

Questions and Answers for the January 5 and 20, 2012 Webinars Order 754 – Data Request The Study of Single Point of Failure

Intent of the Request for Data or Information

Please provide the intent of the study. Is it to look at the impact of slower than normal clearing for bus and close-in faults?

The intent of the Request for Data or Information is to identify whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems. The concern identified in Order No. 754 is not limited to specific fault types; however, the Request for Information or Data is focused on bus faults with delayed clearing to minimize the burden on entities while collecting sufficient data to assess the potential scope of the reliability concern if one does exist. The owner will determine if single points of failures exist in the Protection Systems on buses, lines, transformers, and shunt devices at the substation and how these failure modes impact the clearing times. The simulated bus faults are representative of close-in faults on each connected Element, but the Request for Data or Information does not require close-in bus faults be simulated.

Please describe what will happen after the requested data has been submitted? For example, will NERC be analyzing, creating a report, and recommending corrective actions for the industry?

NERC's Reliability Assessment and Performance Analysis group will evaluate the data to determine the extent to which single point of failure of protection systems may have a negative impact on reliability. The evaluation will aid in determining steps, if any, to improve reliability as well as support an informational filing to FERC in response to Order No. 754.

It seems that the existing TPL standards are sufficient to cause transmission planners to evaluate system reliability without the need for the data requested. What area in the data request is not included in the existing TPL standards?

The existing TPL standards do not establish specific system performance standards for three-phase faults accompanied by a Protection System failure. Single-line-to-ground faults frequently evolve to a multi-phase fault when fault clearing is delayed due to a Protection System failure. This Request for Data or Information will provide data on the extent to which delayed clearing could lead to a significant system disturbance such as those identified in the March 2009 NERC Industry Alert. In cases where delayed fault clearing could result in a similar disturbance, the Request for Data or Information requires reporting of attributes of Protection

Systems and station dc supplies to assist in understanding the extent to which exposure exists to such disturbances.

Is the purpose of collecting transmission line redundancy information to find those areas where delayed clearing exists?

No. Delayed clearing of faults in and of itself does not create a reliability concern. The intent of the study is to identify where delayed clearing results in system performance that could lead to a significant system disturbance such as those identified in the March 2009 NERC Industry Alert. In cases where delayed fault clearing could result in a similar disturbance, the Request for Data or Information requires reporting of attributes of Protection Systems and station dc supplies to assist in understanding the extent to which exposure exists to such disturbances.

Applicability to Entities

To which NERC registrations does this request apply to? Does it only apply to Transmission Planners?

Will Transmission Owners and Generator Owners have to fill out a survey?

This Request for Data or Information identifies the Transmission Planner as the entity responsible for submitting the requested data. Transmission Owners and Generator Owners will not need to submit data directly to NERC. However, Transmission Owners and Generator Owners are expected to provide to their Transmission Planner(s) any information that is necessary for the Transmission Planner to respond to the Request for Data or Information.

Will the Request for Data or Information be sent only to registered Transmission Planners, or also to the Generator Owners and Transmission Owners?

The Request for Data or Information will be sent to Generator Owners and Transmission Owners to make them aware they are expected to provide to their Transmission Planner(s) any information that is necessary for the Transmission Planner to respond to the Request for Data or Information.

Is it necessary to collect generator data? The failure of generator protection is most likely to result in only the loss of the generator, which is already evaluated as Category B or Category C contingencies. Priority should be to collect Transmission Owner data, which will reduce the amount of effort and data to be collected.

The only data that will be collected from Generator Owners is related to generator step-up (GSU) transformers. The majority of data will be collected from Transmission Owners. The Request for Data or Information includes all Facilities connected to buses that meet the criteria in Table A, because a fault on any of the connected Facilities accompanied by a Protection System failure would have the same potential impact on system reliability.

What are the manpower burden and cost implications for Generator Owners? This seems extremely onerous for small generating stations

The burden for Generator Owners will not be significant as the only data the Generator Owner must provide to their Transmission Planner(s) is related to their generator step-up (GSU) transformers. The burden for Generator Owners will be proportional to the number of generators they have connected to buses that meet the criteria in Table A.

What specifically you are expecting from Generation Owners other than providing information to the Transmission Planners on the generator step-up (GSU) transformer protection?

Providing information to the Transmission Planners on the generator step-up (GSU) transformer protection is the extent of the expectation for Generator Owners.

Is the Protection Engineering Group defined as part of the Transmission Owner/Generator Owner or could it also be considered part of the Transmission Planner?

Whether a protection engineering group is part of a Transmission Owner, Generator Owner, or Transmission Planner will depend on the functions for which each entity is registered. Per the NERC Functional Model the Transmission Owner or Generator Owner has responsibility for Protection Systems associated with their Facilities and as part of this Request for Data or Information they are responsible for submitting data to their Transmission Planner. This reporting is required regardless of whether the Transmission Owner or Generator Owner is part of the same company as the Transmission Planner.

Applicability to the Bulk Electric System (BES)

Please confirm whether the Request for Data or Information is limited to the BES

The Request for Data or Information requests information for all Facilities operated at 100 kV or higher that meet the criteria in Table A, regardless of whether the bus would be considered part of the Bulk Electric System under the existing NERC glossary definition.

Presently, in the NPCC footprint the BES is considered to be limited to only the NPCC Bulk Power System (BPS), as defined by the A-10 test. Would this request for information be limited to the BPS buses for entities in NPCC?

The Request for Data or Information is independent of how any region presently defines the Bulk Electric System. If a bus meets the criteria in Table A, the Transmission Planner should include the bus per the method in the Request for Data or Information regardless of whether it meets the regional definition of a Bulk Electric System Element.

What if there is a 115 kV bus that meets the criteria in Table A that is not part of the BES?

If a 115 kV bus meets the criteria in Table A, the Transmission Planner should include the bus per the method in the Request for Data or Information regardless of whether it is considered to be part of the BES.

Responsibilities of Applicable Entities

Will the Request for Data or Information be sent to Canadian registered entities? Page 1 of the overview document states "The purpose of this survey is to solicit data and information from each Transmission Planner in the United States to . . ."

The data request will be sent to all registered entities in the United States and Canada. The overview in the final Request for Data or Information will be corrected.

Will this responding to this data request be mandatory?

Responding to the data request is mandatory for registered entities in the United States. It is not mandatory for registered entities in Canada, but Canadian entities are strongly encouraged to submit data so that decisions regarding this concern are based on complete data across North America.

Should Generator Owners and Transmission Owners wait until contacted by their Transmission Planner to take action?

The first step in the method defined in the Request for Data or Information is based on the Transmission Planner meeting with the Generator Owners and Transmission Owners in its transmission planning area. However, Generator Owners and Transmission Owners are not prohibited from beginning to collect the information described in the Request for Data or Information prior to being contacted by their Transmission Planner.

Are entities expected to review Protection System schematics and wiring diagrams to identify all possible single points of failure?

No, entities are expected to only review Protection System schematics and wiring diagrams for Facilities identified by the Transmission Planner in step 7. For the purposes of the Request for Data or Information it is not necessary to identify every single point of failure. Entities only need to review these diagrams to identify whether a single point of failure exists for each of the attributes in Table B. If a single point of failure is identified, further review is not required for that Element.

Definition of Single Point of Failure

Please define the term "single point of failure"

In general terms a single point of failure exists when failure of a single component can affect the operation of all protection systems applied on an Element(s). For the purposes of this Request for Data or Information, single point of failure would be reported whenever a protection system component does not meet one of the attributes defined in Table B.

Will the Request for Data or Information include single points of failure due to geomagnetic disturbance or other high impact, low frequency events?

No, this Request for Data or Information does not address single point of failure associated with geomagnetic disturbances or other high impact-low frequency (HILF) events.

Will the Request for Data or Information include single points of failure during maintenance periods which can be 2-3 days?

No, this Request for Data or Information only addresses conditions with Protection Systems in their normal operating state. It is recognized that single points of failure may exist during maintenance and testing that do not occur during day-to-day operation, but these single points of failure are not the subject of this Request for Data or Information.

We suspect that many single points of failure will include station batteries, VT's, and CT's. Is this what you are also expecting to find?

The intent of the Request for Data or Information is to identify whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems. The data collected will enable NERC to assess whether there is a reliability concern and if so, whether it is related to specific Protection System components. The data collection for station dc supplies, voltage transformers, and current transformers is designed to avoid skewing the data. For example, the request for voltage transformers and current transformers excludes common primary windings and the request for station dc supply requests additional information regarding alarming when only one station battery is used.

Simulations/Relation to Reliability Standards

What type of studies is the Transmission Planner required to perform – power flow, transient stability?

