

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Request for Data or Information [DRAFT]

Order No. 754 Single Point of Failure on Protection Systems

RELIABILITY | ACCOUNTABILITY



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Table of Contents

Introduction and Survey Scope..... 1

Due Date and NERC Contact Information..... 2

Authority 3

Survey..... 6

 Description 6

 Method 6

 Table A: Buses to be Tested 8

 Table B: Protection System Attributes to be Evaluated 9

 Table C: Performance Measures..... 10

 Table D: Station DC Supply Attributes to be Reported..... 10

Rationale 10

 Selected Buses ≥ 100 kV 10

 Protection System Components 11

 Performance Measure 11

 Three-Phase Condition..... 11

Use of Data..... 12

Entities Required to Comply 12

Schedule and Reporting..... 12

 Scheduled Reporting..... 12

Dissemination of Data..... 13

Burden to Entities 13

Organization Information and Approval..... 15

 Transmission Planning Entity Contact Information 15

Approval..... 15

Introduction and Survey Scope

In accordance with Section 1600 of the NERC Rules of Procedure,¹ NERC may request data or information that is deemed necessary to meet its obligations under Section 215 of the Federal Power Act, as authorized by Section 39.2(d) of the Federal Energy Regulatory Commission's ("FERC") regulations ("data request"). This is a proposal for such a request. On September 15, 2011, FERC issued [Order No. 754](#)² *Interpretation of Transmission Planning Reliability Standard* in which FERC stated that "there is an issue concerning the study of non-operation of non-redundant primary protection systems e.g., the study of a single point of failure on protection systems."³ FERC also directed NERC to initiate a process "to explore this reliability concern, including where it can best be addressed, and identify any additional actions necessary to address the matter."⁴

On October 24 and 25, 2011, a Technical Conference on "Single Point of Failure on Protection Systems" was held by FERC that was attended by FERC staff, NERC staff, and several industry subject matter experts from around the United States and Canada. At the Technical Conference, five single point of failure events were discussed including an extended discussion of the so-called "Westwing Outage" that occurred in 2004 on the Western Interconnection. NERC staff believes that the prudent approach to address this issue is to first discover the extent and risk involved with single point of failure events. Therefore, NERC staff seeks approval of this Section 1600 data request as the proper approach to determine the risks to the Bulk Electric System ("BES") posed by single point of failure events, so that NERC can then craft an appropriate response to address the issue. Accordingly, NERC is issuing this data request in accordance with the requirements of Section 1602.1 of the NERC Rules of Procedure. NERC provided this proposed data request to FERC for information on December 14, 2011. NERC is hereby posting this proposed data request for public comment for a forty-five (45) day comment period. After consideration of comments received, NERC will present this proposed data request to the NERC Board of Trustees for approval, as required by Section 1602 of the NERC Rules of Procedure. Upon NERC Board of Trustees approval, this data request will become mandatory.

The purpose of this survey is to solicit data and information from each Transmission Planner in the United States to identify any potential single points of failure on their protection systems in order to determine whether there is a risk to BES reliability.

¹ NERC's Rules of Procedure are available at: http://www.nerc.com/files/NERC_Rules_of_Procedure_EFFECTIVE_20111117.pdf.

² *Interpretation of Transmission Planning Reliability Standard*, 136 FERC ¶ 61,186 (http://www.nerc.com/filez/standards/order_754.html)

³ *Ibid.*, at P 19 (2011). ("Order No. 754")

⁴ *Ibid.* at P 20 (2011). ("Order No. 754")

Due Date and NERC Contact Information

The completion of this survey and submission to NERC is due within twelve (12) months beginning the first day of the first month following NERC Board of Trustees approval and includes periodic status reporting as defined in the section, "Schedule and Reporting."

The survey must be completed in electronic format. Should the submitting entity experience any issues with submitting its data, contact Scott Barfield-McGinnis, Order No. 754 Project Manager via email at Scott.Barfield@nerc.net or by telephone at (404) 446-9689. If any of your entity's responses to this survey are deemed confidential/safeguards, contact the project manager directly for further instructions.

