-	-	-	-	-	-	-
	Testing Fees	-	-	-	-	-	-	-
	Services & Software	-	-	-	-	-	-	-
	Workshops	64,000	-	-	-	64,000	-	-
	Interest	-	-	-	-	-	-	-
	Miscellaneous	-	-	-	-	-	-	-
	Total Funding (A)	14,480,787	1,010,246	7,734,149	3,240,721	249,051	2,313,202	(66,581)
Expenses								
Personnel Expenses								
	Salaries	7,107,599	377,093	2,716,635	1,106,772	18,399	825,560	2,063,139
	Payroll Taxes	411,440	21,390	171,841	65,805	1,350	53,677	97,378
	Benefits	1,476,378	98,851	524,801	220,007	4,893	189,417	438,408
	Retirement Costs	825,353	40,299	282,356	117,144	2,320	87,637	295,596
	Total Personnel Expenses	9,820,770	537,633	3,695,634	1,509,728	26,963	1,156,291	2,894,522
Meeting Expenses								
	Meetings	353,050	7,000	9,000	22,000	188,300	10,000	116,750
	Travel	834,500	93,000	289,000	212,000	15,000	87,500	138,000
	Conference Calls	37,000	-	-	-	-	-	37,000
	Total Meeting Expenses	1,224,550	100,000	298,000	234,000	203,300	97,500	291,750
Operating Expenses								
	Consultants & Contracts	1,877,640	10,000	1,254,000	401,640	-	120,000	92,000
	Office Rent	810,700	-	-	-	-	-	810,700
	Office Costs	664,760	-	-	-	-	-	664,760
	Professional Services	960,000	-	-	-	-	-	960,000
	Miscellaneous	50,000	-	-	-	-	-	50,000
	Depreciation	269,000	-	-	-	-	-	269,000
	Total Operating Expenses	4,632,100	10,000	1,254,000	401,640	-	120,000	2,846,460
	Total Direct Expenses	15,677,420	647,633	5,247,634	2,145,368	230,263	1,373,791	6,032,732
	Indirect Expenses	(416,453)	375,586	3,113,668	1,134,543	19,460	973,021	(6,032,732)
	Other Non-Operating Expenses	-	-	-	-	-	-	-
	Total Expenses (B)	15,260,967	1,023,220	8,361,302	3,279,911	249,723	2,346,812	-
	Change in Assets	(780,180)	(12,974)	(627,153)	(39,190)	(672)	(33,611)	(66,581)
Fixed Assets								
	Depreciation	(269,000)	-	-	-	-	-	(269,000)
	Computer & Software CapEx	115,000	-	40,000	-	-	-	75,000
	Furniture & Fixtures CapEx	-	-	-	-	-	-	-
	Equipment CapEx	-	-	-	-	-	-	-
	Leasehold Improvements	-	-	-	-	-	-	-
	Allocation of Fixed Assets	0	(12,974)	(107,554)	(39,190)	(672)	(33,611)	194,000
	Inc (Dec) in Fixed Assets (C)	(154,000)	(12,974)	(67,554)	(39,190)	(672)	(33,611)	-
	TOTAL BUDGET (=B + C)	15,106,967	1,010,246	8,293,748	3,240,721	249,051	2,313,202	-
	TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	(626,180)	(0)	(559,599)	0	0	0	(66,581)
	FTEs	36.86	1.93	16.00	5.83	0.10	5.00	8.00

Section D — Additional Financial Statements

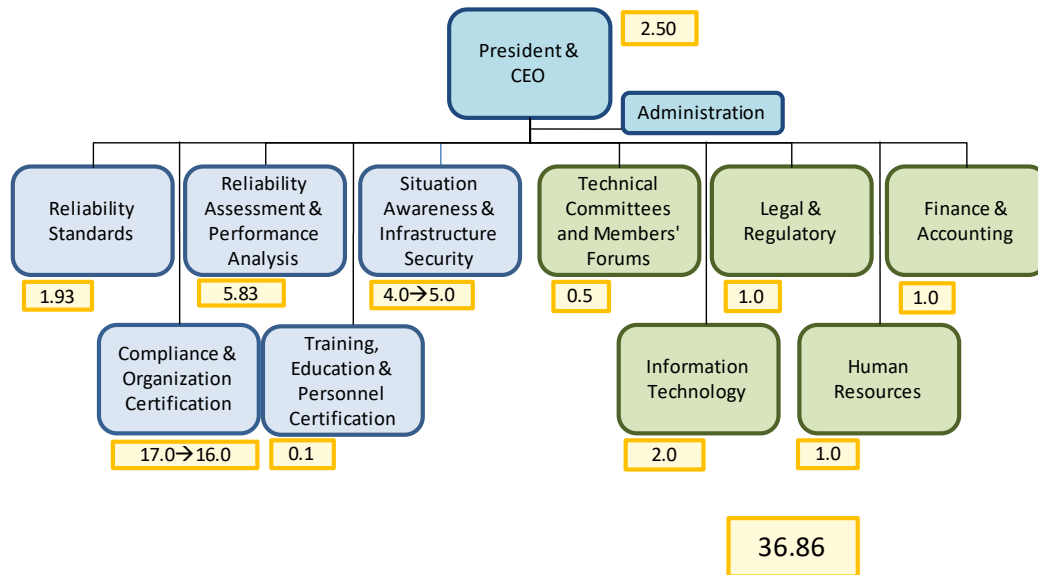
NPCC Statement of Activities 2018 Budget		Criteria Services Total	Criteria Development	Criteria Assessment	General and Administrative
Funding					
ERO Funding					
	ERO Assessments	-			
	Penalty Sanctions	-			
	Total ERO Funding	-	-	-	-
	Membership Dues	1,019,141	521,732	545,251	(47,843)
	Testing Fees	-	-	-	-
	Services & Software	-	-	-	-
	Workshops	-	-	-	-
	Interest	-	-	-	-
	Miscellaneous	-	-	-	-
	Total Funding (A)	1,019,141	521,732	545,251	(47,843)
Expenses					
Personnel Expenses					
	Salaries	404,848	184,971	219,877	-
	Payroll Taxes	23,413	10,915	12,498	-
	Benefits	74,991	41,713	33,278	-
	Retirement Costs	43,272	20,260	23,012	-
	Total Personnel Expenses	546,523	257,858	288,665	-
Meeting Expenses					
	Meetings	5,000	2,500	2,500	-
	Travel	55,647	27,647	28,000	-
	Conference Calls	-	-	-	-
	Total Meeting Expenses	60,647	30,147	30,500	-
Operating Expenses					
	Consultants & Contracts	40,360	24,000	16,360	-
	Office Rent	-	-	-	-
	Office Costs	-	-	-	-
	Professional Services	-	-	-	-
	Miscellaneous	3,000	1,500	1,500	-
	Depreciation	16,000	8,000	8,000	-
	Total Operating Expenses	59,360	33,500	25,860	-
	Total Direct Expenses	666,530	321,505	345,025	-
	Indirect Expenses	416,453	208,227	208,227	-
	Other Non-Operating Expenses	-	-	-	-
	Total Expenses (B)	1,082,983	529,732	553,251	-
	Change in Assets	(63,843)	(8,000)	(8,000)	(47,843)
Fixed Assets					
	Depreciation	(16,000)	(8,000)	(8,000)	-
	Computer & Software CapEx	-	-	-	-
	Furniture & Fixtures CapEx	-	-	-	-
	Equipment CapEx	-	-	-	-
	Leasehold Improvements	-	-	-	-
	Allocation of Fixed Assets	-	-	-	-
	Inc (Dec) in Fixed Assets (C)	(16,000)	(8,000)	(8,000)	-
	TOTAL BUDGET (=B + C)	1,066,983	521,732	545,251	-
	TOTAL CHANGE IN WORKING CAPITAL (=A-B-C)	(47,843)	-	-	(47,843)
	FTEs	2.14	1.07	1.07	0