The method defined in the Request for Data or Information requires a transient stability simulation to identify the system performance for a three-phase fault. An explicit reference will be added to the final Request for Data or Information.

Don't the simulations defined in the data request align with an "extreme event" per TPL-001-2 which is not a design requirement? Why wouldn't non-performance be expected when the system is evaluated beyond design criteria?

It is correct that contingencies to be simulated for this Request for Data or Information would be classified as Category D contingencies in the existing Transmission Planning studies defined in TPL-004-0 and as extreme events in the new TPL-001-2 that has been filed with FERC. The simulated system performance under TPL-004-0 and TPL-001-2 would not be required to meet specific performance requirements. For this reason it is possible that simulated performance will not meet the requirements in Table C. The purpose of this assessment is to identify the extent to which such contingencies could result in system performance that could lead to a significant system disturbance such as those identified in the March 2009 NERC Industry Alert, and where the potential does exist for such system performance, the extent to which Protection Systems are designed to mitigate exposure to such system performance. This information will be used to assess whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems.

The performance requirements for this data request appear more stringent than the NERC Reliability Standards, which require performance for a single-phase fault with delayed clearing. If a bus fault doesn't meet the three-phase fault test, will it be repeated for a single-phase fault to see if it meets the NERC TPL Standards?

No. This Request for Data or Information will not request any information associated with whether an entity complies with existing NERC Reliability Standards. The requested data will be used to identify where delayed clearing results in system performance that could lead to a significant system disturbance such as those identified in the March 2009 NERC Industry Alert. In cases where delayed fault clearing could result in a similar disturbance, the Request for Data or Information requires reporting of attributes of Protection Systems and station dc supplies to assist in understanding the extent to which exposure exists to such disturbances. This data will aid in determining steps, if any, to improve reliability as well as support an informational filing to FERC in response to Order No. 754.

TPL-001-2 does not consider failure of a Protection System anymore; it considers failure of a non-redundant relay in P5. This appears to indicate that failure of a protection system is beyond the design criteria.

The new TPL-001-2 that has been filed with FERC requires consideration of a failure of specified protective relays and tripping relays under contingency P5. It is correct that the scope of this Request for Data or Information exceeds the criteria proposed in TPL-001-2. The purpose of this assessment is to identify the extent to which contingencies could result in system performance that could lead to a significant system disturbance such as those identified in the March 2009 NERC Industry Alert, and where the potential does exist for such system performance, the extent to which Protection Systems are designed to mitigate exposure to such system performance. This information will be used to assess whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems.

Has the NPCC A-10 BPS Criteria document been used as a reference in developing the testing method? Can entities use existing A-10 tests already performed within NPCC in fulfilling this request?

The NPCC A-10 document was not used as a reference in developing the testing method, but there are similarities between the method defined in the Request for Data or Information and the NPCC A-10 criteria document. Registered entities in NPCC will need to compare the method and results of their analyses performed in accordance with the NPCC criteria and determine the extent to which these simulations can be used to fulfill the requirements of this Request for Data or Information.

In the NPCC region, there is a Directory that discusses system protection design criteria. However, these criteria apply only to what NPCC defined as its Bulk Power System. Are you familiar with the Directory (i.e., Directory 4) and does this document address certain components of the request?

We are familiar with the criteria in NPCC Directory 4 and there are many similarities between the Protection System attributes defined in Table B of the Request for Data or Information and Directory 4. There also are differences such as Table B does not require consideration of physical separation of Protection System components. Registered entities in NPCC will need to compare their as-built Protection System designs against the attributes in Table B.

Will guidance be provided to specify which seasonal model(s) would be used for the simulations in steps 2 and 6 of the method? Would analysis of only the horizon year summer peak planning model be adequate for this screening?

Additional guidance regarding the study-year and season to be modeled will be provided in the final version of the Request for Data or Information.

In the case where the Protection System owner has a lot of transmission projects underway, should the system assessment be performed "as-is" or how it will be by the end of the reporting period. Otherwise it will present a moving target.

The Protection System information that Transmission Owners and Generator Owners submit to the Transmission Planner should be consistent with the year and season modeled by the Transmission Planner. Additional guidance regarding the study-year and season to be modeled will be provided in the final version of the Request for Data or Information.

Will a single point of failure be considered as a Category B contingency?

No. FERC Order No. 754 approved the interpretation of TPL-002-0 that states single points of failure in Protection Systems are not considered under Category B.