Official correspondence may be mailed to:

NERC – Order No. 754
C/O Scott Barfield, Standards Development Advisor
3353 Peachtree Road, Suite 600, North Tower
Atlanta, GA 08540

Alternate NERC Points of Contact:

Herb Schrayshuen: Herb.Schrayshuen@nerc.net
Phone: (404) 446-2563

Phil Tatro: Phil.Tatro@nerc.net
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Authority

Under Section 215 of the Federal Power Act (16 U.S.C. § 824o), Congress entrusted FERC with the duties of approving and enforcing rules to ensure the reliability of the Nation’s bulk power system, and with the duties of certifying an Electric Reliability Organization (“ERO”) that would be charged with developing and enforcing mandatory Reliability Standards, subject to FERC approval. NERC was certified as the ERO on July 20, 2006. NERC’s authority for issuing this survey is derived from Section 215 of the Federal Power Act, and from the following sources:

NERC is requesting this information in accordance with its authority provided in 18 C.F.R. §39.2(d), which provides:

Each user, owner or operator of the Bulk-Power System within the United States (other than Alaska and Hawaii) shall provide the Commission, the Electric Reliability Organization and the applicable Regional Entity such information as is necessary to implement section 215 of the Federal Power Act as determined by the Commission and set out in the Rules of the Electric Reliability Organization and each applicable Regional Entity. The Electric Reliability Organization and each Regional Entity shall provide the Commission such information as is necessary to implement section 215 of the Federal Power Act.

NERC Rules of Procedure Section 1600 provides:

1601. Scope of a NERC or Regional Entity Request for Data or Information

Within the United States, NERC and regional entities may request data or information that is necessary to meet their obligations under Section 215 of the Federal Power Act, as authorized by Section 39.2(d) of the Commission’s regulations, 18 C.F.R. § 39.2(d). In other jurisdictions NERC and regional entities may request comparable data or information, using such authority as may exist pursuant to these rules and as may be granted by ERO governmental authorities in those other jurisdictions. The provisions of Section 1600 shall not apply to requirements contained in any Reliability Standard to provide data or information; the requirements in the Reliability Standards govern. The provisions of Section 1600 shall also not apply to data or information requested in connection with a compliance or enforcement action under Section 215 of the Federal Power Act, Section 400 of these Rules of Procedure, or any procedures adopted pursuant to those authorities, in which case the Rules of Procedure applicable to the production of data or information for compliance and enforcement actions shall apply.

1602. Procedure for Authorizing a NERC Request for Data or Information

- 1. NERC shall provide a proposed request for data or information or a proposed modification to a previously-authorized request, including the information specified*

in paragraph 1602.2.1 or 1602.2.2 as applicable, to the Commission's Office of Electric Reliability at least twenty-one (21) days prior to initially posting the request or modification for public comment. Submission of the proposed request or modification to the Office of Electric Reliability is for the information of the Commission. NERC is not required to receive any approval from the Commission prior to posting the proposed request or modification for public comment in accordance with paragraph 1602.2 or issuing the request or modification to reporting entities following approval by the Board of Trustees.

