Background
The objective of this proposal is to outline an approach to develop a method toward measuring of Reliability Standard implementation costs. Federal, State and Provincial regulatory authorities, the NERC Board of Trustees, Regional Entities, and many industry stakeholders have expressed interest in the identification of the costs incurred from implementing NERC Reliability Standards compared to risks addressed. The desire is to balance costs and risks during the standards development and revision process.

In the past, determination of the costs from the implementation of NERC Reliability Standards was implicitly considered throughout the standards development process. Through this process, detailed comments are sought and modifications to proposed standards are made based on input from the standards ballot pool, which represents a cross-section of interested participants. However, some entities have requested a more direct assessment of costs, citing a number of different reasons. For example, registered entities have identified the need to estimate implementation costs for budgeting and rate case development. Further, many state regulators would like this information to determine consumer costs implications.

The actual cost to implement a Reliability Standard may be difficult to estimate. In general, registered entities vary in their operations, vulnerabilities, and starting points from which to calculate incremental costs. Hence, the costs for Reliability Standard implementation may vary by orders of magnitude by entity.

Consideration of Risks to Reliability
NERC has transitioned to include risk analysis in all aspects of its regulatory model, focusing the Electric Reliability Organization’s (ERO) and stakeholder resources on the highest risks to the reliability of the Bulk Electric System (BES).

Proposed Pilot for Developing Cost Evaluations during Standard Development
The proposal for developing cost evaluations during standard development is as follows. A voluntary questionnaire will be provided to industry participants in order to obtain sufficient information to develop a high level analysis of the risk reduction to the BES under consideration, as well as the potential costs (e.g. monetary and societal) of not addressing the reliability risks. This questionnaire will be conducted prior to, or in conjunction with, the standard authorization stage (SAR) stage of standard development. If, during the
development of a SAR, the drafting team believes there is a need to pose questions to the industry during the drafting phase, it may identify the reliability risk being mitigated and provide industry the opportunity to identify alternate methods to be captured in the standard that may achieve the reduction in risk to the BES in a cost effective manner. If conducted prior to the development of the SAR, questions could be developed in a similar manner to obtain information that may provide insight on SAR development options.

**Initial Pilot**

There are two outstanding directives from FERC Order No. 786 relating to TPL-001-4 — Transmission System Planning Performance Requirements.

- Paragraph 40 directs NERC to modify Reliability Standard TPL-001-4 to address the concern that the six-month threshold could exclude planned maintenance outages of significant facilities from future planning assessments.
- Paragraph 89 directs NERC to consider a spare equipment strategy for stability analysis that is similar to that required for steady state analysis upon the next review cycle of Reliability Standard TPL-001-4.

**Project 2015-10: Single Points of Failure TPL-001** from the 2016-2018 Reliability Standards Development Plan is developing a SAR to address potential modifications to TPL-001-4. The results of this pilot will be provided to the drafting team to inform their work on modifying this standard. The following questions are provided to obtain information about risks and costs related to the two directives above.

**Questions**

1. Reliability Standard TPL-001-4 requires an entity to consider planned maintenance outages greater than six months in duration in its studies. What, if any, risk is there to the reliable operation of the Bulk Power System (BPS), as defined in Section 215 of the Federal Power Act (i.e., “operating the elements of the bulk-power system within equipment and electric system thermal, voltage, and stability limits so that instability, uncontrolled separation, or cascading failures of such system will not occur as a result of a sudden disturbance . . . or unanticipated failure of system elements”) if planned maintenance outages of less than six months in duration are not considered in studies during one or both seasonal off-peak periods? Please explain your response:

ISO-NE, one of our member organizations, agrees with the Commission’s concern that registered entities should have the capability and authority to study the reliability impacts of planned maintenance outages scheduled greater than 12 months in advance of the proposed outage date. ISO-NE does not agree, however, that such outages should be considered in TPL-001-4 studies. Based on ISO-NE’s experience, it would not be cost-effective to establish a new requirement in TPL-001-4 to consider such outages, but NERC might consider expanding the application of IRO-017-1 to outages planned outside of Operations Planning Horizon.

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By way of context, in New England, Transmission Owners have submitted nearly 50K outage requests since 2008, and Generation owners have submitted nearly 30K requests since 2011, to ISO-NE. ISO-NE’s outage coordination process covers outage requests made up to 24 months in advance of the proposed start date. ISO-NE studies the reliability and congestion impacts of proposed outages, and under its process, ISO-NE has the authority to approve, delay or deny the outage depending on whether adverse reliability or economic impacts would otherwise occur.