Method

Is the general concept to test ONLY buses in Table A and evaluate Table B based on the buses that meet Table A?

Attempting to summarize in one sentence the method defined in the Request for Data or Information neglects many important steps. It is important that entities follow the detailed method so all data submitted by the Transmission Planners will be on a common basis.

Rather than perform numerous studies, would it not be easier and faster to determine where redundant protection systems are lacking?

The Request for Data or Information has been designed to minimize the overall effort by registered entities and burden on the industry. While identifying where redundant Protection Systems exist would minimize effort for Transmission Planners, using an iterative approach minimizes the overall effort by both the Transmission Planners and the Transmission Owners and Generator Owners and introduces a performance assessment.

In the interest of minimizing impact to Transmission Owners and Generator Owners at the outset of the evaluation process, why is step 1 needed? What percentage of buses do you expect to exclude in this step? Would it not be simpler to test all buses that meet Table A and then examine exclusions using Table B on the list of buses that fail the criteria? Seems it would further reduce entity burden.

While this approach would minimize burden on Transmission Owners and Generator Owners, the method was developed with stakeholder input from the affected groups of entities to minimize the overall burden on industry. Step 1 is intended to take advantage of the Transmission Owner's and Generator Owner's at-hand knowledge about the Protection Systems and should minimize the number of buses to be tested by the Transmission Planner without significant burden on the Transmission Owners and Generator Owners. The number of buses that may be excluded in step 1 will vary depending on existing design practices, but may be significant in some areas.

Step 1 of the evaluation method excludes buses to be tested if the Protection System meets the attributes in Table B. However the wording in Step 2 requires the Transmission Planner to study those busses identified in Step 1 "based on the Owner confirming that the protective system meets the attributes in Table B." These two steps appear to be contradictory.

The intent of step 1 is to create a list of buses to be tested starting from a list of all buses that meet the criteria in Table A, and removing from the list any buses for which Protection Systems on all connected Facilities 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). This intent is not reflected in the posted draft of the Request for Data or Information, leading to the identified contradiction. Steps 1 and 2 of the process will be revised in the final Request for Data or Information to rectify this contradiction.

Step 1 of the evaluation method calls for identifying transformers with through-fault protection. Please confirm whether a transmission transformer differential protection that trips remote terminals via direct transfer trip (DTT) is considered to provide through-fault protection.

Through-fault protection is applied to protect a transformer from the effects of through-fault current for a fault external to the transformer. Since the DTT in this case would operate for faults internal to the transformer differential zone, this would not be considered through-fault protection.

Step 2 and step 6 of the evaluation method requires simulation of a three-phase bus fault. What about end-of-line faults for which remote backup may not operate? For generator step-up (GSU) transformers, is the fault location of concern limited to an external fault on the high-voltage side or does it include internal transformer faults?

For the purpose of this Request for Data or Information it is not necessary to consider end-of-line faults. The intent of the Request for Data or Information is to identify whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems. The concern identified in Order No. 754 is not limited to specific fault types; however, the Request for Information or Data is focused on close-in faults with delayed clearing to minimize the burden on entities while collecting sufficient data to assess the potential scope of the reliability concern if one does exist.

This Request for Data or Information only requires simulation of bus faults as described in the method, which address faults on the terminals of equipment (e.g., the high-voltage side of a generator step-up (GSU) transformer). Internal transformer faults are not considered as part of this Request for Data or Information to minimize the burden on entities while collecting sufficient data to assess the potential scope of the reliability concern if one does exist.

Is it possible to clarify how to treat, for example, a breaker-and-a-half bus within the testing method? Please confirm that the assumption in step 2 should be that no local breakers would operate?

In the testing method the Transmission Planner would model fault clearing based on no local breakers operating. The Transmission Owner or Generator Owner would determine how single points of failure on the protection systems applied on the breaker-and-a-half configuration would impact remote clearing times. Additional explanation will be added to the final Request for Data or Information.

In step 2 and step 6, if the Protection System design includes fully redundant protection schemes but the breakers only have a single trip coil with a breaker failure scheme, is it necessary for the Transmission Planner to simulate tripping remote terminals of all lines, or can tripping be limited to only those lines associated with the breaker failure scheme operation? Can local breaker failure be considered during the testing, since battery failure is excluded?

