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## I. INTRODUCTION

The North American Electric Reliability Corporation (“NERC”)<sup>1</sup> hereby provides the 2012 Annual Report on Wide-Area Analysis of Technical Feasibility Exceptions (“TFEs”) in compliance with Paragraphs 220 and 221 of the Federal Energy Regulatory Commission’s (“FERC” or “Commission”) Order No. 706,<sup>2</sup> FERC’s January 21, 2010 Order Approving TFE Procedures and Ordering Compliance Filing,<sup>3</sup> and Appendix 4D of the NERC Rules of Procedure.

In Order No. 706, NERC was directed to submit an annual report to the Commission that provides a wide-area analysis of the use of the TFEs (an “Annual Report”) and the effect on Bulk-Power System reliability. In the January 21 Order, the Commission renewed its directive and ordered NERC to modify Appendix 4D of the NERC Rules of Procedure to direct the inclusion of specific criteria in the Annual Report. Appendix 4D of the NERC Rules of Procedure requires NERC to submit Annual Reports at one year intervals.

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<sup>1</sup> The Federal Energy Regulatory Commission (“FERC” or “Commission”) certified NERC as the electric reliability organization (“ERO”) in its order issued on July 20, 2006 in Docket No. RR06-1-000. *North American Electric Reliability Corporation*, “Order Certifying North American Electric Reliability Corporation as the Electric Reliability Organization and Ordering Compliance Filing,” 116 FERC ¶ 61,062 (July 20, 2006).

<sup>2</sup> Mandatory Reliability Standards for Critical Infrastructure Protection, 122 FERC ¶ 61,040 (January 18, 2008) (“Order No. 706”).

<sup>3</sup> *Order Approving Technical Feasibility Exception Procedures and Ordering Compliance Filing*, 130 FERC ¶61,050 (January 21, 2010) (“January 21 Order”).

## II. NOTICES AND COMMUNICATIONS

Notices and communications with respect to this filing may be addressed to:

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## III. DISCUSSION

### A. Background

In Order No. 706, FERC approved eight Critical Infrastructure Protection (“CIP”) Reliability Standards and directed NERC to develop a set of conditions or criteria that a Responsible Entity must follow when relying on a TFE contained in a specific Requirement of the CIP Reliability Standards.<sup>4</sup> The criteria to determine a TFE are based on “long-life equipment in place that is not readily compatible with a modern environment where cyber security issues are an acknowledged concern.”<sup>5</sup>

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<sup>4</sup> *Mandatory Reliability Standards for Critical Infrastructure Protection*, 122 FERC ¶ 61,040 at P 178 (January 18, 2008) (“Order No. 706”).

<sup>5</sup> *Id.* at P 180.

Order No. 706 requires that an Annual Report be submitted on the use of TFEs. The order states:

The annual report must address, at a minimum, the frequency of the use of such provisions, the circumstances or justifications that prompt their use, the interim mitigation measures used to address vulnerabilities, and efforts to eliminate future reliance on the exception. . . [T]he report should contain aggregated data with sufficient detail for the Commission to understand the frequency with which specific provisions are being invoked as well as high level data regarding mitigation and remediation plans over time and by region . . . .<sup>6</sup>

The criteria for the Annual Report are outlined in Sections 11.2.4 and 13 of Appendix 4D. Each of these criteria are addressed below.

### **B. Annual Report**

In accordance with Appendix 4D of the NERC Rules of Procedure, Regional Entities submit confidential quarterly reports to NERC regarding the types of Covered Assets for which TFE Requests are approved. In addition to providing quarterly reports, each Regional Entity submitted responses to the eight criteria identified in Section 13 of Appendix 4D to be included in the Annual Report. NERC has compiled and analyzed the TFE data provided by the Regional Entities in preparation for this Annual Report.

The following is a summary of the TFE data reported by each Regional Entity for the eight criteria.

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<sup>6</sup> *Id.* at P 220.

