



NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

June 30, 2011

Kimberly D. Bose
Secretary
Attn: Joseph H. McClelland
Director, Office of Electric Reliability
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: *North American Electric Reliability Corporation*, Docket No. RM11-11-000

Dear Mr. McClelland:

Attached are the second set of responses of the North American Electric Reliability Corporation (“NERC”) to the Federal Energy Regulatory Commission’s (“FERC”) Office of Electric Reliability’s April 12, 2011 letter to NERC (“FERC Data Request”) requesting additional information regarding NERC’s February 10, 2011 petition seeking approval of the proposed CIP Version 4 Reliability Standards. By this filing, NERC is providing a response to questions 3, 4, 5, 6, 7, and 9 of the data request. NERC responded to questions 1, 2, 8, 10, 11, and 12 of FERC’s Data Request on May 27, 2011. Pursuant to the Office of Electric Reliability’s April 14, 2011 Notice of Extension of Time to submit responses to the data request, NERC is hereby responding to the remaining FERC Data Request questions.

By way of background, the CIP Version 1 Standards were approved by NERC’s Board of Trustees on June 1, 2006 and subsequently approved by the Commission on January 17, 2008. The currently-approved CIP Standards include an implementation table that requires entities to self-certify their compliance status with the CIP-002 through CIP-009 standards every six months through a self-certification survey issued by NERC to the industry.

As a result of concerns raised by the July 2008 to January 2009 self-certification survey and the desire to better understand how the CIP Standards are being applied, NERC worked with the Regional Entities to expand the CIP self-certification survey in 2010 to include a Supplemental Questionnaire. The survey covered the 2009 time period (“2009 CIP Self-Certification Survey”). The supplemental questions were specifically designed to provide a more granular view of implementation of the CIP-002 Reliability Standard and the resulting determination of Critical Assets (“CAs”) and Critical Cyber Assets (“CCAs”) across the bulk power system. The 2009 CIP Self-Certification Survey gathered information regarding the total number of nuclear generating units, conventional generating stations, transmission substations, and Blackstart units owned by a given entity and those that have been determined to be CAs. The questions were changed to clarify the subjects of the questions and to add, by category, a

question to determine the number of CAs that have identified CCAs. The survey was also modified to capture more granularity in the generation area and to separate Blackstart generation from the non-nuclear generation. No information was collected regarding the identity of any facilities.

The results of the 2009 CIP Self-Certification Survey were analyzed and a report was developed that included a high-level summary of the data collected. The report presented observations, aggregated data on a Regional basis, and the outline of an action plan the ERO would pursue. That Privileged and Confidential, Non-Public report, entitled NERC's Critical Infrastructure Protection Standards Self-Certification Survey Results for the Audit Period ending December 31, 2009 ("2009 CIP-002 Self-Certification Report"), was sent to FERC on March 31, 2010 in accordance with Section 1003 of the NERC Rules of Procedure and 18 C.F.R. §388.112.

NERC made the following observations in the 2009 CIP-002 Self-Certification Report:

- Entities generally possessed a common understanding of the importance of both Blackstart generation units and System Control Centers ("SCCs") to Bulk Electric System reliability.
- The results varied by generator output and Region. The composition of the Bulk Electric System is such that, while some smaller units may be designated as critical due to their electric location in the interconnection, larger assets generally tend to be more logical candidates for CA designation. The results from the responses to the Supplemental Questions continued to show inconsistency in the treatment of such large baseload generation units, with some Regions having a significant percentage designated as CAs, while others had a very low percentage designated as CAs.

NERC reviewed these results in light of the industry-developed Critical Infrastructure Protection Committee ("CIPC") guideline that suggested units should be designated as CAs when their loss or compromise could violate any of the following Regional obligations defined by Balancing Authority, Reliability Coordinator, or Regional Reliability Assurer (see BAL-002-0 R1):

- Output exceeds Reserve Sharing Group obligation;
- Output exceeds Contingency Reserve obligation; or
- Must-run units.

The CIPC guideline also advised the owner/operator to consider the unit's importance to mitigate known Bulk Electric System constraint(s) and the impact that the loss of a generation unit would have to Bulk Electric System reliability, either for voltage, reactive power, or frequency support. Impacts associated with a generation unit (or units) to be considered include:

- Voltage collapse;
- Voltage going below the under-voltage load shed points established to mitigate the risk of voltage collapse or voltage instability in the Bulk Electric System (*e.g.*, Reliability Standard PRC-010-0);

- Exceeding limits that result in a Category D event as discussed in Reliability Standard TPL-004-0;
- Frequency going below the under-frequency load shed points without recovering in a reasonable period (*e.g.*, 30 minutes) once load is shed;
- System collapse due to frequency-related instability;
- Complete operational failure or shutdown of the portion of Bulk Electric System for which the entity is responsible, causing wide area instability, Separation or Cascading Outages affecting a wide area of the bulk power system; or
- The loss of generation, as determined by an engineering evaluation or other assessment method, resulting in an Interconnection Reliability Operating Limit (“IROL”) violation (Reliability Standard FAC-011-2).

While the results collected in the 2009 CIP Self-Certification Survey were not detailed enough to determine how specific assets were identified, they strongly suggested that a new framework for the identification of CAs and CCAs was needed. The results indicated that more effort was needed to expedite the development of Version 4 of the CIP-002 Reliability Standard, and closely monitor the results-based criteria from the development of the identification of CAs with CCAs across the bulk power system. NERC was specifically concerned about the apparent inconsistency in the application of the standards across the system, as evidenced by large variation from region to region. NERC began working with the Regional Entities and its stakeholders to better understand the current data and implementation of the standard.

In its action plan included at the end of the 2009 CIP-002 Self Certification Report, NERC committed to working with stakeholders to support current CIP-002-4 revision efforts to ensure completion by the end of 2010. On August 6, 2010, NERC issued a Request for Data or Information to stakeholders entitled “CIP-002 Critical Asset Methodology Data Request” that was based on the CIPC guidelines discussed above, in order to gather empirical data that could be used in the development of the proposed CIP-002-4 standard. Through the August 2010 Data Request, NERC expected to obtain a reasonable estimate of the impact of applying the proposed CIP-002-4 bright-line criteria, and not an exhaustive detailed analysis from entities.

The results of the CIP-002 Critical Asset Methodology Data Request were analyzed and used to develop a new proposed CIP-002-4 standard that includes bright-line criteria to be used for the identification of CAs and CCAs that was posted for industry comment on October 20, 2010. After two ballot and comment periods, the industry approved the CIP-002-4 standard and the associated Attachment 1 on December 31, 2010. The NERC Board of Trustees approved the proposed Reliability Standards on January 24, 2011 and recommended they be added to the NERC Reliability Standards. On February 10, 2011, NERC filed with FERC a petition for approval of the CIP Version 4 Reliability Standards that includes CIP-002-4—the bright line test for determining CAs. It also included data comparisons obtained from the August 2010 Data Request, and a rationale for each criterion presented in Attachment 1 of CIP-002-4 (the bright-line criteria).

On April 12, the Commission’s Office of Electric Reliability issued the FERC Data Request to NERC soliciting additional information regarding NERC’s February 10, 2011 petition seeking approval of the proposed CIP Version 4 Reliability Standards. NERC provided a

response to the first set of questions on May 27, 2011. In order to answer the remaining questions, on May 2, 2011 NERC issued an industry survey to all registered entities (“2011 Industry Survey”). The analysis of the results of the 2011 Industry Survey provided the following observations:

- In order for entities to apply the bright-line criteria in CIP-002-4 Attachment 1, they must have identified all Blackstart Resources on their system. Because EOP-005-2 was only recently accepted by the Commission, many Transmission Operators have not yet identified Blackstart Resources and Cranking Paths in their restoration plans as required by EOP-005-2. These analyses and identifications will be performed prior to the effective date of CIP-002-4, based on the implementation plans of EOP-005-2 and CIP-002-4. Additionally, it appears that some entities are still confused over the term “Blackstart Resource.” Some entities counted blackstart-capable units in their response to question 4.c., providing a response that some of their “Blackstart Resources” would not be classified as Critical Assets, which is contrary to criterion 1.4 of Attachment 1 of CIP-002-4. NERC will ensure that all Responsible Entities defined in CIP-002-4 are informed of the intent of criterion 1.4 prior to the effective date of CIP-002-4.
- Based on the 2011 Industry Survey, if all nuclear generation¹ and Blackstart Resources are excluded, 87 % of the remaining generation units in the continental U.S. produce less than 300 MVA. If those generators are eliminated from consideration, the CIP version 4 standards will be applicable to 24.6% of all remaining generator units located in the US.
- The 2009 Self-Certification Report indicated that approximately 11.9% of transmission system substations are presently identified as CAs. Additionally, only 50% of substations 300kV and greater were classified as CAs. Based on the results of the 2011 Industry Survey, 70% of substations 300kV and greater will be classified as Critical Assets. This is a significant improvement in the protection of the North American transmission system.
- Several entities stated in response to the 2011 Industry Survey that they have not performed a complete analysis of their system based on CIP-002-4, and are unsure whether some units may be classified as a CAs. Furthermore, they are unsure whether these CAs may contain CCAs. Therefore, the numbers in the final CA and CCA lists may change.

Please contact me if you have further questions or need additional information.

/s/ Holly A. Hawkins

Holly A. Hawkins

*Assistant General Counsel for Standards and Critical
Infrastructure Protection*

North American Electric Reliability Corporation

¹ The nuclear plants are subject to cybersecurity regulations of the Nuclear Regulatory Commission.

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

NORTH AMERICAN ELECTRIC) Docket No. RM11-11-000
RELIABILITY CORPORATION)

**RESPONSE OF THE NORTH AMERICAN ELECTRIC RELIABILITY
CORPORATION TO THE FEDERAL ENERGY REGULATORY
COMMISSION OFFICE OF ELECTRIC RELIABILITY'S
APRIL 12, 2011 DATA REQUEST**

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I. Introduction

This filing is the second part of the response to the data request issued by the Federal Energy Regulatory Commission's ("FERC" or the "Commission") Director of the Office of Electric Reliability on April 12, 2011 to the North American Electric Reliability Corporation ("NERC") for additional information in support of NERC's February 10, 2011 petition for approval of the CIP Version 4 Reliability Standards, including CIP-002-4, the bright line test for determining critical assets (the "Petition"). This filing addresses questions 3, 4, 5, 6, 7, and 9. The responses to questions 1, 2, 8 and 10 through 12 of the data request were provided to the Commission on May 27, 2011.

In order to provide a response to questions 3, 4, 5, 6, 7, and 9, NERC issued to all registered entities a NERC CIP Version 4 Survey ("2011 Industry Survey") on May 2, 2011. The questions used to develop the 2011 Industry Survey were based on FERC's April 12 Data Request to NERC. Using the results of the 2011 Industry Survey, NERC was able to develop a high-level summary of the information received, presenting the data only in aggregate, by function, and on a Regional Entity footprint basis. Entity-specific responses are not included in this summary.

II. Data Request Response

Background Questions

3. Please provide, by Regional Entity, the following information concerning U.S. System Control Centers controlling facilities of 100kV or more under the proposed Version 4 CIP Reliability Standards:

- a. How many U.S. System Control Centers will be identified as Critical Assets (CAs) with Critical Cyber Assets (CCAs)?

FRCC:	17
MRO:	54
NPCC:	48
RFC:	118
SERC:	85
SPP:	37
TRE:	51
WECC:	122

- b. How many U.S. System Control Centers will be identified as Critical Assets without CCAs?

FRCC:	1
MRO:	5

NPCC: 0
RFC: 8
SERC: 0
SPP: 6
TRE: 0
WECC: 1

c. How many U.S. System Control Centers will not be classified as a Critical Asset under the proposed Version 4 CIP Reliability Standards?

FRCC: 25
MRO: 8
NPCC: 7
RFC: 35
SERC: 23
SPP: 23
TRE: 22
WECC: 58

4. Please provide, by Regional Entity, the following information concerning U.S. Blackstart Resources under the proposed Version 4 CIP Reliability Standards:

a. How many U.S. Blackstart Resources will be identified as Critical Assets with CCAs?

FRCC: 8
MRO: 26
NPCC: 38
RFC: 66
SERC: 34
SPP: 2
TRE: 2
WECC: 58

b. How many U.S. Blackstart Resources will be identified as Critical Assets without CCAs?

FRCC: 10
MRO: 24
NPCC: 55
RFC: 67
SERC: 33

SPP: 22
 TRE: 12
 WECC: 50

c. How many U.S. Blackstart Resources will not be classified as a Critical Asset under the proposed Version 4 CIP Reliability Standards?

FRCC: 0
 MRO: 4
 NPCC: 17
 RFC: 7
 SERC: 7
 SPP: 0
 TRE: 0
 WECC: 0

Comments: Several entities stated that they have not performed a complete analysis of their system based on CIP-002-4, and are unsure whether some units may be classified as Critical Assets. Furthermore, these entities responded that they are unsure whether these Critical Assets may contain Critical Cyber Assets. Therefore, the numbers in the final Critical Asset and Critical Cyber Asset lists may change. Also, because EOP-005-2 was only recently accepted by the Commission, many Transmission Operators have not yet identified Blackstart Resources and Cranking Paths in their restoration plans as required by EOP-005-2. This analysis and identification will be performed prior to the effective date of CIP-002-4. Additionally, it appears that some entities are still confused over the term “Blackstart Resource.” Some entities counted black start capable units in their response to question 4.c. NERC will ensure that all Responsible Entities defined in CIP-002-4 are educated on the definition of Blackstart Resource prior to the effective date of CIP-002-4.

5. For transmission facilities 100kV or above, please provide, by Regional Entity, the following information concerning U.S. Transmission Substations under the proposed Version 4 CIP Reliability Standards:

a. How many U.S. Transmission Substations include elements that operate at 100-299kV? Of these, how many will be identified as Critical Assets or include elements identified as Critical Assets? How many of these Critical Assets have associated CCAs?

Region	# substations	# Critical Assets	CAs with CCAs
FRCC	521	58	38
MRO	1442	92	63

NPCC	690	84	55
RFC	2631	228	118
SERC	4184	204	122
SPP	1437	29	23
TRE	1082	26	22
WECC	3051	262	148

b. How many U.S. Transmission Substations include elements that operate at 300-499kV? Of these, how many will be identified as Critical Assets or include elements identified as Critical Assets? How many of these Critical Assets have associated CCAs?

Region	# substations	# Critical Assets	CAs with CCAs
FRCC	0	0	0
MRO	145	84	66
NPCC	118	99	51
RFC	287	158	140
SERC	107	38	1
SPP	82	44	26
TRE	100	56	30
WECC	98	47	27

c. How many U.S. Transmission Substations include elements that operate at 500kV or above? How many of these Critical Assets have associated CCAs?

Region	# substations	CAs with CCAs
FRCC	16	14
MRO	6	1
NPCC	1	0
RFC	87	56
SERC	176	156
SPP	4	1
TRE	0	0
WECC	147	115

Comments: Several responders expressed concern that the above information may include double counting, because a substation that contains elements that operate at 345kV and 230kV would be counted as two substations, even though it might be listed only once on a Critical Asset list. Similarly, a substation that contains elements that operate at 230kV and 115kV would be counted as one substation, which is different than the way a 345kV and 230kV substation would

be counted. Other entities are still developing their CIP-002-4 Critical Asset and Critical Cyber Asset analyses and are therefore unsure that the numbers reported in response to the survey will match their final lists once the CIP-002-4 standard is implemented. Additionally, CIP-002-4 Attachment 1 criteria 1.8 and 1.9 require the identification of Transmission Elements that a Reliability Coordinator, Planning Authority or Transmission Planner identify in system studies. In a few cases those studies have not yet been performed.

6. Excluding Blackstart Resources and nuclear generation units, please provide, by Regional Entity and by size (0-299MVA, 300-499MVA, 500-999MVA, 1000+ MVA), the following information concerning U.S. generation units under the proposed Version 4 CIP Reliability Standards:

- a. How many U.S. generation units will be identified as Critical Assets with CCAs?

Region	0-299MVA	300-499MVA	500-999MVA	1000+ MVA
FRCC	0	0	2	2
MRO	1	0	0	0
NPCC	7	5	1	1
RFC	41	6	29	8
SERC	121	15	46	12
SPP	2	0	5	0
TRE	4	0	19	2
WECC	99	17	25	5

- b. How many U.S. generation units will be identified as Critical Assets without CCAs?

Region	0-299MVA	300-499MVA	500-999MVA	1000+ MVA
FRCC	4	8	12	9
MRO	34	0	5	0
NPCC	17	12	4	0
RFC	23	10	22	7
SERC	25	12	7	0
SPP	1	1	8	0
TRE	8	6	5	0
WECC	78	0	1	0

- c. How many U.S. generation units will not be classified as a Critical Asset under the proposed Version 4 CIP Reliability Standards?

Region	0-299MVA	300-499MVA	500-999MVA	1000+ MVA
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FRCC	123	10	9	1
MRO	1597	16	16	0
NPCC	407	13	17	8
RFC	1215	393	33	8
SERC	877	41	30	4
SPP	615	21	22	0
TRE	2334	22	9	0
WECC	2131	318	19	0

Questions Regarding “Bright Line Criteria” in Attachment 1 of Proposed Reliability Standard CIP-002-4:

7. Criterion 1.1 provides that “each group of generating units . . . at a single plant location with an aggregate highest rated net Real Power capability of the preceding 12 months equal to or exceeding 1500 MW in a single Interconnection” shall be considered a Critical Asset. The Transmittal Letter states at page 15 that, “The standard drafting team used 1500 MW as a number derived from the most significant Contingency Reserves operated in various Balancing Authorities in all regions. Using this number and data reported by the U.S Energy Information Administration . . . the team determined that approximately 146 generators in the United States would be classified as Critical Assets using this criterion. This accounts for 29% of the installed generator capacity in the United States.”
 - a. Please fully explain the basis for the SDT’s 1500 MW threshold. Provide references to any supporting documentation, including applicable SDT discussions in the SDT minutes.

The draft wording was decided on at the September 2010 drafting team meeting in Winnipeg, Manitoba. The meeting notes are contained in pages 2499 to 2555 of the CIP V4 Errata Filing filed with the Commission on April 12, 2011. Page 2503 includes a table summarizing the development of Criterion 1.1. The drafting team was able to obtain unanimous agreement of the wording “Each group of generating units (including nuclear generation) at a single plant location with an aggregate highest rated net Real Power capability of the preceding 12 months equal to or exceeding 1500 MW.” A detailed summary of that discussion is contained on pages 2511-2514. On page 2512, a chart of the known reserve margins for various regional entities is provided, providing a range of 900 MW to 2300 MW. A rough average was performed to arrive at 1500 MW. In addition, a standard drafting team member analyzed the data reported by the U.S Energy Information Administration at

<http://www.eia.doe.gov/cneaf/electricity/page/capacity/existingunits2008.xls>, which shows that approximately 146 generators in the United States would be classified as Critical Assets using this criterion. This analysis included nuclear generation sites. Since NERC filed the February 10, 2011 petition, the Commission issued an Order Dismissing Compliance Filing on March 10, 2011 in Docket No. RM06-22-014 which determined that “(b)ased on the NRC’s November 26, 2010 letter, we find that the NRC’s cyber security rule appears to cover all balance of plant, and no balance of plant at a U.S. nuclear power plant has been found to be subject to NERC’s CIP Standards.” This eliminated a few sites from consideration for Criterion 1.1. In the NERC data survey that was issued to industry on May 2, 2011 the number of sites that were included under Criterion 1.1 dropped to 130.

b. Please clarify whether “146 generators” refers to generator units or locations housing multiple generator units.

In this instance, “146 generators” refers to locations housing one or more generator units.

c. Please provide a breakdown by Regional Entity of the number of generators and percentage of generation capacity captured by Criterion 1.1.

Region	# of generators	% capacity
FRCC	36	59.8%
MRO	7	8.2%
NPCC	37	16.7%
RFC	129	31.8%
SERC	165	32.3%
SPP	18	19.2%
TRE	44	39.3%
WECC	154	29.1%
Total	590	30.6%

d. Please provide the percentage of generator locations captured by Criterion 1.1.

According to numbers provided by respondents to the NERC data survey that was issued to industry on May 2, 2011, the CIP version 4 standards will be applicable to 6.8% of all generator locations in the US. In addition, the CIP version 4 standards provide backstop protection to any nuclear facility that if at a future time, it is determined that any of the systems, structures or components within a nuclear power plant’s balance of plant are subject to NERC’s CIP Standards. Using the answers provided to Question 6 above, if generators

below 300MVA are eliminated from consideration, the CIP version 4 standards will be applicable to 24.6% of all generator units located in the US

9. Criterion 1.7 provides that “Transmission Facilities operated at 300 kV or higher at stations or substations interconnected at 300 kV or higher with three or more other transmission stations or substations” shall be considered Critical Assets. Please identify the number of substations that will be captured by Criterion 1.7, explain NERC’s basis for this conclusion, and identify by Exhibit and page number any supporting data in the record.

FRCC:	6
MRO:	60
NPCC:	39
RFC:	160
SERC:	110
SPP:	34
TRE:	50
WECC:	91

These numbers were provided by respondents to a NERC data survey that was issued to industry on May 2, 2011.