The simulation specified in the Request for Data or Information was developed to be independent of the Protection System design and intended to consider tripping of all connected

circuits at the remote terminals. This method has been developed to minimize the burden on entities while collecting sufficient data to assess the potential scope of the reliability concern if one does exist. Simulation of remote clearing would be necessary when a single point of failure would prevent both breaker tripping and initiation of breaker failure protection. However, this question raises for consideration whether breaker failure protection should be considered when the only single point of failure of the Protection Systems connected to a given bus are the breaker trip coils. In this case consideration could be given to modifying the method to allow the Transmission Planner to assess performance based on the actual protection system operation or the tripping as performed by the breaker failure scheme. Entities who believe breaker failure protection should be considered in the evaluation method may submit comments on this subject during the 45-day comment period that ends on February 6, 2012.

In step 2 and step 6 when considering transformer protection, is it correct to assume that transformer fault clearing should be simulated based on how the transformer protection would respond for the simulated three-phase bus fault? Specifically if the bus fault is in the transformer differential zone should the transformer differential protection be assumed to provide through-fault protection for the simulated bus fault?

No, for the purposes of this Request for Data or Information the transformer differential should not be considered to provide through-fault protection. The bus fault defined in the testing method has been selected to minimize the burden on Transmission Planners and is representative of a close-in fault on any Element connected to the bus. While the transformer differential would operate for the bus fault, it would not operate for close-in faults on the other Facilities connected to the bus. This point will be clarified in the final Request for Data or Information.

If the Request for Data or Information excludes transformers with only one winding operated at 100 kV or higher (a two-winding step-down transformer for example), how does the evaluation method consider a fault in the transformer protection zone that is not detected by the bus protection. A specific example would be dual bus protection schemes and a single transformer protection scheme with the overlap point at the bus – supplies to such a transformer could be in the transformer zone but the impact on the system would be no different than a fault in the bus zone.

The Request for Data or Information excludes transformers with only one winding operated at 100 kV or higher, that are not generator step-up (GSU) transformers, only for the purpose of identifying buses that meet the criteria in Table A. These transformers are to be included in the data provided regarding Protection Systems that meet the attributes in Table B if they are connected to a bus identified by the Transmission Planner in step 7. The bus fault defined in the testing method has been selected to minimize the burden on Transmission Planners and is representative of a close-in fault on any Element connected to the bus. While the transformer differential would operate for the bus fault, it would not operate for close-in faults on the other Facilities connected to the bus and it would be considered to not operate in the simulation. This point will be clarified in the final Request for Data or Information.

Would bus protection redundancy only be an issue if the bus truly is a straight bus or breaker-and-a-half bus?

Failure of bus protection would result in remote clearing of Elements for any physical configuration in which bus protection is applied (e.g., straight bus, breaker-and-a-half, and double-bus-double-breaker). For the purpose of providing data for the “Buses” tab in the reporting template, information on bus protection attributes would not be relevant for bus configurations in which bus protection is not applied, as may be the case for a ring bus depending on design practices.

Table A

When Table A refers to circuits, e.g., the second row refers to “Buses operated at 100 kV to 200 kV with 6 or more circuits,” does circuits mean transmission lines or elements?

As described in the note below 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.

Would a substation with three circuits connected at 345 kV and five circuits connected at 115 kV meet the criteria in Table A?

The substation described would not require testing of the 345 kV bus. Testing of the 115 kV bus would be required only if a fault on the bus will result in 300 MW or more of consequential load loss as a result of remote clearing.

A 100kV line could be a radial line. Is this counted as a circuit?

Under the present draft of the Request for Data or Information a radial line at any voltage 100 kV or higher would be counted as a circuit for the purpose of identifying buses that meet the criteria in Table A. Entities who believe radial lines should be excluded may submit comments on this subject during the 45-day comment period that ends on February 6, 2012.

When counting circuits for Table A, are transformers counted as circuits. When looking at a 115 kV bus, if there are four lines and two distribution transformers connected, does that meet the threshold of Table A?

For the purposes of identifying buses that meet the criteria in Table A, transformers are counted as circuits only if the transformer is (i) a transformer with the primary terminal and at least one secondary terminal operated at 100 kV or higher, or (ii) a generator step-up (GSU) transformer. A bus with four 115 kV transmission lines and two distribution transformers that step down to a voltage level below 100 kV would have four circuits connected. This example would meet the criteria in Table A only if a fault on the bus will result in 300 MW or more of consequential load loss as a result of remote clearing.

For a substation with an autotransformer, would Table A apply for each voltage level?