2. *NERC shall post a proposed request for data or information or a proposed modification to a previously authorized request for data or information for a forty-five (45) day public comment period.*
 - 2.1. *A proposed request for data or information shall contain, at a minimum, the following information: (i) a description of the data or information to be requested, how the data or information will be used, and how the availability of the data or information is necessary for NERC to meet its obligations under applicable laws and agreements; (ii) a description of how the data or information will be collected and validated; (iii) a description of the entities (by functional class and jurisdiction) that will be required to provide the data or information ("reporting entities"); (iv) the schedule or due date for the data or information; (v) a description of any restrictions on disseminating the data or information (e.g., "confidential," "critical energy infrastructure information," "aggregating" or "identity masking"); and (vi) an estimate of the relative burden imposed on the reporting entities to accommodate the data or information request.*
 - 2.2. *A proposed modification to a previously authorized request for data or information shall explain (i) the nature of the modifications; (ii) an estimate of the burden imposed on the reporting entities to accommodate the modified data or information request, and (iii) any other items from paragraph 1.1 that require updating as a result of the modifications.*
3. *After the close of the comment period, NERC shall make such revisions to the proposed request for data or information as are appropriate in light of the comments. NERC shall submit the proposed request for data or information, as revised, along with the comments received, NERC's evaluation of the comments and recommendations, to the Board of Trustees.*
4. *In acting on the proposed request for data or information, the Board of Trustees may authorize NERC to issue it, modify it, or remand it for further consideration.*
5. *NERC may make minor changes to an authorized request for data or information without board approval. However, if a reporting entity objects to NERC in writing to*

- such changes within 21 days of issuance of the modified request, such changes shall require board approval before they are implemented.*
6. *Authorization of a request for data or information shall be final unless, within thirty (30) days of the decision by the Board of Trustees, an affected party appeals the authorization under this Section 1600 to the ERO governmental authority.*

1603. Owners, Operators, and Users to Comply

Owners, operators, and users of the bulk power system registered on the NERC Compliance Registry shall comply with authorized requests for data and information. In the event a reporting entity within the United States fails to comply with an authorized request for data or information under Section 1600, NERC may request the Commission to exercise its enforcement authority to require the reporting entity to comply with the request for data or information and for other appropriate enforcement action by the Commission. NERC will make any request for the Commission to enforce a request for data or information through a non-public submission to the Commission's enforcement staff.

Survey

Description

The survey seeks to identify elements,⁵ within each transmission planning area on which a three-phase fault accompanied by a protection system failure, that could result in a potential reliability risk by using the method described below. The following items will be reported in accordance with the data reporting template:⁶

- Statistics concerning the buses evaluated
- Statistics concerning the attributes of the protection system(s) associated with each identified element
- Statistics concerning the attributes of the station dc supply at selected buses in each transmission planning area

Method

The Transmission Planner and the Generator Owner(s) and Transmission Owners within the Transmission Planner's planning area will follow the specific steps below as the method for creating the statistics associated with this data request.

1. Each Transmission Planner will meet with Transmission Owners and Generator Owners in its transmission planning area to identify the following:
 - Any bus⁷ from Table A, "Buses to be Tested," that can be excluded from testing on the basis that the protection system(s) for all elements connected to the bus and for the physical bus(es), if any, meet the attributes for all categories in Table B, "Protection System Attributes to be Evaluated," based on the Transmission Owner's or Generator Owner's "as-built" knowledge of the protection system(s).
 - Transformers with through-fault⁸ protection and at least one winding connected at a bus to be tested.
2. Each Transmission Planner will simulate a three-phase fault on each bus in its transmission planning area, identified in step 1 based on the Transmission Owner or Generator Owner

⁵ Any electrical device with terminals that may be connected to other electrical devices such as a generator, transformer, circuit breaker, bus section, or transmission line. An element may be comprised of one or more components.

⁶ The data request reporting template is provided with the data request as a tool to assist the Transmission Planner and will not be used to submit actual data. NERC will issue further guidance on the method of reporting.

⁷ For the purposes of this testing, all bus configurations will be treated as a straight bus (single-breaker) configuration. For example, a fault simulated on a ring bus configuration is modeled as though the fault is on a straight bus, and not on the terminals of any of the elements connected in the ring bus configuration. A fault simulated on a breaker-and-a-half configuration is modeled as though the two buses are a single straight bus.

⁸ An event occurring on an electric system such as a short circuit, a broken wire, or an intermittent connection.

confirming that the protection system(s) for all elements connected to the bus and for the physical bus(es), if any, meet the attributes for all categories in Table B, "Protection System Attributes to be Evaluated." The three-phase fault is cleared based on the following conservative simulation parameters:

- Trip the remote terminals of all transmission lines connected to the faulted bus based on the maximum expected remote clearing time provided by the Transmission Owner or Generator Owner.
 - For each transformer connected to the faulted bus that is protected by through-fault protection, the Transmission Planner will trip the transformer at its other terminal(s) not connected to the faulted bus based on the maximum expected clearing time provided by the Transmission Owner or Generator Owner.
 - For each transformer connected to the faulted bus that is not protected by through-fault protection, the Transmission Planner will not trip the transformer or any element connected to the other terminal(s) of the transformer not connected to the faulted bus.
 - Evaluate the system response for each simulated fault against the criteria in Table C, "Performance Measures."
 - Create an initial list of buses owned by each Transmission Owner and Generator Owner at which the simulated system response exceeds at least one performance measure criteria from Table C, "Performance Measures," and provide this initial list to each respective Transmission Owner and Generator Owner.
3. The Transmission Owner and Generator Owner will evaluate the protection system(s) for each element connected at each bus identified by the Transmission Planner in step 2 and for the physical bus(es), if any, to determine whether a single point of failure exists due to not meeting the attributes for any category in Table B, "Protection System Attributes to be Evaluated."
 4. The Transmission Owner and Generator Owner will provide the Transmission Planner with a revised list of buses at which a single point of failure exists on any element for any component category in Table B. This revised list will be used by the Transmission Planner in steps 5 and 6 to reassess the conservative simulations performed in step 2.
 5. The Transmission Planner will consult with the Transmission Owner and the Generator Owner regarding actual clearing times⁹ for all elements that will trip for a fault on each bus identified on the revised list of buses provided in step 4.
 6. The Transmission Planner will simulate a three-phase fault on each bus identified on the revised list of buses provided in step 4 using the actual clearing times provided by the

⁹ The actual clearing time is the time calculated by the Transmission Owner or Generator Owner at which the remote terminals of elements will trip for a three-phase fault on the bus under study. In some cases, an element may not trip at its remote terminals if the protection system at those terminals will not detect the fault. In such cases, the fault will remain un-cleared in the simulation.

Transmission Owner and Generator Owner¹⁰ in accordance with the method described in step 2, except that actual clearing times will be used in place of tripping elements based on the maximum expected clearing time.

7. The Transmission Planner will update the revised list of buses owned by each Transmission Owner and Generator Owner developed in step 2, at which the simulated system response exceeds at least one performance measure criteria in Table C, "Performance Measures," and provide the final list to each respective Transmission Owner and Generator Owner.
8. The Transmission Owner and Generator Owner will provide "as-built" information to the Transmission Planner necessary for the Transmission Planner to complete the data request reporting template. This data includes:
 - The attributes of the protection system(s) listed in Table B, "Protection System Attributes to be Evaluated," for each bus from the final list provided by the Transmission Planner in step 7.
 - The attributes of the station dc supply listed in Table D, "Station DC Supply Attributes to be Reported," for each bus that meet the criteria in Table A, "Buses to be Evaluated."
9. The Transmission Planner will provide the following information in accordance with the data request reporting template.¹¹
 - Statistics concerning the buses evaluated
 - Statistics concerning the attributes of the protection system(s) associated with each identified element
 - Statistics concerning the attributes of the station dc supply at selected buses in each transmission planning area

Table A: Buses to be Tested
Buses operated at 200 kV or higher with 4 or more circuits
Buses operated at 100 kV to 200 kV with 6 or more circuits
Buses operated at 100 kV or greater with 4 or more circuits and at which a bus fault and tripping of all connected elements at the remote terminals will result in 300 MW or more of consequential load loss ¹² as a result of remote clearing

¹⁰ By mutual agreement with the Transmission Owners and Generator Owners, the Transmission Planner may test all buses using actual clearing times provided by the Transmission Owner and Generator Owner in step 2.

¹¹ Data reporting will be facilitated through a web-based application based on the data request reporting template provided with the data request. The accompanying template is unofficial and intended to assist the Transmission Planner. NERC will issue instructions on the method of reporting consistent with the reporting schedule.