Appendix A Staff Allocations

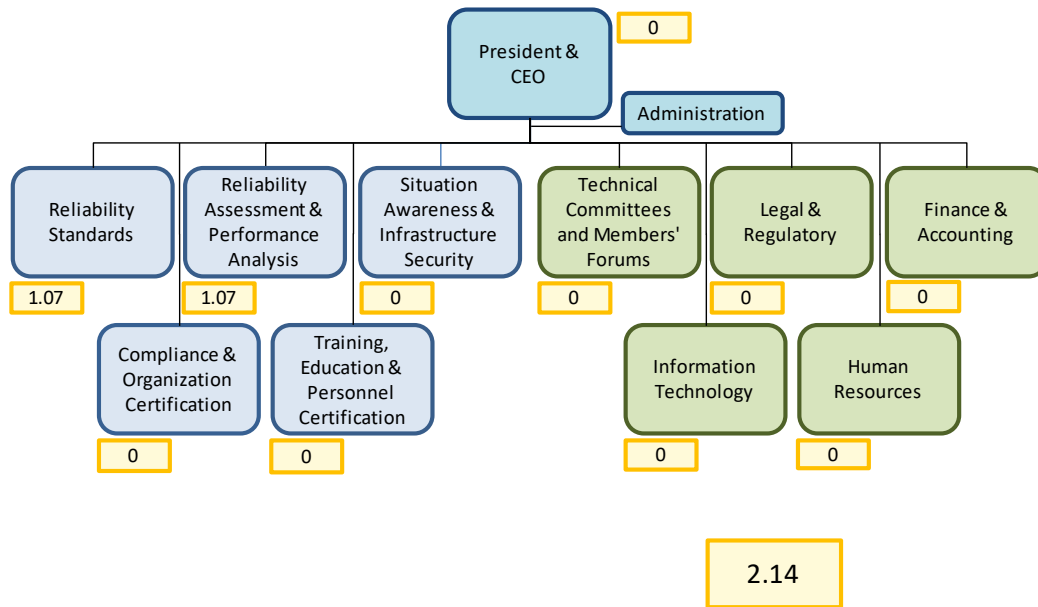
2017 Budget Staff Allocations - RE Division



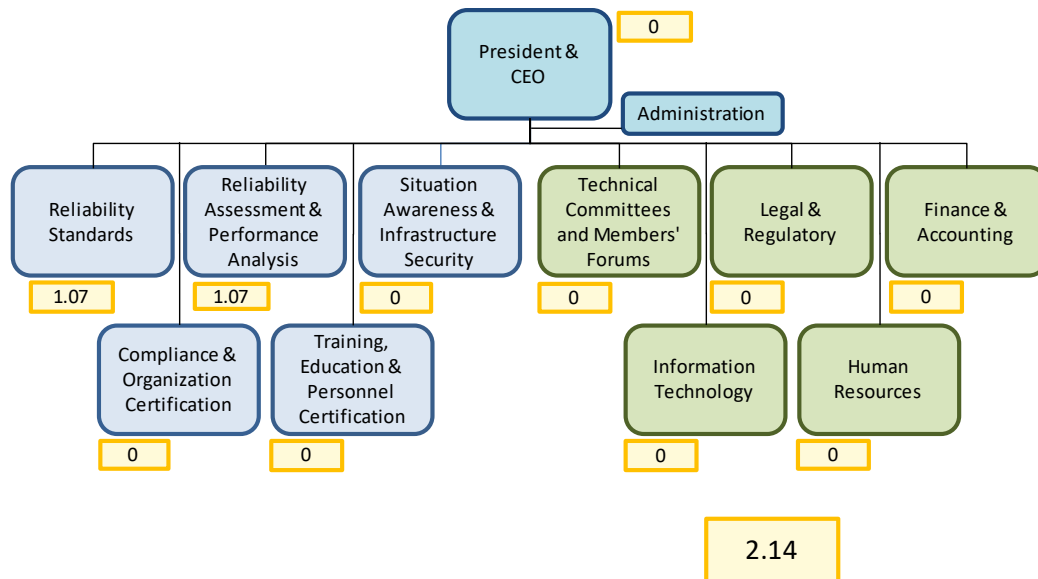
2018 Budget Staff Allocations - RE Division



2017 Budget Staff Allocations - CS Division



2018 Budget Staff Allocations - CS Division



Appendix B Acronyms

This section lists acronyms used in this document.

Acronym	Definition
AI	Audits and Investigations
BAA	Balancing Authority Area
BEPWG	BES Exception Process Working Group
BES	Bulk Electric System
BOT	Board of Trustees
BPS	Bulk Power System
CC	Compliance Committee
CCEP	Criteria Compliance Enforcement Program
CDAA	CMEP Data Administration Application
CEAP	Cost Effective Analysis Process
CEH	Continuing Education Hour
CGNC	Corporate Governance and Nominating Committee
CIPC	Critical Infrastructure Protection Committee
CIPIS	Critical Information Protection Information Sharing
CMEP	Compliance Monitoring and Enforcement Program
CORC	Compliance Monitoring and Enforcement and Organization Registration and Certification Program
CPP	Clean Power Plan
CRRA	Cost of Risk Reduction Analysis
CUG	Consortium Users Group
DADS	Demand Availability Data System
DADSWG	Demand Response Availability Data System Working Group
ERA	Entity Reliability Assessment
ERAG	Eastern Interconnection Reliability Assessment Group
ERO	Electric Reliability Organization
EUB	Electric Utility Board
EUB	Energy and Utilities Board
FAC	Finance and Audit Committee
FERC	Federal Energy Regulatory Commission
FFT	Find, Fix, Track
GADS	Generator Availability Data System
GADSWG	Generating Availability Data System Working Group
GMD	Geomagnetic Disturbance
HQCMÉ	Hydro-Québec Contrôle des mouvements d'énergie
HSIN	Homeland Security Information Network
ICE	Internal Controls Evaluation
IED	Intelligent Electronic Device
IERP	Independent Experts Review Panel Report
IESO	Independent Electricity System Operator
IRA	Inherent Risk Assessment
ISO	Independent System Operator
ITSG	IT Steering Group
LCEFT	Load, Capacity, Energy, Fuels, and Transmission
LMS	Learning Management System
LMWG	Load Modeling Working Group
LSE	Load Serving Entity
MACD	Market Assessment and Compliance Division of the IESO
MDCC	Management Development and Compensation Committee
ME	Mitigation and Enforcement
MMWG	Multi-Regional Modeling Working Group
MOU	Memorandum of Understanding
MPLS	Multiprotocol Label Switching
MVWG	Model Validation Working Group
NAESB	North American Electric Standards Review Board

Section D — Additional Financial Statements

Acronym	Definition
NEL	Net Energy for Load
NERC	North American Electric Reliability Corporation
NOAV	Notice of Alleged Violation
NOCV	Notice of Confirmed Violation
NOPR	Notice of Proposed Rulemaking
NOPV	Notice of Possible Violation
NPCC	Northeast Power Coordinating Council, Inc.
NRAP	NPCC Reliability Assessment program
NSPI	Nova Scotia Power Incorporated
NSUARB	Nova Scotia Utility and Review Board
OEB	Ontario Energy Board
PAS	Performance Analysis Subcommittee
PC	Pension Committee
PMOS	Project Management Oversight Subcommittee
PSMTF	Protection System Mis-operations Task Force
PSTN	Public Switched Telephone Network
QCMEP	Québec Reliability Standards Compliance Monitoring and Enforcement Program
RADS	Reliability Assessment Data System
RADWG	Reliability Assessment Data Working Group
RAS	Reliability Assessment Subcommittee
RC	Reliability Coordinator
RCC	Reliability Coordinating Committee
RISC	Reliability Issues Steering Committee
RSAW	Reliability Standards Audit Worksheet
RSC	Regional Standards Committee
RTO	Regional Transmission Organization
SAFNR	Situational Awareness-FERC, NERC, Regions
SAMS	System Analysis and Modeling Subcommittee
SAR	Standards Authorization Request
SAT	Systematic Approach to Training
SBS	Standards Balloting System
SCPS	Standards Committee Process Subcommittee
SDT	Standards Drafting Team
SEDS	Spare Equipment Database System
SEDTF	Spare Equipment Database Task Force
SPS	Special Protection Systems
TADS	Transmission Availability Data System
TADSWG	Transmission Availability Data System Working Group
TFCO	Task Force on Coordination of Operation
TFCP	Task Force on Coordination of Planning
TFE	Technical Feasibility Exception
TFIST	Task Force on Infrastructure Security and Technology
TFSP	Task Force on System Protection
TFSS	Task Force on System Studies
TLR	Transmission Loading Relief
TOP	Transmission Operator
UFLS	Underfrequency Load Shedding
UVLS	Under-Voltage Load Shedding
VRF	Violation Risk Factor
VSL	Violation Security Level

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**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 4

DISCUSSION OF COMMENTS RECEIVED

DURING DEVELOPMENT OF NERC'S

2018 BUSINESS PLAN AND BUDGET

July 17, 2017

Re: Management Response to Comments Received

The deadline for comments on the first draft of NERC's 2018 Business Plan and Budget (BP&B) ended on June 30, 2017. Comments were submitted by seven individuals and entities and covered a wide range of topics. Below is a summary of those comments and NERC management's response.

E-ISAC Member Executive Committee (MEC)¹

The MEC, comprised of the leadership of several large electric utilities across the country, provided a resolution in support of the E-ISAC strategy. This long-term strategy was included in Exhibit F of the first draft of NERC's BP&B, but associated costs were not included in the budget and feedback was solicited. The MEC provided a resolution that urged NERC to move forward with a "sense of urgency" and offered support for the proposed 2018 additional costs associated with the strategy.

NERC management received additional informal feedback from other stakeholders in support of this strategy, and management has included the proposed 2018 additional costs in the latest draft of NERC's BP&B.

Bonneville Power Administration (BPA)

BPA offered support and comments on the five strategic goals of the ERO Enterprise discussed in the BP&B. The comments were generally supportive and BPA encouraged NERC to continue their communication and outreach. NERC management agrees, welcomes the support and assistance of BPA, and will continue efforts to include industry stakeholders in the strategic goal and operating plan process.

Mr. David Bardin

Mr. Bardin provided comments on the FERC order related to Geomagnetic Disturbances (GMD) and NERC's plans for the research. As noted in the first draft of the BP&B, FERC directed NERC to submit a research work plan describing how NERC will conduct research into the specific GMD-related topics identified in the order. On May 30, 2017, NERC filed its preliminary GMD research work plan. In this preliminary plan, NERC identified various tasks that would build upon existing research, but noted that much work remains to be done to develop an optimal project management framework for this GMD research. In light of this approach, NERC included only minimal costs for the GMD research in the first draft of the BP&B. Mr. Bardin requested

¹ The MEC is a sub-group of the Electricity Subsector Coordinating Council (ESCC). For more information, please see the ESCC website [here](#).

that NERC reconsider this approach and add additional funds to support a more comprehensive research plan. He provided some additional details related to his request.

Management appreciates the feedback, but continues our current approach to address these additional steps. NERC plans to conduct extensive outreach over the coming months with government agencies, academia, the Electric Power Research Institute, stakeholders, and others to identify opportunities for research synergies, develop an appropriate research management structure, and discuss ways to fund the project, including seeking outside funding resources. As Mr. Bardin notes, FERC may also provide further guidance or direction with respect to the specific GMD research activities included in the plan. This could include adding, eliminating, or prioritizing specific project activities. Each of these considerations would inform the final project plan and ultimately the final estimate of the total and year-over-year costs that would be borne by NERC and therefore be reflected in NERC's budgets. Given the current uncertainties, management still plans to make the 2018 GMD-related budget decisions after exploring stakeholder co-funding options and FERC review of the GMD research plan.

ISO / RTO Council – Standards Review Committee (SRC)

The SRC comments were primarily related to NERC's Reliability Standards program area. In particular, the SRC urged NERC to reduce reliance on continual standards revisions and development, focus efforts on risk identification, and explore ways to collect and analyze data regarding the effectiveness of standards. The SRC provided additional specific feedback on various areas of the BP&B.

NERC management agrees that the initiative on steady state in standards development and the move to Risk-Based Compliance Monitoring have brought much needed clarity and efficiencies in the understanding and enforcement of standards. However, the ongoing risks of physical and cyber security, coupled with the reliability risks of distributed energy resources, demonstrate the need for continued resources in standards development. We agree that not all of the solutions may exist in a standard, and that the Standards Committee will continue to work closely with the technical committees to address these risks with a standard solution when other solutions are not feasible. NERC is also committed to ongoing reviews of the standards to eliminate requirements unnecessary for reliability, and look for potential cost savings in implementation.

National Rural Electric Cooperative Association (NRECA)

The NRECA provided three comments related to efficiency and cost control, use of assessment stabilization reserves, and clarity on personnel costs and reasonableness. NERC management added additional language to the BP&B document to address some of these comments.

Canadian Electricity Association (CEA) and Independent Electricity System Operator (IESO)

The CEA and IESO, both Canadian entities, provided similar comments related to ongoing efficiency and cost control. Both organizations urged NERC to continually focus on maximizing efficiency and work to achieve budget increases that more closely align with utility and inflationary realities.

NERC management agrees that ongoing efficiency and cost control are an integral part of the ERO Enterprise long-term strategy. The 2018 BP&B is relatively stable, excluding the added costs associated with the E-ISAC

strategy. And the ERO Enterprise as a whole is experiencing some stability in recent years and looking into the next 2-3 years. We expect the efficiency goals and maturity of the ERO Enterprise will provide budgetary stability in the coming years. Improving the efficiency and effectiveness of the ERO Enterprise operations is one of the recommended focus areas included in NERC's draft long-term strategy which will be posted this week for stakeholder comment, and further reviewed at the August 2017 Members Representative Committee meeting.

We appreciate the comments received and encourage your continued participation in the BP&B process.

Sincerely,

Scott Jones

Vice President of Finance
Treasurer

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 5

**CALCULATION OF ADJUSTMENTS
THE AESO 2018 NERC ASSESSMENT,
THE IESO 2018 NERC ASSESSMENT,
THE NEW BRUNSWICK 2018 NERC ASSESSMENT,
AND THE QUEBEC 2018 NERC ASSESSMENT**

2018 AESO Assessment Adjustment

Credit for NERC Compliance Costs

Includes adjustment for 2016 Actual v Budgeted Costs

	AESO NEL Share		2018 Compliance FTEs			Costs Paid by	
	2018 NERC Budget	(2016) 1.311%	Total	Credit	% Credit	AESO Credit	AESO
NERC Compliance Program Budget							
Compliance Assurance	\$ 8,890,790	\$ 116,558	19.27	17.77	92.2%	\$ 107,467	\$ 9,092
Analysis and Certification	4,880,587	63,985	9.40	8.38	89.1%	57,042	6,943
Enforcement	6,665,495	87,385	12.22	12.22	100.0%	87,385	-
Total Compliance Costs, including Fixed Assets	\$ 20,436,872	\$ 267,928	40.89	38.37		\$ 251,893	\$ 16,035
Additional Compliance Costs (Not Budgeted in Compliance)							
2018 CMEP Database Support	161,000	2,111			100.0%	2,111	-
True-up 2016 Actual						(25,358)	
Additional Non-Compliance Costs							
Event Analysis	5,113,695	67,041	11.28	3.38	30.0%	20,112	46,928
SAFNR	523,900	6,868			100.0%	6,868	
Total Compliance, Event Analysis and SAFNR	\$ 26,235,467	\$ 343,948	52.17	41.75		\$ 255,627	\$ 62,963
2017	\$ 23,418,441	\$ 324,814	47.47	38.67		\$ 300,599	\$ 59,341
Change from 2017	\$ 2,817,026					\$ (44,972)	\$ 3,622
2018 Assessment							
2018 NERC Assessment	\$ 578,600						
2018 RE Assessment	979,700						
Total 2018 Assessment	\$ 1,558,299						
2017 Assessment							
2017 NERC Assessment	\$ 544,658						
2017 RE Assessment	990,964						
Total 2017 Assessment	\$ 1,535,622						
Change in Total Assessment	\$ 22,677						
		1.5%					

2018 IESO Assessment Adjustment

Credit for NERC Compliance Costs

Includes adjustment for 2016 Actual v Budgeted Costs

	NERC Budget		IESO NEL Share (2016) 3.040%	2018 Compliance FTEs			Costs Paid by	
				Total	Credit	% Credit	IESO Credit	IESO
NERC Compliance Program Budget								
Compliance Assurance	\$	8,890,790	\$ 270,241	19.27	16.03	83.2%	\$ 224,841	\$ 45,401
Analysis and Certification		4,880,587	148,349	9.40	8.38	89.1%	132,251	16,097
Enforcement		6,665,495	202,602	12.22	12.22	100.0%	202,602	-
Total Compliance Costs, including Fixed Assets	\$	20,436,872	\$ 621,192	40.89	36.63		\$ 559,694	\$ 61,498
Additional Compliance Costs (Not Budgeted in Compliance)								
2018 CMEP Database Support		161,000	4,894			100.0%	4,894	-
True-up 2016 Actual							(54,191)	
Additional Non-Compliance Costs								
Event Analysis		5,113,695	\$ 155,434	11.28	3.38	30.0%	\$ 46,575	\$ 108,859
SAFNR		523,900	15,924			100.0%	15,924	-
Total Compliance, Event Analysis and SAFNR	\$	26,235,467	\$ 797,444	52.17	40.01		\$ 572,896	\$ 170,357
2017	\$	23,418,441	\$ 710,750	47.47	37.27		\$ 637,044	\$ 151,378
Change from 2017	\$	2,817,026	\$ 86,694				\$ (64,148)	\$ 18,979
2018 Assessment								
2018 NERC Assessment	\$	1,361,261						
2018 RE Assessment		2,074,231						
Total 2018 Assessment	\$	3,435,491						
2017 Assessment								
2017 NERC Assessment	\$	1,212,884						
2017 RE Assessment		2,011,235						
Total 2017 Assessment	\$	3,224,119						
Change in Total Assessment	\$	211,372						
		6.6%						

2018 New Brunswick Assessment Adjustment

Credit for NERC Compliance Costs

Includes adjustment for 2016 Actual v Budgeted Costs

	NERC Budget	NB NEL Share (2016) 0.304%	2018 Compliance FTEs			NB Credit	Costs Paid by	
			Total	Credit	% Credit		NB	
NERC Compliance Program Budget								
Compliance Assurance	\$ 8,890,790	\$ 27,022	19.27	16.03	83.2%	\$ 22,482	\$	4,540
Analysis and Certification	4,880,587	14,834	9.40	8.38	89.1%	13,224		1,610
Enforcement	6,665,495	20,259	12.22	12.22	100.0%	20,259		-
Total Compliance Costs, including Fixed Assets	\$ 20,436,872	\$ 62,115	40.89	36.63		\$ 55,965	\$	6,149

Additional Compliance Costs (Not Budgeted in Compliance)

2018 CMEP Database Support	161,000	489			100.0%	489		-
True-up 2016 Actual						(5,416)		

Additional Non-Compliance Costs

Event Analysis	5,113,695	15,542	11.28	3.38	30.0%	\$ 4,657	\$	10,885
SAFNR	523,900	1,592			100.0%	1,592		
Total Compliance, Event Analysis and SAFNR	\$ 26,235,467	\$ 79,739	52.17	40.01		\$ 57,288	\$	17,034
2017	\$ 23,418,441	\$ 73,653	47.47	37.27		\$ 66,129	\$	15,687
Change from 2017	\$ 2,817,026					\$ (8,841)	\$	1,347

2018 Assessment

2018 NERC Assessment	\$ 136,114
2018 RE Assessment	288,998
Total 2018 Assessment	\$ 425,112

2017 Assessment

2017 NERC Assessment	\$ 125,585
2017 RE Assessment	290,905
Total 2017 Assessment	\$ 416,490

Change in Total Assessment	\$ 8,622	2.1%
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2018 Quebec Assessment Adjustment
Credit for NERC Compliance Costs
Includes adjustment for 2016 Actual v Budget

	NERC Budget	Quebec NEL	2018 Compliance FTEs			Quebec	Costs Paid by	Payment Allocation	
		Share (2016)	Total	Credit	% Credit	Credit	Quebec	Regie	Hydro Quebec
NERC Compliance Program Budget - 2018		4.039%							
Compliance Assurance	\$ 8,890,790	\$ 359,114	19.27	6.94	36.0%	\$ 129,281	\$ 229,833		\$ 229,833
Analysis and Certification	4,880,587	197,135	9.40	8.38	89.1%	175,744	21,391	\$ 18,750	2,642
Enforcement	6,665,495	269,230	12.22	12.22	100.0%	269,230	-		
Total Compliance Costs, including Fixed Assets	\$ 20,436,872	\$ 825,479	40.89	27.54		\$ 574,255	\$ 251,224	\$ 18,750	\$ 232,474
Additional Compliance Costs (Not Budgeted in Compliance)									
2018 CMEP Database Support	161,000	6,503			100.0%	6,503			
True-up 2016 Actual						(51,620)			
Additional Non-Compliance Costs									
Event Analysis	5,113,695	206,551	11.28	3.38	30.0%	\$ 61,892	\$ 144,659		\$ 144,659
SAFNR	523,900	21,161			100.0%	21,161			
Total Compliance, Event Analysis and SAFNR	\$ 26,235,467	\$ 1,059,694	52.17	30.92		\$ 612,191	\$ 395,883	\$ 18,750	\$ 377,133
2017 Budget	\$ 23,418,441	\$ 957,713	47.47	29.96		\$ 689,561	\$ 355,581	\$ 16,260	\$ 339,321
Change from 2017	\$ 2,817,026					\$ (77,370)	\$ 40,302	\$ 2,490	\$ 37,812
2018 Assessment (including Compliance credit)									
2018 NERC Assessment	\$ 1,958,039							\$ 18,750	\$ 1,939,289
2018 RE Assessment	2,985,158							1,050,695	1,934,463
Total 2018 Assessment	\$ 4,943,197							\$ 1,069,445	\$ 3,873,752
2017 Assessment (including Compliance Credit)									
2017 NERC Assessment	\$ 1,803,289							\$ 16,260	\$ 1,787,029
2017 RE Assessment	2,820,434							1,027,171	1,793,263
Total 2017 Assessment	\$ 4,623,723							\$ 1,043,431	\$ 3,580,292
Change in Total Assessment	\$ 319,474							\$ 26,014	\$ 293,460
	6.9%							2.5%	8.2%

**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 6

**METRICS COMPARING
REGIONAL ENTITY OPERATIONS
BASED ON
THE 2018 BUDGETS**

2018 Metrics for Budget Submissions

	Budget Metrics	FRCC	MRO	NPCC ⁵	ReliabilityFirst	SERC	SPP RE	Texas RE	WECC
1	Number of registered entities	42	113	205	230	192	120	203	366
2	Number of registered functions	163	342	427	477	507	315	379	888
3	Total NEL (GWh)	234,140	289,292	628,864	894,287	1,022,554	227,489	353,022	857,250
4	NEL (GWh) per registered entity	5,575	2,560	3,068	3,888	5,326	1,896	1,739	2,342
5	Total ERO Funding ¹	\$ 6,913,663	\$ 10,872,104	\$ 14,416,787	\$ 22,060,585	\$ 17,933,114	\$ 10,017,265	\$ 11,546,986	\$ 27,382,000
6	ERO Funding per registered entity	\$ 164,611	\$ 96,213	\$ 70,326	\$ 95,916	\$ 93,402	\$ 83,477	\$ 56,882	\$ 74,814
7	ERO Funding per registered function	\$ 42,415	\$ 31,790	\$ 33,763	\$ 46,249	\$ 35,371	\$ 31,801	\$ 30,467	\$ 30,836
8	Total Budget ²	\$ 7,514,112	\$ 11,726,738	\$ 15,106,967	\$ 21,393,899	\$ 17,182,868	\$ 10,793,195	\$ 12,656,953	\$ 27,097,344
9	Total Budget per registered entity	\$ 178,907	\$ 103,776	\$ 73,693	\$ 93,017	\$ 89,494	\$ 89,943	\$ 62,350	\$ 74,036
10	Total Budget per registered function	46098.84663	\$ 34,289	\$ 35,379	\$ 44,851	\$ 33,891	\$ 34,264	\$ 33,396	\$ 30,515
11	Total Statutory FTE ³	30.63	45.00	36.86	76.20	75.00	32.30	60.00	143.00
12	Registered entity per Statutory FTE	1.371	2.511	5.562	3.018	2.560	3.715	3.383	2.559
13	Registered function per Statutory FTE	5.322	7.600	11.584	6.260	6.760	9.752	6.317	6.210
14	Total Compliance Budget ⁴	\$ 5,498,173	\$ 7,756,470	\$ 8,293,748	\$ 15,960,112	\$ 12,171,991	\$ 8,466,710	\$ 9,593,152	\$ 14,643,677
15	Compliance budget per registered entity	\$ 130,909	\$ 68,641	\$ 40,457	\$ 69,392	\$ 63,396	\$ 70,556	\$ 47,257	\$ 40,010
16	Compliance budget per registered function	\$ 33,731	\$ 22,680	\$ 19,423	\$ 33,459	\$ 24,008	\$ 26,878	\$ 25,312	\$ 16,491
17	Total Compliance FTE ³	19.65	23.02	16.00	45.25	32.56	21.75	36.25	59.00
18	Registered entity per Compliance FTE	2.1	4.9	12.8	5.1	5.9	5.5	5.6	6.2
19	Registered function per Compliance FTE	8.3	14.9	26.7	10.5	15.6	14.5	10.5	15.1

¹ ERO Funding is the sum of Assessments and Penalty Sanctions only. (Excludes funding, such as Membership Dues, Testing Fees, Services & Software, Workshops, Interest, and Miscellaneous.)

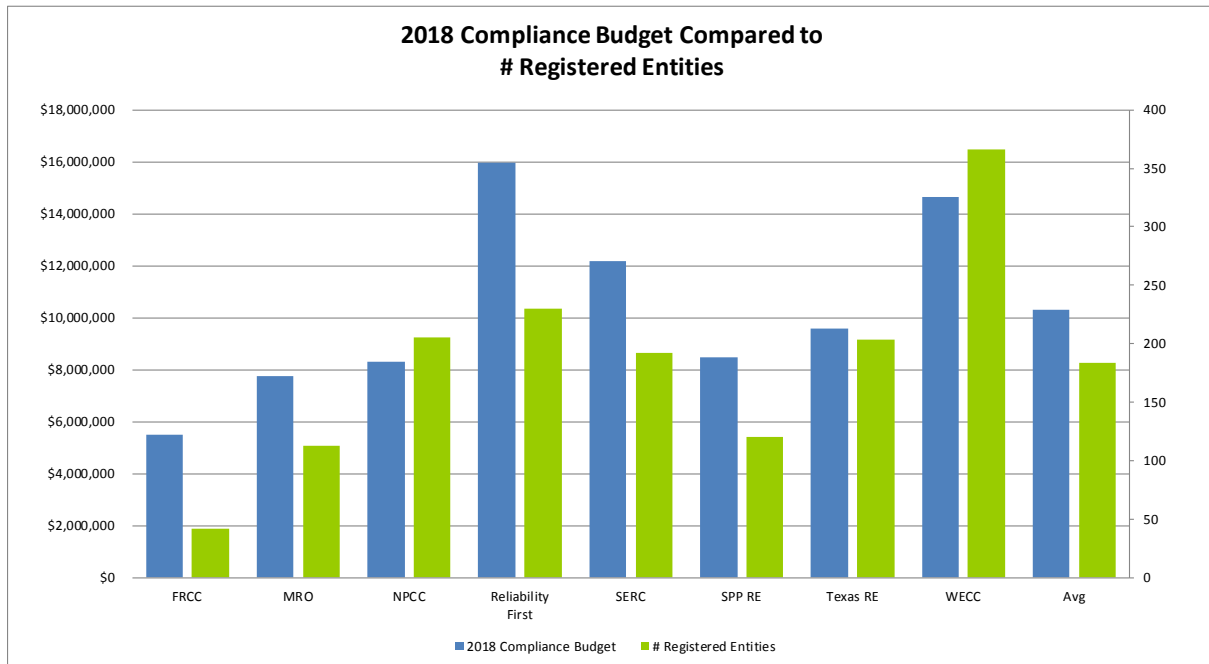
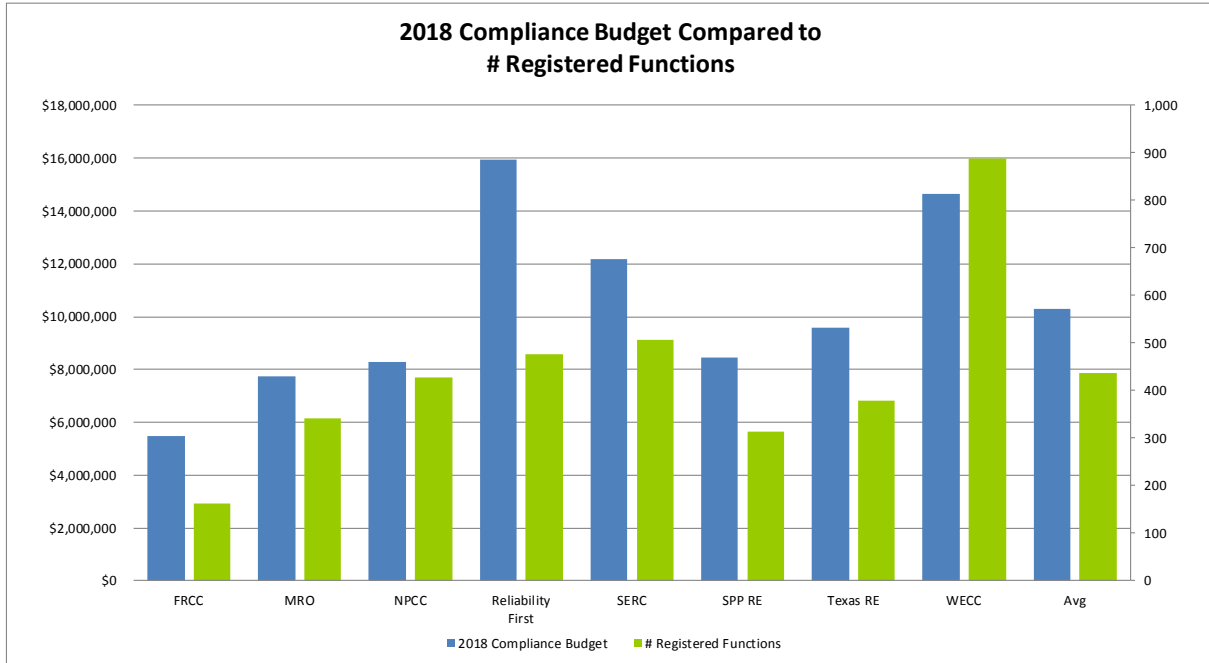
² Total Budget is the sum of Total Expenses and the Increase/(Decrease) in Fixed Assets.

³ Each FTE that works 2,080 hours per year is counted as one FTE. An FTE working less than the 2,080 hours per year is counted as a fractional FTE.

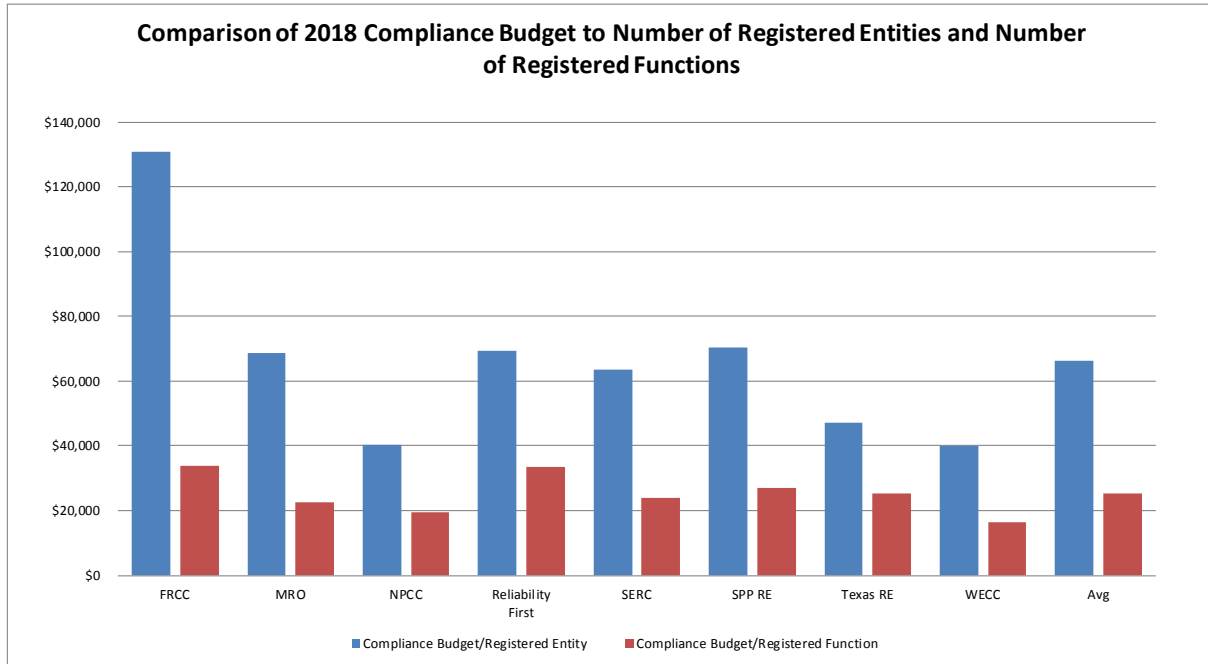
⁴ Total Compliance Budget is a sum of Direct Expenses, Indirect Expenses, and Capital Expenditures.

⁵ Due to the specifics of the compliance program included in the individual provincial MOUs for cross-border regional entities, some of these metrics are not directly comparable.

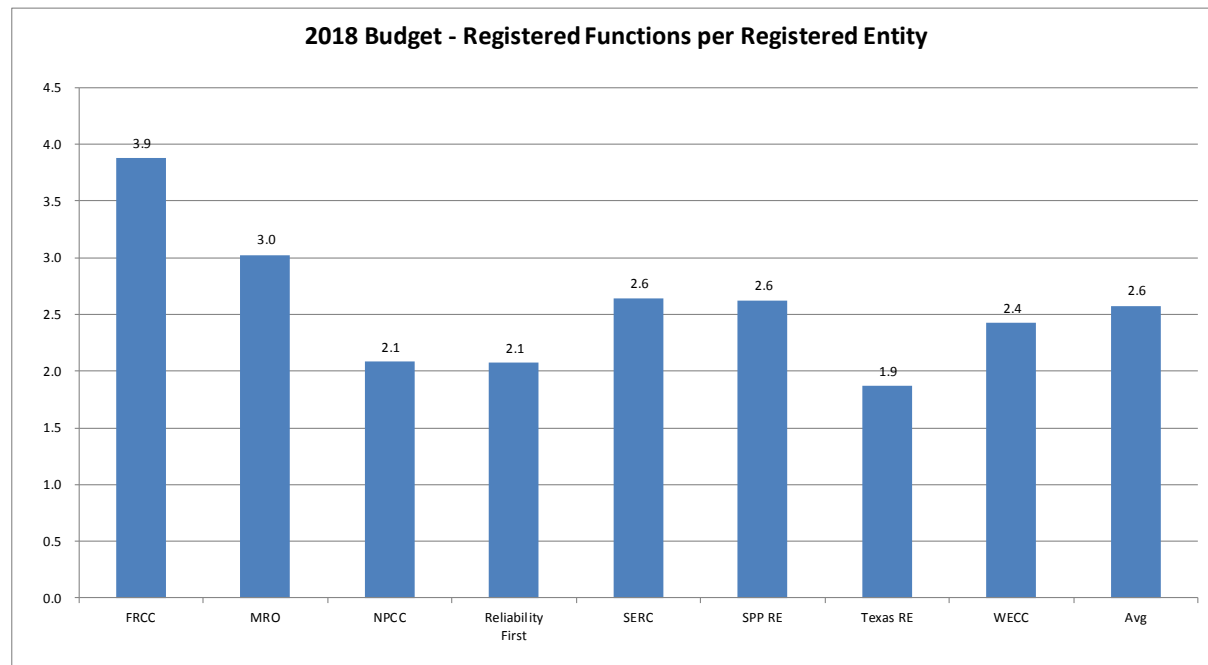
	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
2018 Compliance Budget	\$5,498,173	\$7,756,470	\$8,293,748	\$15,960,112	\$12,171,991	\$8,466,710	\$9,593,152	\$14,643,677	\$10,298,004
# Registered Entities	42	113	205	230	192	120	203	366	184
# Registered Functions	163	342	427	477	507	315	379	888	437



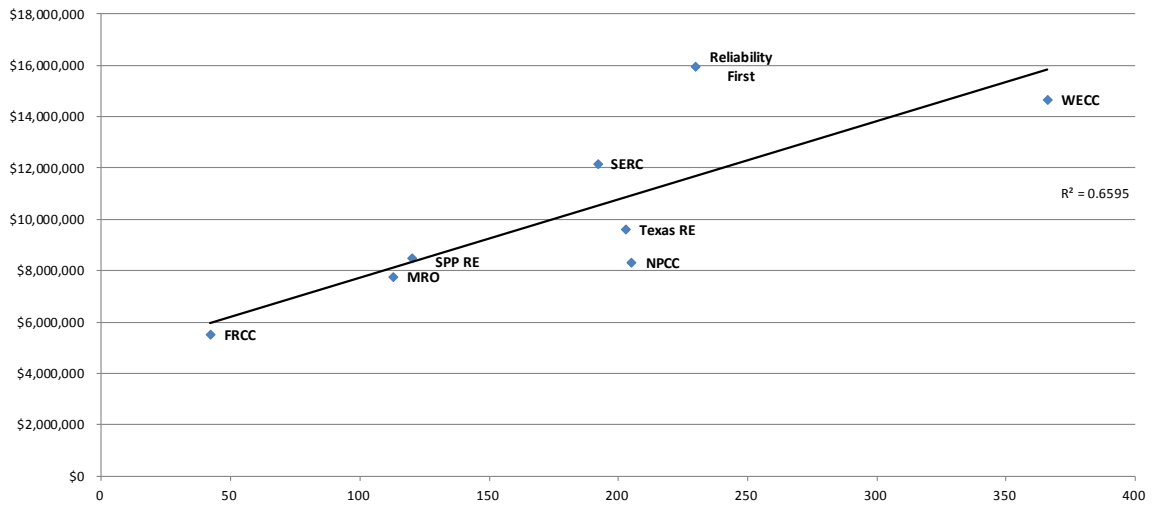
	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
Compliance Budget/Registered Entity	\$130,909	\$68,641	\$40,457	\$69,392	\$63,396	\$70,556	\$47,257	\$40,010	\$66,327
Compliance Budget/Registered Function	\$33,731	\$22,680	\$19,423	\$33,459	\$24,008	\$26,878	\$25,312	\$16,491	\$25,248



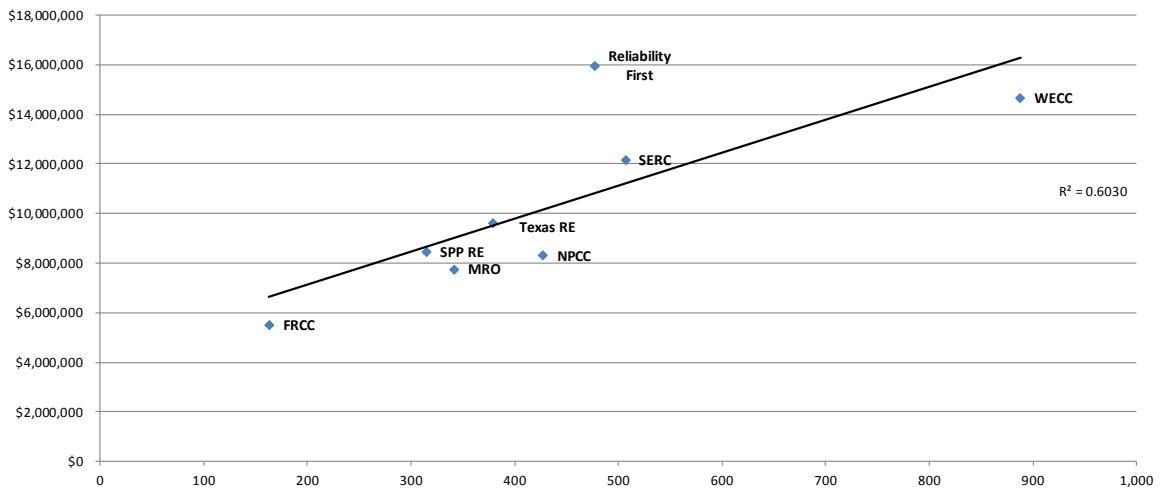
	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
Registered Functions per Registered Entity 2018 Budget	3.9	3.0	2.1	2.1	2.6	2.6	1.9	2.4	2.6



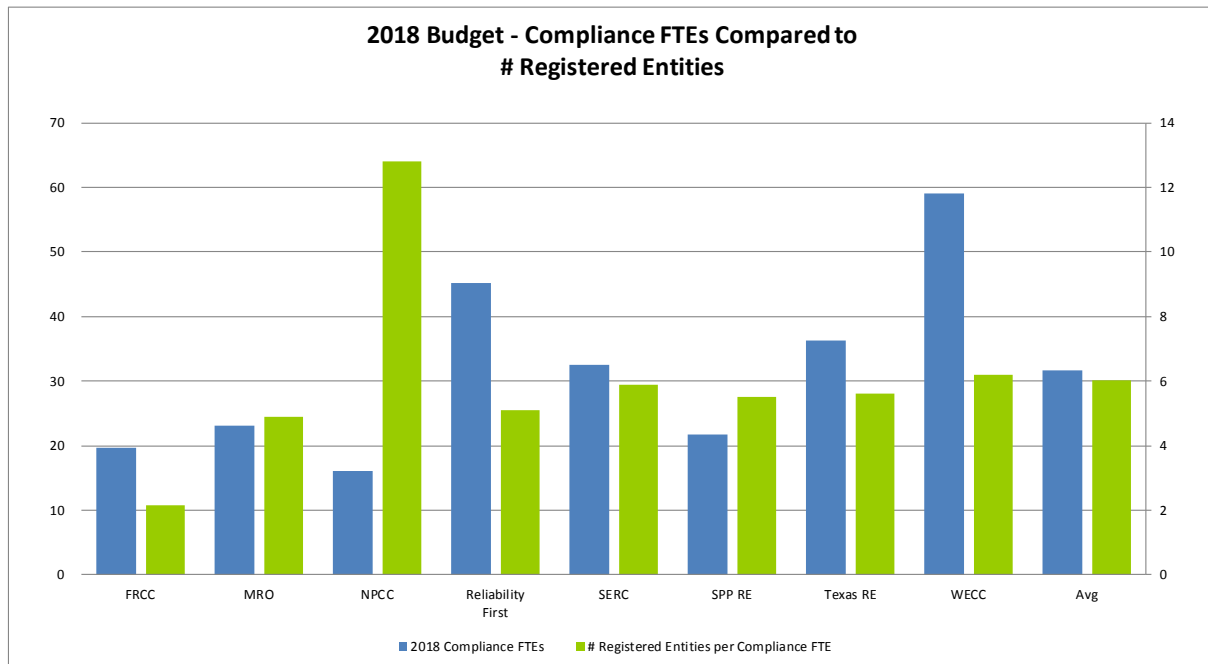
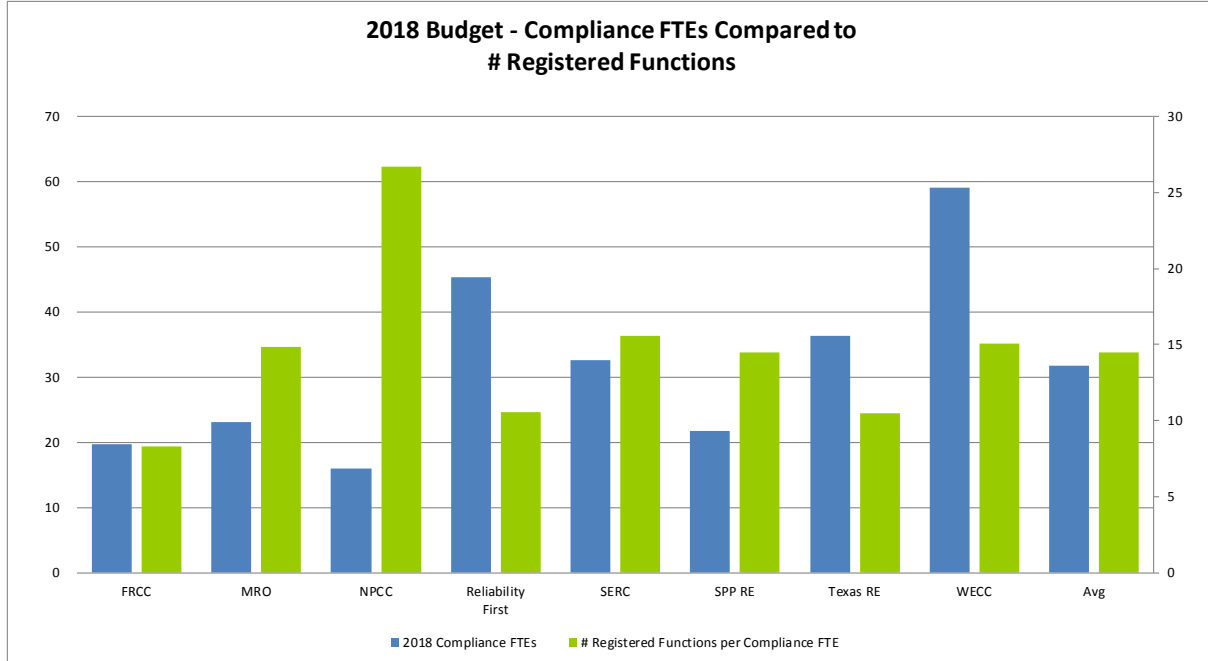
Regional Entity 2018 Compliance Program Budget as Function of Number of Registered Entities



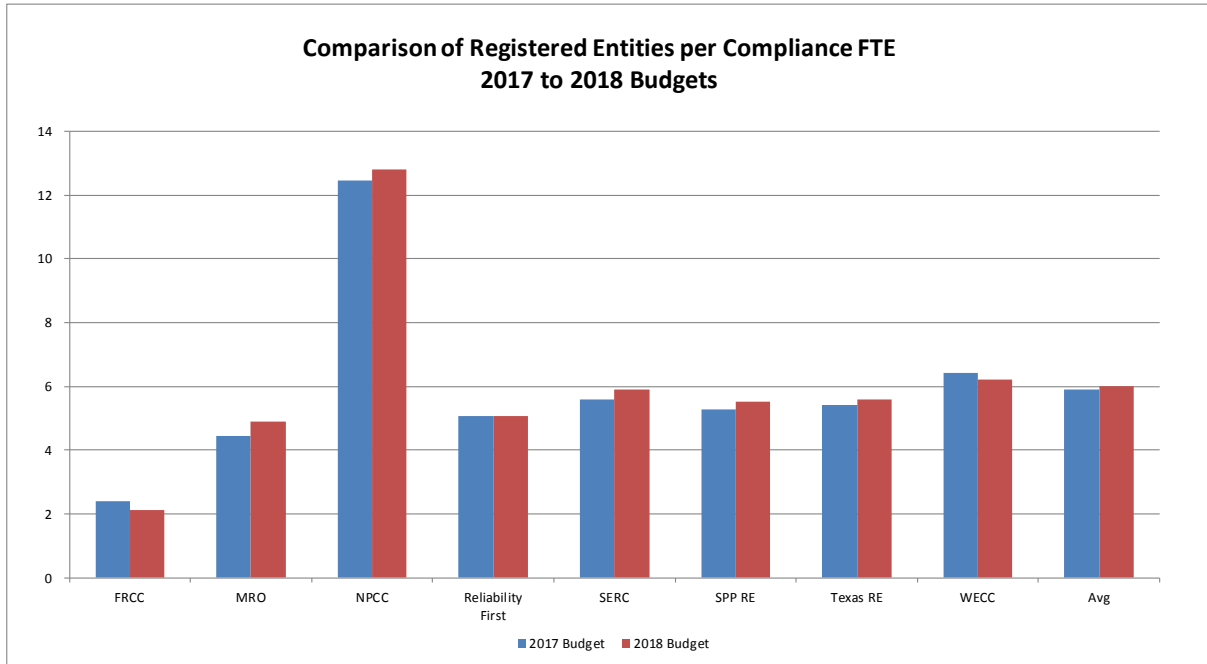
Regional Entity 2018 Compliance Program Budget as Function of Number of Registered Functions



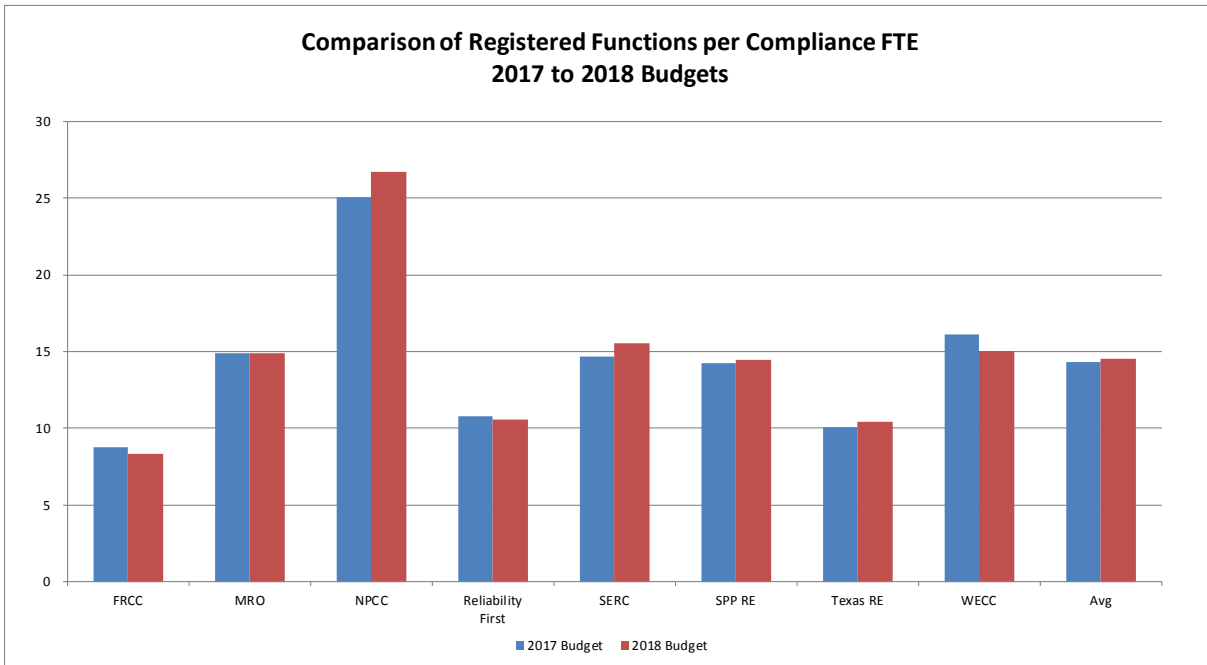
	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
2018 Compliance FTEs	19.65	23.02	16.00	45.25	32.56	21.75	36.25	59.00	31.69
# Registered Entities per Compliance FTE	2.1	4.9	12.8	5.1	5.9	5.5	5.6	6.2	6.0
# Registered Functions per Compliance FTE	8.3	14.9	26.7	10.5	15.6	14.5	10.5	15.1	14.5



	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
2017 Budget	2.4	4.5	12.5	5.1	5.6	5.3	5.4	6.4	5.9
2018 Budget	2.1	4.9	12.8	5.1	5.9	5.5	5.6	6.2	6.0



	FRCC	MRO	NPCC	Reliability First	SERC	SPP RE	Texas RE	WECC	Avg
2017 Budget	8.7	14.9	25.1	10.7	14.7	14.3	10.0	16.1	14.3
2018 Budget	8.3	14.9	26.7	10.5	15.6	14.5	10.5	15.1	14.5



**NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION**

2018 BUSINESS PLAN AND BUDGET FILING

ATTACHMENT 7

METRICS ON NERC AND REGIONAL ENTITY

ADMINISTRATIVE (INDIRECT) COSTS

BASED ON

THE 2017 AND 2018 BUDGETS

**Analysis of Indirect (Administrative Services) Costs
2018 Budget versus 2017 Budget**

2017 BUDGET					2018 BUDGET					
Total Statutory Budget	Total Statutory Direct Budget	Total Statutory Indirect Budget	% Statutory Indirect Budget to Total Statutory Budget	Ratio of Statutory Direct Budget to Indirect Budget		Total Statutory Budget	Total Statutory Direct Budget	Total Statutory Indirect Budget	% Statutory Indirect Budget to Total Statutory Budget	Ratio of Statutory Direct Budget to Indirect Budget
\$ 69,602,175	\$ 38,187,340	\$ 31,414,835	45.1%	1.22	NERC	\$ 73,135,156	\$ 43,145,222	\$ 29,989,934	41.0%	1.44
7,177,854	6,311,736	866,118	12.1%	7.29	FRCC	7,514,112	6,506,605	1,007,507	13.4%	6.46
11,226,668	6,786,617	4,440,051	39.5%	1.53	MRO	11,726,736	7,272,018	4,454,718	38.0%	1.63
15,147,054	9,700,335	5,446,719	36.0%	1.78	NPCC	15,106,967	9,684,689	5,422,278	35.9%	1.79
19,908,939	14,170,620	5,738,319	28.8%	2.47	RF	21,393,899	15,185,134	6,208,764	29.0%	2.45
17,482,403	9,305,229	8,177,174	46.8%	1.14	SERC	17,182,868	8,884,242	8,298,626	48.3%	1.07
10,865,511	5,799,846	5,065,665	46.6%	1.14	SPP RE	10,793,195	5,786,488	5,006,707	46.4%	1.16
12,167,256	7,491,452	4,675,804	38.4%	1.60	Texas RE	12,656,953	8,007,811	4,649,142	36.7%	1.72
\$ 26,796,927	\$ 17,029,827	\$ 9,767,100	36.4%	1.74	WECC	\$ 27,097,344	\$ 17,924,467	\$ 9,172,877	33.9%	1.95
			36.6%	2.21	AVERAGE				35.8%	2.18

2017 BUDGETED FTEs					2018 BUDGETED FTEs					
Total Statutory FTEs	Total Statutory Direct FTEs	Total Statutory Indirect FTEs	Indirect FTE as % of Total FTE	# Direct to Indirect Statutory FTEs		Total Statutory FTEs	Total Statutory Direct FTEs	Total Statutory Indirect FTEs	Indirect FTE as % of Total FTE	# Direct to Indirect Statutory FTEs
189.88	120.56	69.33	36.5%	1.74	NERC	199.28	131.84	67.44	33.8%	1.95
29.99	25.80	4.19	14.0%	6.16	FRCC	30.63	26.01	4.62	15.1%	5.63
43.00	31.33	11.67	27.1%	2.68	MRO	45.00	33.59	11.41	25.4%	2.94
36.86	28.86	8.00	21.7%	3.61	NPCC	36.86	28.86	8.00	21.7%	3.61
72.30	57.60	14.70	20.3%	3.92	RF	76.20	60.60	15.60	20.5%	3.88
75.00	49.70	25.30	33.7%	1.96	SERC	75.00	44.70	30.30	40.4%	1.48
33.25	28.75	4.50	13.5%	6.39	SPP RE	32.30	27.80	4.50	13.9%	6.18
60.00	46.25	13.75	22.9%	3.36	Texas RE	60.00	46.25	13.75	22.9%	3.36
140.00	97.00	43.00	30.7%	2.26	WECC	143.00	102.30	40.70	28.5%	2.51
			24.5%	3.56	AVERAGE				24.7%	3.51