The reporting template applies for each voltage level at a substation that meets the testing requirements in Table A. For example, testing would be required at 500 kV and 230 kV for a substation with three 500 kV transmission lines, three 230 kV transmission lines, and a 500/230 kV autotransformer, because both the 500 kV and 230 kV buses would have four circuits connected as defined in Table A.

If a transformer has both sides connected at 100 kV or higher, when counting the 'number of circuits' is the transformer counted at both the high and low voltage 'buses' or just the high-side bus? For example, on slide 18, does transformer T1 count as a 'circuit' for both the 345 kV and the 138 kV bus?

A transformer connected to two buses at 100 kV or higher would be counted for determining whether each of the buses meet the criteria in Table A; i.e., the transformer would count as a circuit for the high-voltage bus and also would count as a circuit for the low-voltage bus. For example, Transformer T1 on slide 18 would be considered a circuit connected to the 345 kV bus and also as a circuit connected to the 138 kV bus.

Would the 115/25 kV distribution transformer in the ring bus example on slide 17 NOT be counted as a circuit connected to the 115 kV bus, thereby resulting in five applicable circuits, and thereby excluding the 115 kV bus?

The 115/25 kV transformer would NOT be counted as a circuit for the purpose of determining whether the 115 kV bus meets the criteria in Table A. However, the bus would be included as meeting the criteria since there are six circuits connected to the bus: five transmission lines and one 230/115 kV transformer.

In slide 17 is T3 counted as a circuit in applying Table A? Is it a 'step-down' transformer?

Transformer T3 on slide 17 is a step-down transformer supplying a customer's facilities and would not be counted as a circuit for the purpose of determining whether the 115 kV bus meets the criteria in Table A.

Is there a minimum size GSU to be counted as a circuit?

No, a minimum MVA threshold has not been established for identifying whether a generator step-up (GSU) transformer is to be counted as a circuit for the purposes of identifying buses that meet the criteria in Table A. Entities who believe an MVA threshold should be established may submit comments on this subject during the 45-day comment period that ends on February 6, 2012.

Do capacitor banks and reactors fall under the term "circuits" for Table A?

Capacitor banks and reactors are not considered to be circuits for the purposes of applying Table A. However, Protection System attributes are to be reported for buses that meet the criteria in Table A that are identified by the Transmission Planner in step 7.

It would be a good idea to give some example figures showing how to count up elements and determine whether a station is required to be analyzed or not.

Example figures will be added as an appendix to the Request for Data or Information to provide additional clarity.

Table B

How should entities consider single points of failure that may affect two or more systems of protection resulting from insufficient separation; e.g., redundant relays on a common rack, redundant control circuits in a common cable tray, conduit, duct bank, or redundant control circuits in a common multi-conductor cable?

For the purposes of the Request for Data or Information it is not necessary to consider physical separation of protection system components such as protective relays or dc control circuitry.

How should entities consider single points of failure if a line is protected by two relays, but the relays are identical? To be considered two independent protective relays must the relays be from two different manufacturers? Does the NERC Request for Data or Information consider this a single point of failure?

For the purposes of the Request for Data or Information it is not necessary to consider whether two protective relays associated with an Element are identical, or whether they have the same manufacturer or algorithm for fault detection.

Are two breaker trip coils required for independence?

Yes, for the purposes of this Request for Data or Information the dc control circuitry must include two trip coils to meet the Protection System attributes in Table B. However, depending on the failures mode and resulting trip times, two trip coils may not be necessary to meet performance requirements.

What about the failure of the communication box into which primary and redundant/backup protection systems terminate?

This would be considered a single point of failure for determining whether the Protection System meets the attributes for communication systems in Table B if communication between protective relays is needed to satisfy BES performance required in the existing Transmission Planning standards.

Table C

For the evaluation, what is meant by "could result in a potential reliability risk?" Does this mean cascading outages, voltage collapse, transient instability, violation of established SOL/IROLs, other?

For the purpose of this Request for Data or Information, a potential reliability risk would exist when the simulated system performance does not meet the performance measures in Table C.

Is the intent of these simulations to identify only system instability due to a potential single point of failure in the Protection System? The Request for Data or Information does not mention reliability concerns such as overload or low voltages? It appears that stability, not steady state, is applicable to this approach, correct?

The performance requirements for this Request for Data or Information were developed based on avoiding significant system disturbance such as those identified in the March 2009 NERC Industry Alert. Evaluation of thermal loading and voltage performance is not required. Transient stability analysis will be necessary to assess whether simulated system performance violates the requirements in Table C.