Table A: Buses to be Tested

Buses with aggregate generation of 1,000 MW or higher
Buses directly supplying off-site power to a nuclear generating station
Any additional buses the Transmission Planner believes are necessary for the reliable operation of the BES

Note: For purposes of applying Table A, circuits include transmission lines, transmission transformers with the primary terminal and at least one secondary terminal operated at 100 kV or higher, and generator step-up transformers.

Table B: Protection System Attributes to be Evaluated

Protective Relays: The protection system for the element includes two independent protective relays that are used to measure electrical quantities, sense an abnormal condition such as a fault, and respond to the abnormal condition.
Communications Systems: The protection system for the element includes two independent communication channels ¹³ and associated communication equipment when such communication between protective relays is needed to satisfy BES performance required in the TPL standards.
AC Current and Voltage Inputs: The protection system includes two independent ac current sources and related inputs and two independent ac voltage sources and related inputs, except that the two ac current sources may have a common primary current transformer (CT) winding and the two ac voltage inputs may have common capacitance coupled voltage transformer (CCVT), voltage transformer (VT), or similar device primary windings.
DC Control Circuitry: The protection system includes two independent dc control circuits with no common dc control circuitry, auxiliary relays, or circuit breaker trip coils.

Note: Physical separation of protection system components is not necessary for protection system components to be reported as independent.

¹² For the purpose of this data request, “consequential load loss” is defined as all load that is no longer served by the transmission system as a result of transmission facilities being removed from service by protection system operations necessary to isolate the fault.

¹³ For the purpose of this data request, please see the NERC SPCTF technical paper, [Protection System Reliability – Redundancy of Protection System Elements](#), Section 5.4, Communication Channel, for additional guidance on independence of communication channels.

Table C: Performance Measures

- | |
|---|
| 1. System does not maintain stability ¹⁴ (instability of units is not indicative of system instability, but must be included in the loss of generation in measure #3) |
| 2. Unintended system separation resulting in an island of 1,000 MW or more, not as a direct result of the remote fault clearing |
| 3. Loss of generation of 2,000 MW or more in the Eastern Interconnection or Western Interconnection, or 1,000 MW or more in the ERCOT or Québec Interconnections (total loss of generation includes generation disconnected as a direct result of the remote fault clearing and includes generating units that do not maintain stability) |

Table D: Station DC Supply Attributes to be Reported

- | |
|--|
| The protection system includes two independent station dc supplies |
| The protection system includes one dc supply that is centrally monitored, including alarming for a battery open condition if the station dc supply is a battery |
| The protection system includes one dc supply that is centrally monitored, but does not include alarming for a battery open condition if the station dc supply is a battery |
| The protection system includes one dc supply that is not centrally monitored |

Note: A station dc supply¹⁵ includes one station battery, or single charger, or other single dc source.

Rationale

Although the system events for which NERC event analysis has identified a protection system single point of failure was causal or contributory have been limited to elements operated at >200 kV, it is possible that a reliability risk may exist at buses operated below 200 kV. It would be difficult to extrapolate the assessment results for elements operated at greater than 200 kV to be representative of those for elements operated below 200 kV because of differences in protection system design attributes and transmission system characteristics. The impact to bulk power system reliability associated with delayed fault clearing at voltages below 200 kV is expected to be less severe because of higher system impedance and more extensive use of

¹⁴ The ability of an electric system to maintain a state of equilibrium during normal and abnormal conditions or disturbances.

¹⁵ For the purpose of this data request, please see the NERC SPCTF technical paper, [Protection System Reliability – Redundancy of Protection System Elements](#), Section 5.8, DC Source, for additional guidance on independence of station dc supplies.

remote backup protection; however, single points of failure on a protection system are more likely to exist on elements operated below 200 kV. For the purpose of this data request, the selection of buses ≥ 100 kV results in an expedient approach by providing data from a representative sample of buses at all voltage levels included on the Bulk Electric System.