1. *Criterion (i): The frequency of use of the TFE Request process, disaggregated by Regional Entity and in the aggregate for the United States and for the jurisdictions of other Applicable Governmental Authorities, including (A) the numbers of TFE Requests that have been submitted, accepted/rejected, and approved/disapproved during the preceding year and cumulatively since the effective date of this Appendix, (B) the numbers of unique Covered Assets for which TFEs have been approved, (C) the numbers of approved TFEs that are still in effect as of on or about the date of the Annual Report; (D) the numbers of approved TFEs that reached their Expiration Dates or were terminated during the preceding year; and (E) the numbers of approved TFEs that are scheduled to reach their Expiration Dates during the ensuing year;*

The Regional Entities managed a large number of newly submitted TFE requests at the beginning of the TFE process, which was reflected in the 2011 Annual Report. Since NERC’s submittal of the 2011 Annual Report, the quantity of new TFE requests has decreased. As a result, the number of TFE requests categorized as being in the “initial review” category, as of July 1, 2012, is negligible. Therefore, this category is not included as part of the 2012 report.

Since the 2011 Annual Report was submitted, the total aggregate number of TFE requests that have been accepted is 1124. A breakdown of TFE Requests accepted by each Regional Entity is included in Table 1, below.

**Table 1**

Accepted									
	FRCC	MRO	NPCC	RFC	SERC	SPP-RE	TRE	WECC	Aggregate
CIP-005 R2.4.	0	0	0	0	0	0	0	1	1
CIP-005 R2.6.	3	5	0	21	6	4	2	16	57
CIP-005 R3.1.	0	0	0	0	0	0	0	0	0
CIP-005 R3.2.	0	0	0	1	1	2	3	1	8
CIP-006 R1.1.	1	1	0	4	1	0	0	2	9
CIP-007 R2.3.	6	4	1	13	5	0	3	31	63
CIP-007 R3.	0	4	0	26	1	1	0	4	36
CIP-007 R4.	23	16	9	69	42	21	22	173	375
CIP-007 R5.3.	15	7	11	82	23	10	3	34	185
CIP-007 R5.3.1.	1	2	1	4	4	1	4	9	26
CIP-007 R5.3.2.	10	7	8	41	15	1	6	51	139
CIP-007 R5.3.3.	10	3	2	9	9	0	3	22	58
CIP-007 R6.	7	2	0	26	11	3	1	69	119
CIP-007 R6.3.	5	2	1	12	4	2	0	22	48
<b>Total</b>	<b>81</b>	<b>53</b>	<b>33</b>	<b>308</b>	<b>122</b>	<b>45</b>	<b>47</b>	<b>435</b>	<b>1124</b>

The total number of TFE requests that have been rejected is 126. A breakdown of TFE Requests rejected by each Regional Entity is provided in Table 2, below.

**Table 2**

<b>Rejected</b>									
	<b>FRCC</b>	<b>MRO</b>	<b>NPCC</b>	<b>RFC</b>	<b>SERC</b>	<b>SPP-RE</b>	<b>TRE</b>	<b>WECC</b>	<b>Aggregate</b>
CIP-005 R2.4.	0	0	0	0	0	0	0	0	<b>0</b>
CIP-005 R2.6.	0	0	0	0	0	0	2	0	<b>2</b>
CIP-005 R3.1.	0	0	0	0	0	1	0	0	<b>1</b>
CIP-005 R3.2.	0	0	0	0	0	2	2	0	<b>4</b>
CIP-006 R1.1.	0	0	0	0	0	1	0	2	<b>3</b>
CIP-007 R2.3.	0	1	0	0	9	0	1	4	<b>15</b>
CIP-007 R3.	0	0	0	0	1	0	0	0	<b>1</b>
CIP-007 R4.	0	0	0	0	6	13	1	14	<b>34</b>
CIP-007 R5.3.	4	0	0	0	4	2	0	0	<b>10</b>
CIP-007 R5.3.1.	0	0	0	0	12	2	0	0	<b>14</b>
CIP-007 R5.3.2.	1	0	0	0	9	3	1	2	<b>16</b>
CIP-007 R5.3.3.	0	0	0	0	11	3	1	1	<b>16</b>
CIP-007 R6.	0	0	0	0	5	1	1	0	<b>7</b>
CIP-007 R6.3.	0	0	0	0	2	1	0	0	<b>3</b>
<b>Total</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>29</b>	<b>9</b>	<b>23</b>	<b>126</b>