Are load shedding schemes allowed to maintain stability?

The draft Request for Data or Information does not prohibit modeling existing load shedding schemes that may operate in response to the simulated three-phase fault conditions. Entities may submit comments on this subject during the 45-day comment period that ends on February 6, 2012.

Regarding item 2 bullet 4 and Table C, how can these performance measures be exceeded? The "or more" language is confusing in items 2 and 3. Would it be better to state in item 2, bullet 5 that the results do not meet at least one of the performance measures?

Yes. This recommendation will be incorporated in the final version of the Request for Data or Information.

Why was 1000 MW of generation chosen as a criterion in Table C, especially if the system remains stable? Our largest power plant is greater than 1000MW, which is already covered under a NERC B

The 1000 MW threshold is based on Event Category 3 in the Phase 2 Field Test draft Electric Reliability Organization Event Analysis Process. Tripping a generator for a Category B single-line-to-ground fault is a less severe condition than loss of 2000 MW of generation in the Eastern or Western interconnection or 1000 MW of generation in the ERCOT or Québec interconnection resulting from a three-phase fault accompanied by a Protection System failure.

Could you provide a conceptual example of how one would identify the second performance measure in Table C which refers to island formation of 1,000 MW or higher.

Formation of an island in a stability simulation may be identified, for example, by monitoring the apparent impedance on transmission lines to identify whether lines may trip as the result of a power swing. When this occurs the contingency may be re-simulated with the line tripping and an assessment made of resulting islands. Transient stability programs include screening tools for such analyses. The Request for Data or Information does not specify how the Transmission Planners are to perform this assessment to allow them to utilize the techniques they find most useful.

Table D

Please define specifically what Table D means when referencing 'two independent station dc supplies.' If one has one charger, one set of batteries, with separate dc panels feeding the independent relay systems and trip coils, is that considered 'independent' dc supplies? This directly effects how Table B 'DC Control Circuitry' is used in selecting buses to be evaluated.

The station dc supply consists of a charger and battery, or other dc source that is used for powering the Protection Systems and used for tripping; it does not include the dc distribution panels. In the example provided, the one charger and one set of batteries would be a single dc source. For the purpose of the Request for Data or Information, the separate dc panels feeding the independent relay systems are part of the dc control circuitry. When applying Table B to determine whether a Protection System meets the attributes for independent dc control circuitry it is not necessary to consider the station dc supply. If in the example provided the dc control circuitry, auxiliary relays, and trip coils are independent, the dc control circuitry would meet the attributes in Table B regardless of the station dc supply. Considerations for the station dc supply are in a separate table to avoid influencing the buses to be evaluated. Additional clarification will be added to the Request for Data or Information.

What is the purpose of the dc supply attribute reporting? These attributes are not included in any of the simulations.

Station dc supply failures are not included in the screening to identify buses to be tested because two independent station dc supplies is believed not to be a common design practice. Rather than include station dc supply attributes in identifying buses to be tested, the Request for Data or Information requests reporting of station dc supply attributes separate from the Protection System attributes.

Reporting

Are the periodic status reports and data requests coordinated by the Regions, or are the reports going directly to NERC Staff?

Periodic status reports along with the actual data submittal will be directed to NERC. At the appropriate time(s) based on the schedule a web-based application will be made available for Transmission Planners to submit their reports and data.

The data gathered is highly critical to the operation of the power system. Who will have access to this data? How will it be secured from unintended access?

NERC will aggregate the data supplied by each entity for analysis. The result will not be entity specific and will be presented in such a manner as not to identify entities or vulnerabilities. In teams of access, the appropriate NERC staff will have access to the data for analysis and reporting. The collected data will be secured within NERC's secure resources.

Does the Request for Data or Information ask for the level of burden for the entities? This is not a question on the Comment Form.

The Request for Data or Information does not request entities to report on the level of burden for entities. To the extent registered entities believe the burden will be significant or require more time than proposed in the draft Request for Data or Information, entities may submit information on this subject during the 45-day comment period that ends on February 6, 2012.

The survey should include reporting on the attribute of Table B that causes the performance issue so that there can be a priority to rectify.

The intent of the Request for Data or Information is to identify whether there is a reliability concern associated with the assessment of single points of failure on Protection Systems. The method in the request has been designed to mitigate the burden on entities and as such will not provide information regarding which specific Protection System attributes may cause specific performance issues. However, the data collected will include the Protection System attributes where potential reliability risks exist to assist NERC in assessing whether there is a reliability concern and if so, whether it is related to specific Protection System components.

In the reporting template, is the tab labeled "Step Down Transformers" for reporting information on distribution transformers?

The tab labeled "Step-Down Transformers" would include reporting for distribution transformers that step voltage down from a voltage 100 kV or higher to a voltage below 100 kV. However, this tab is not exclusively for distribution transformers. This tab also will be used for collecting data on other transformers that step voltage down from a voltage 100 kV or higher to a voltage below 100 kV, such as those supplying sub-transmission networks, auxiliary power during start-up and shut-down of generators, or off-site power to nuclear generating stations. A clarifying note will be added to that tab.

What documentation is needed by NERC to prove a system is fully redundant and therefore should be excluded from the bus list?

Supporting evidence is not required to support responses to this Request for Data or Information.

Table B does not provide enough examples and detail to determine if protections system attributes that need to be evaluated meet single point of failure requirements in Table B? Will there be additional guidelines or appendices to clarify these details?

Examples will be added to the final version of the Request for Data or Information.

Schedule

When do you anticipate the actual data request will be due to NERC?

The requested data will be due to NERC 12 months after the Request for Data of Information is sent to registered entities. The anticipated due date will be on or around April 1, 2013.

The last page of the Request for Data or Information draft is a form which requests Transmission Planning Entity Contact Information. What is the deadline for this form? Is this the form that has to be filled out as acknowledgement of the request for data by the 2nd month of the schedule?

NERC will be providing the responsible entities an electronic method to enter their respective contact information concerning the data request by the 2nd month. Each entity may be provided an electronic approval process to complete their data submittal in the last 60 days of the period; however, each entity will be required to submit the approval form of the data request to NERC using the supplied address near the beginning.

The requirement is to accomplish this task in one year. If it takes Transmission Planning most of that time to identify the buses and elements that need to be reviewed, there would be little time left for the Transmission Owners and Generator Owners to finish their review. The Transmission Owners and Generator Owners may need additional time to accomplish their review beyond the one-year time frame.

The schedule in the draft Request for Data or Information is intended to provide Transmission Planners adequate time to work interactively with their Transmission Owners and Generator Owners. Entities that have concerns with the schedule may provide comments, including details of concerns and proposals for mitigation, during the 45-day comment period that ends on February 6, 2012.

General

Where on NERC's site will information be posted?

The streaming webinar and a copy of the presentation slides are posted on the NERC website at <http://www.nerc.com/page.php?cid=1183> under the tab titled "2012 Webinars." This page can be reached from the main NERC website page by clicking on the "Webinars" button on the right side of the page. Other information related to FERC Order No. 754 is posted on the NERC website at http://www.nerc.com/filez/standards/order_754.html.

Many of the hyperlinks in the Request for Data or Information do not work and URLs are not provided. It will be beneficial if they work.

The hyperlinks in the document will be updated in the final version of the Request for Data or Information. In the interim, the following hyperlinks and URLs are provided for the missing hyperlinks:

NERC SPCTF technical paper, Protection System Reliability – Redundancy of Protection:
http://www.nerc.com/docs/pc/spctf/Redundancy_Tech_Ref_1-14-09.pdf.

NERC Reliability Standard TPL-001-2, Transmission System Planning Performance Requirements:
<http://www.nerc.com/files/TPL-001-2.pdf>.

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

Please confirm that the Request for Data or Information instructions have precedence over the notes in the data reporting template (Excel spreadsheet) if conflicts exists.

The instructions in the Request for Data or Information have precedence of the notes in the template. Entities who believe there are conflicts between the instructions in the Request for Data or Information and the reporting template may submit comments on this subject during the 45-day comment period that ends on February 6, 2012. NERC will address all identified conflicts prior to issuing the final Request for Data or Information.

The lead in at http://www.nerc.com/docs/standards/dt/Order_754_-_Data_Request_Outline_DRAFT_2011_12_01.pdf states “violations of applicable thermal or voltage ratings”. Is the use of the term ‘violations’ correct in this context (what NERC performance criteria is being violated)?

The referenced document was a working draft outline used during development of the Request for Data or Information. Subsequent to developing the referenced outline, the performance criteria were modified as presented in Table C. The Request for Data or Information does not require consideration of applicable thermal or voltage ratings.