The protection system components of interest include any component that could possibly result in delayed clearing of a fault due to a single protection system component failure. For the purpose of this data request protection system components includes those components discussed in the System Protection and Control Task Force ([SPCTF technical paper](#)).¹⁶ The distinctions in the SPCTF technical paper more accurately describe and define the components to be evaluated than the term Protection System.¹⁷ Limiting the scope to the relay types listed in [TPL-001-2](#)¹⁸ for the Table 1, P5, contingency is considered to restrict the components such that it will not identify all potential Westwing-type events.¹⁹ Although the data used to support the NERC Industry Alert was based on failures of auxiliary relays and lockout relays, it is not reasonable to rule out the potential for a failure of other protection system components. If the data request identifies that a risk does exist, requesting information regarding each protection system component will make it possible to qualify the extent of the risk.

The performance measure in the data request is based on the characteristics of events that exhibit system performance attributes that could be similar to the Westwing event, or other events upon which the NERC Industry Alert²⁰ was based.

Limiting the data request to a three-phase fault provides a conservative method to identify potential Westwing-type events. Although conservative, this method is appropriate in that single-line-to-ground (SLG) faults with delayed clearing typically evolve to a multi-phase fault. Simulating a three-phase fault from inception allows Transmission Planners to use existing

¹⁶ Protection System Reliability – Redundancy of System Protection Elements, NERC System Protection and Control Task Force (SPCTF), November 2008. (http://www.nerc.com/docs/pc/spctf/Redundancy_Tech_Ref_1-14-09.pdf)

¹⁷ NERC Glossary term “Protection System” approved by the NERC Board of Trustees on 11/19/2010. (http://www.nerc.com/files/Glossary_of_Terms_2011October26.pdf)

¹⁸ NERC Reliability Standard, TPL-001-2, adopted by the NERC Board of Trustees on August 4, 2011, filed with FERC for approval on October 19, 2011. (http://www.nerc.com/files/Final_TPL-001-2%20Petition_20111019_complete.pdf)

¹⁹ The Westwing disturbance resulted in resulting in the loss of approximately 5,000 MW of generation and the potential for collapse of the Western Interconnection. Additional information on this issue can be found in the NERC Industry Alert, [Protection System Single Points of Failure](#). (<http://www.nerc.com/fileUploads/File/Events%20Analysis/A-2009-03-30-01.pdf>)

²⁰ NERC Industry Alert, Protection System Single Points of Failure. (<http://www.nerc.com/fileUploads/File/Events%20Analysis/A-2009-03-30-01.pdf>)

simulations of a three-phase fault with protection system failure ([TPL-004-0](#), Category D²¹) and eliminates conjecture as to the timing and mechanism by which a single line to ground (SLG) fault may evolve to a multi-phase fault.

Use of Data

This data request has been developed with the objective of establishing an effective and efficient means to identify whether a reliability concern exists regarding single points of failure on protection systems, while limiting the burden on registered entities. Though this approach is expedient for identifying whether a reliability concern exists, an additional data request or additional analysis may be required to quantify the extent of the risk.

Entities Required to Comply

The entity responsible for coordinating the fulfillment of the data request will be the Transmission Planner. Because planning staff and protection staff may not be in the same company or business unit, this request will require the cooperation of the Transmission Owners and Generator Owners in a Transmission Planner's area. Transmission Owners and Generator Owners must comply with requests for assistance from the Transmission Planners.

Identifying the risk of a Westwing-type event requires information regarding both the susceptibility of the system to adverse performance if a protection system single point of failure occurs and determining where the protection system(s) contain single points of failure. This requires participation by Transmission Planners, Transmission Owners, and Generator Owners. Since the inquiry is related to an approved interpretation of TPL-002-0b the Transmission Planner has been designated as the responsible entity; however, Transmission and Generator Owners are required to support the development of the responses to the data request.

Schedule and Reporting

The completion of this survey and submission to NERC is due within twelve (12) months beginning the first day of the first month following NERC Board of Trustees approval and requires periodic reporting as defined in the following table.

Scheduled Reporting ²²	
1 st month	Starting point of the data request period
2 nd month	Transmission Planners must acknowledge the request for data

²¹ NERC Reliability Standard, TPL-004-0, System Performance Following Extreme Events Resulting in the Loss of Two or More Bulk Electric System Elements (Category D), Effective June 18, 2007 (<http://www.nerc.com/files/TPL-004-0.pdf>)

²² Periods are referenced from the first day of the first month following NERC Board of Trustees approval of the data request.

Scheduled Reporting ²²	
4 th month	Transmission Planners must report which step(s) are complete
7 th month	Transmission Planners must report which step(s) are complete
10 th month	Transmission Planners must report which step(s) are complete
11 th month	Electronic data reporting period opens (60 days)
Last day of the 12 th month	Transmission Planner data reporting must be complete

Dissemination of Data

Some of the requested information will contain Confidential Information as that term is defined by Section 1501 of the NERC Rules of Procedure. As such, NERC will handle that data in accordance with Sections 1500 and 1605 of the NERC Rules of Procedure. Submitting entities are encouraged to mark all confidential or critical energy infrastructure information as instructed in Section 1502.1 of the NERC Rules of Procedure to ensure that all sensitive information will be protected.

Burden to Entities

This data request will impose a substantial burden on the submitting entities. As stated above, the Transmission Planner will be responsible for the fulfillment of the data request, but the request will necessarily require coordination and cooperation between planning staff and protection staff. The planning and protection engineers that will need to conduct the studies and submit the data will often be working for different companies or business units. Therefore, adequate time must be made to accommodate data requests that cross company or unit lines.

The burden on Transmission Planners will be similar to the effort to simulate Category D contingencies in accordance with TPL-004-0.²³ In some cases, the Transmission Planner may have simulations from past studies that can be used to support this effort; however, that will depend on a number of factors including the extent to which a three-phase fault with protection system failure have been performed and evaluated as part of those Category D contingencies that would produce the more severe system results or impacts. The method defined in this data request has been developed to limit the burden on Transmission Planners while assuring the data collected is sufficient to address the potential reliability risk identified in Order No. 754. The SPCS reduced the burden on the Transmission Planners by requesting

²³ NERC Reliability Standard, TPL-004-0 — System Performance Following Extreme Events Resulting in the Loss of Two or More Bulk Electric System Elements (Category D)

simulations to be performed on a bus basis, rather than an element basis, and by limiting the buses of interest to the subset defined in Table A of the data request.

The burden on Transmission Owners and Generator Owners to support this effort will also be substantial as time will be required to provide fault clearing times to Transmission Planners and to review protection system drawings to assess where single points of failure exist. The method defined in this data request also has been developed to limit the burden on Transmission Owners and Generator Owners by limiting the elements for which protection system(s) must be evaluated and by only requiring entities to identify whether single points of failure exist in each component category, rather than documenting all single points of failure. Transmission Owners and Generator Owners are required to evaluate the protection system(s) only for locations on the system for which the Transmission Planner has identified that a protection system failure could result in a potential reliability risk. The burden will vary depending on factors such as how recently each protection system was installed or modified. For more recent installations or modifications there may be less work involved as entities will be more familiar with the protection system design and may require limited drawing review. Older installations are likely to require more time to review drawings to identify where single points of failure exist.

Organization Information and Approval

Transmission Planning Entity Contact Information			
Entity Name:			
Contact Name:		Office Phone:	
Title:		Cell Phone:	
Email:		NERC ID:	

Approval

To the best of my knowledge, the information provided in the response to this survey is correct.

Supervisor approving this survey:²⁴

Name:

Date:

Title:

²⁴ This approval should be completed by a company employee that is a supervisor-level or above and that has the ability to verify that technically-appropriate individual(s) completed survey item 1.