The total number of TFE Requests that have been accepted and approved are 1305. A breakdown of the TFE Requests accepted and approved by each Regional Entity is provided in Table 3, below. As reflected in Table 3 below, TFEs for CIP-007, R4, are the most frequently accepted and approved TFEs.

**Table 3**

Approved									
	FRCC	MRO	NPCC	RFC	SERC	SPP-RE	TRE	WECC	Aggregate
CIP-005 R2.4.	0	0	0	0	0	0	4	0	4
CIP-005 R2.6.	1	5	0	21	3	5	32	9	76
CIP-005 R3.1.	0	0	0	0	0	0	0	0	0
CIP-005 R3.2.	0	0	2	1	4	3	20	1	28
CIP-006 R1.1.	0	1	1	4	2	0	5	1	14
CIP-007 R2.3.	1	4	0	13	7	2	13	21	61
CIP-007 R3.	0	4	0	26	2	0	2	4	38
CIP-007 R4.	9	8	54	69	47	37	73	70	330
CIP-007 R5.3.	7	4	39	82	30	7	14	23	206
CIP-007 R5.3.1.	1	1	7	4	12	3	23	0	48
CIP-007 R5.3.2.	4	5	29	41	31	16	36	19	181
CIP-007 R5.3.3.	6	2	18	9	5	4	24	13	81
CIP-007 R6.	1	2	21	26	34	7	28	29	148
CIP-007 R6.3.	2	2	9	12	25	1	22	17	90
<b>Total</b>	<b>32</b>	<b>38</b>	<b>180</b>	<b>308</b>	<b>202</b>	<b>42</b>	<b>296</b>	<b>207</b>	<b>1305</b>

The total number of TFE Requests that have been accepted and disapproved is 124.<sup>7</sup> A breakdown of the TFE Requests accepted and disapproved by Regional Entity is as follows: FRCC (8), MRO (0), NPCC (0), RFC (0), SERC (82), SPP-RE (29), TRE (0), and WECC (5).

To date, the number and types of Covered Assets for which TFEs have been approved has remained generally consistent since the program was initiated. A breakdown of approved Covered Assets indicates the category type and number of requests:

<sup>7</sup> “Accepted and disapproved” means that the proposed TFE met the initial filing requirements for acceptance, but upon subsequent detailed review was determined not to qualify.



**Table 4**

<b>Approved Covered Assets</b>	
<b>Category Type</b>	<b>Percent</b>
Network Data Communications Device	24.51%
Industrial Process Control System	22.90%
Server	17.63%
Physical Access Control System	3.76%
Peripheral Device	3.48%
Electronic Access Control System	3.43%
RTU	3.04%
Electronic Access Monitoring System	2.76%
PC Laptop	2.51%
Relay	2.24%
Data Storage Device	1.92%
Telecommunications Device	1.76%
Physical Access Monitoring System	1.62%
Digital Protective Control Device	0.50%
Physical Security Perimeter	0.33%
Transmitters	0.15%
Mainframe Computer	0.04%
Valve Controllers	0.01%
Other	7.41%

The number of approved TFEs that are “active” and still in effect is 3815. A breakdown of TFEs that are “active” and still in effect by Regional Entity is: FRCC (227), MRO (268), NPCC (546), RFC (1009), SERC (531), SPP-RE (85), TRE (389), and WECC (760).

The number of “approved” TFEs that reached their expiration dates or were terminated during the preceding year is 455. A breakdown of TFE requests that reached their expiration dates or were terminated by Regional Entity is: FRCC (0), MRO (5), NPCC (19), RFC (70), SERC (39), SPP-RE (91), TRE (231), and WECC (0).

The vast majority of active TFEs are open ended (*i.e.*, there is no specific date established for their expiration/termination). Thus, only a small minority of active TFEs have definite schedules for reaching their expiration dates during the ensuing year.

2. *Criteria (ii): Categorization of the submitted and approved TFE Requests to date by broad categories such as the general nature of the TFE Request, the Applicable Requirements covered by submitted and approved TFE Requests, and the types of Covered Assets that are the subject of submitted and approved TFE Requests.*

CIP-007, R4 continues to be the single requirement with the largest number of TFEs, with 30% of those reported. The table below shows the distribution of TFEs and the associated requirements.

**Table 5**

<b>Requirement</b>	<b>Total TFEs</b>	<b>Percentage of Total</b>
CIP-005 R2.4	9	0.5%
CIP-005 R2.6	119	6.3%
CIP-005 R3.1.	1	0.05%
CIP-005 R3.2.	63	3.35%
CIP-006 R1.1.	18	0.96%
CIP-007 R2.3.	113	6.00%
CIP-007 R3.	40	2.13%
CIP-007 R4.	561	29.81%
CIP-007 R5.3.	234	12.43%
CIP-007 R5.3.1.	91	4.84%
CIP-007 R5.3.2.	220	11.69%
CIP-007 R5.3.3.	124	6.59%
CIP-007 R6.	188	10%
CIP-007 R6.3.	101	5.37%

3. *Criteria (iii): Categorization of the circumstances or justifications on which the approved TFEs to date were submitted and approved, by broad categories such as the need to avoid replacing existing equipment with significant remaining useful lives, unavailability of suitable equipment to achieve Strict Compliance in a timely manner, or conflicts with other statutes and regulations applicable to the Responsible Entity.*

The categories of circumstances or justifications on which the TFEs to date were submitted and approved include:

- Not technically possible
- Operationally infeasible
- Precluded by technical limitations
- Adverse effect on bulk electric system reliability
- Cannot achieve by compliance date
- Excessive cost that exceeds reliability benefit
- Conflicts with other statutory or regulatory requirement
- Unacceptable safety risks

4. *Criteria (iv): Categorization of the compensating measures and mitigating measures implemented and maintained by Responsible Entities pursuant to approved TFEs, by broad categories of compensating measures and mitigating measures and by types of Covered Assets.*

Several Regional Entities reported that Responsible Entities employ multiple strategies to protect Covered Assets that are unable to meet applicable Reliability Standards. The principal strategies employed include protecting devices with physical and logical security controls. A significant portion of compensating and mitigating measures involved firewalls, the use of Intrusion Detection and Intrusion Prevention systems, and strong access policies.

The largest category of compensating and mitigating measures is an Electronic Security Perimeter (ESP). Other significant compensating and mitigating measures deployed include Physical Security Perimeter (PSP), Authentication, Intrusion Detection and Prevention (IDS/IPS), and System Status Monitoring. The table below describes the common compensating and mitigating measures reported by the Regional Entities:

**Table 6**

<b>Risk Mitigation/Compensation Strategies for Approved TFEs</b>		
<b>Electronic Security Perimeter (ESP)</b>	Covered Assets asserted in the TFE are protected as they reside within a defined ESP and access to/from these assets is controlled via defined access points.	<b>32.5%</b>
<b>Physical Security Perimeter (PSP)</b>	Covered Assets asserted in the TFE are protected as they reside within a defined PSP and access to these assets is controlled via defined access points.	<b>21.6%</b>
<b>Status Monitoring</b>	Covered Assets are protected by implementation of System Status Monitoring of all cyber assets residing within a defined ESP. Detection and alerting of system state and condition provides early warning and proactive troubleshooting and corrective action.	<b>11.3%</b>
<b>Enhanced Authentication</b>	Access to Covered Assets asserted in the TFE and all cyber assets that reside within a defined ESP are protected by multi-factor authentication services (e.g., SecurID, Biometrics).	<b>10.8%</b>
<b>Intrusion Detection and/Prevention Systems</b>	Covered Assets asserted in the TFE are protected by network or host based IDS/IPS services. Anomalous data traffic is detected and alerted on and/or prevented from affected Covered Assets.	<b>6.8%</b>
<b>Training</b>	Covered Assets are protected by general cyber security training and awareness related to CIP-004 or augmented training is provided due to the lack of strict compliance.	<b>6.1%</b>
<b>Host-Based Malware Prevention</b>	When Covered Assets asserted in a TFE cannot implement AV or anti-malware tools, they are protected by all other cyber assets within a defined ESP having these security controls installed and managed. Propagation of viruses (e.g., Trojans) to CCAs is a low risk.	<b>5.7%</b>
<b>Physical Monitoring</b>	When other mandatory controls cannot be implemented, Covered Assets and/or access to them are physically monitored by Responsible Entity staff.	<b>4.6%</b>
<b>Data Encryption</b>	When other mandatory controls cannot be implemented, data is encrypted between cyber assets to protect data confidentiality.	<b>0.5%</b>

5. *Criteria (v) – For each TFE Request that was rejected or disapproved, and for each TFE that was terminated, but for which, due to exceptional circumstances as determined by the Regional Entity, the Effective Date was later than the latest date specified in Section 5.1.5, 5.2.6, or 9.3, as applicable, a statement of the number of days the Responsible Entity was not subject to imposition of findings of violations of the Applicable Requirement or imposition of penalties or sanctions pursuant to Section 5.3.*

All eight Regional Entities reported that there were no instances of rejection, disapproval, or termination of TFE requests, where the effective date was extended past the latest date specified in Section 5.1.5, 5.2.6, or 9.3, as applicable, of Appendix 4D to the NERC Rules of Procedure.

6. *Criteria 6 - A discussion, on an aggregated basis, of Compliance Audit results and findings concerning the implementation and maintenance of compensating measures and mitigating measures, and the implementation of steps and the conduct of research and analyses to achieve Strict Compliance with the Applicable Requirements, by Responsible Entities in accordance with approved TFEs.*

The TFE Procedure, in conjunction with the Compliance Monitoring and Enforcement Program (CMEP), is the framework that Regional Entities utilize to review and audit TFE requests. During a compliance audit where TFEs are in scope, the subject Responsible Entity is *not* evaluated against the applicable Reliability Standard for which a TFE was accepted and approved. Instead, the Responsible Entity is evaluated against the alternative compliance obligations assumed by the Responsible Entity (*i.e.*, compensating and mitigating measures).

All eight Regional Entities have conducted Compliance Audits where approved or terminated TFEs were in scope. Regional Entities have reported that Responsible Entities are managing and maintaining their TFEs within the procedural requirements of Appendix 4D. Regional Entities have also issued audit findings that identify TFEs to be processed as potential violations through the CMEP.

7. *Criteria 7- Assessments, by Regional Entity (and for more discrete areas within a Regional Entity, if appropriate) and in the aggregate for the United States and for the jurisdictions of other Applicable Governmental Authorities, of the wide-area impacts on the reliability of the Bulk Electric System of approved TFEs in the aggregate, including the compensating measures and mitigating measures that have been implemented.*

The Regional Entity representatives who are designated “TFE managers” meet regularly to discuss various topics, including those pertaining to issues addressed by Criteria 7. The consensus opinion from those discussions is that there have been no negative wide area impacts on the reliability of bulk electric system as a result of any TFEs. Therefore, the wide-area impact of approved TFEs on the reliability of the bulk electric system, in the aggregate, has been minimal.

The issues identified by the Regional Entities, as a result of the assessment, include: implementation of anti-virus software and malware prevention tools, as required by CIP-007 R4; implementation passwords or specific password criteria, as required by CIP-007 R5.3, R5.3.1, R5.3.2 and R5.3.3; and inability to monitor or log system events related to Cyber Security, as required by CIP-007 R6 and R6.3.

Each Regional Entity reported similar experiences with the execution and management of the TFE process and the manner in which it impacted the reliability of the bulk electric system. Regional Entities reported that a large majority of Responsible Entities have implemented multiple compensating and mitigating measures for Covered Assets, and, in general, the mitigating and compensating measures of approved TFEs that were implemented in lieu of strict compliance with applicable CIP Reliability Standards accomplished the stated alternate compliance objective. As a result, the level of security for the bulk electric system achieved through the TFE process is comparable to strict compliance with the applicable Reliability Standards.

**8.**        *Criterion 8 - Discussion of efforts to eliminate future reliance on TFEs.*

Regional Entities report that many efforts are being considered to eliminate future reliance on TFEs, including:

- Upgrading or replacing Covered Assets that will enable implementation of security controls defined in CIP Standards and Requirements
- Removing CCAs that are covered by approved TFEs that reside within defined ESPs
- Retiring legacy systems that are now subject to coverage by an approved TFE
- Implementing previously unused or unidentified functionality on Covered Assets that will achieve Strict Compliance with the Applicable Requirement

Where applicable, upgrades of Covered Assets will result in strict compliance without having to rely on TFEs.

In addition, efforts to better train personnel on the requirements of applicable Reliability Standards and coordination with Regional Entity compliance monitoring and enforcement staff regarding the need for TFEs, has led to the continuing decline of devices that currently rely on a TFE for compliance. Moreover, non-essential devices are also being evaluated for continued inclusion within a defined electronic security perimeter (“ESP”). Where a device does not need to reside within the ESP for operational necessity, Covered Assets have been relocated outside of the ESP, eliminating the need for a TFE and reducing residual risk to devices remaining within the ESP.

The primary barriers identified by Regional Entities to eliminating TFEs include: 1) revising Reliability Standards, 2) certifying vendors, and 3) legacy systems. Specifically, with respect to revising Reliability Standards, Regional Entities note that it can be difficult to provide flexibility for future technology and security changes when developing a standard, thereby making it difficult to eliminate the TFE.

With respect to vendors, the Regional Entities support requirements in the standards to use products that are certified as secure in some way. Applying enhanced security features often requires that properly operating equipment be replaced with a more modern, secure models.

Therefore, in order to eliminate the need for a TFE, replacement costs may become a barrier to implementing enhanced security features.

### **C. Consistency in Review, Approval and Disapproval of TFE Requests**

Appendix 4D of the NERC Rules of Procedure requires that NERC and the Regional Entities collaborate to assure “consistency in the review, approval and disapproval of TFE Requests....”<sup>8</sup> Also, as noted above, Section 11.2.4 of the NERC Rules of Procedure requires that NERC submit with each Annual Report certain information concerning the manner in which Regional Entities have made determinations to approve or disapprove TFE Requests.

NERC has not received any reports of inconsistency either in assessing the accuracy or validity of TFEs submitted by Responsible Entities, or in the decisions approving or rejecting TFEs. The NERC and the Regional Entities “TFE managers” group continue to serve as the committee to review TFE Requests for consistency. Primary and alternate representatives from each Regional Entity, facilitated by NERC staff, meet regularly to discuss common concerns. Those representatives also led the efforts at their respective Regional Entities for receiving, reviewing, and reporting TFE-related data.

In addition to regularly scheduled conference calls and face-to-face meetings, the “TFE managers” communicate regularly by email, and discuss consistency issues at workshops and regular meetings with the goal of reaching consistency among the Regional Entities on the pertinent issues.

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<sup>8</sup> Section 11 of Appendix 4D of the NERC Rules of Procedure.



#### IV. CONCLUSION

For the foregoing reasons, NERC respectfully requests that the Commission accept the 2012 Annual Report as compliant with the directives contained in Order No. 706 and Appendix 4D of NERC's Rules of Procedure.

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that I have served a copy of the foregoing document upon all parties listed on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, D.C. this 28th day of September, 2012.

*/s/ Willie L. Phillips*  
Willie L. Phillips  
*Attorney for North American Electric  
Reliability Corporation*