In the timeframes noted above, ISO-NE has therefore assessed the reliability and congestion impacts of tens of thousands of transmission and generation outage requests – for about 1500 of those, the TO or GO submitted the request over 12 months in advance of the proposed outage date. In administering its program, ISO-NE has avoided adverse reliability impacts that would have resulted from the transmission or generation element being removed from service on the schedule that was initially proposed. And, ISO-NE’s repositioning of outages has saved consumers approximately $200M over the last 10 years. For more details, see ISO-NE’s Annual Report on Outage Coordination at http://www.iso-ne.com/static-assets/documents/2016/05/2015-isone-transmission-equipment-outage-coordination.pdf

Adding a requirement to study planned maintenance outages as part of the TPL assessment is therefore an unnecessary added burden. ISO-NE already accomplishes the same purpose through its Outage Coordination program. If NERC and FERC have a concern that some registered entities are not assessing the reliability impacts of planned maintenance outages that are being scheduled over 12 months in advance with less than 180 day duration, Reliability Standard IRO-017-1 (going into effect 4/1/17) could be modified to require the RC, BA and TOP to assess planned maintenance outages in the Near-Term Transmission Planning Horizon in addition to the Operations Planning Horizon.

Addressing reliability risks associated with planned maintenance will be cost-effective through an Outage Coordination program, such as the one administered by ISO-NE (and as contemplated by IRO-017-1). This approach also avoids disruption to the long-term system planning assessment under TPL-001-4 for several reasons, including:

- The iterative process of scheduling and approving outages requires a high degree of communication and coordination up to and including Real-time. Operations personnel have developed the experience, tools, procedures and process needed to manage and minimize reliability and economic impacts associated with planned outages. IRO-017-1 requires the development of a process, communication and resolution of identified conflicts.
- In contrast, studies under TPL-001-4 are typically done by system engineers doing relatively static studies on a relatively known system, and publishing a needs assessment. Requiring such an assessment under TPL-001-4 would simply be an additional step to what outage coordinators need to do anyway.

In sum, there is no risk to the reliable operation of the Bulk Power System if outages less than six months in duration are not considered in studies associated with TPL-001-4 so long as an outage coordination process is in place. When outages are coordinated (as all relevant registered entities must do under IRO-017-1 starting in April 2017) these registered entities should ensure that the
reliability of the BPS is maintained under these conditions. Evaluation of these shorter duration outages in the context of TPL-001-4 is not a meaningful exercise.

a. If there are risks to the reliable operation of the BPS, are the likelihood of the occurrence of these risks low, medium or high?

The reliability risk is extremely small based on ISO-NE’s exercise of outage coordination authority and established process of managing reliability and economic impacts.

Please explain your response:

b. What costs should be considered when evaluating these risks or in adding planned maintenance outages less than six months to TPL-001-4? Please explain your response:

There is the direct cost of conducting a study of planned maintenance conditions under TPL-001-4 knowing that the study will take into account conditions that may not materialize in the Operation Planning horizon operations staff address in Real-time. That is why outage coordination as administered by ISO-NE for the last 10 years, and what will be required of other System Operators under IRO-017-1, is necessary.

c. If you identified one or more risks and identified a likelihood of “medium” or “high”, is there a more cost effective manner to reduce them rather than revising TPL-001-4 or is there an preferred approach to revising TPL-001-4 that takes into consideration cost effectiveness?

☐ Yes
☐ No

Please explain your response including descriptions of potential cost effective solutions and the associated benefits to reliability:

2. What, if any, risk to the reliable operation of the BPS, as defined under Section 215 (see question 1 above) is there if an entity does not perform stability analyses for the P0, P1 and P2 categories in TPL-001-4 that consider the possible unavailability of long lead-time equipment? Please explain your response:

a. If there are risks to the reliable operation of the BPS, are the likelihood of the occurrence of these risks low, medium or high?

Please explain your response:
b. What costs should be considered when evaluating these risks? Please explain your response:

c. If you identified one or more risks and identified a likelihood of “medium” or “high” is there a cost effective manner to reduce them rather than revising TPL-001-4 or is there an preferred approach to revising TPL-001-4 that takes into consideration cost effectiveness?

☐ Yes
☐ No

Please explain your response including descriptions of potential cost effective solutions and the associated benefits to reliability: