

Revision to the ISO Transmission Planning Standards Revised Straw Proposal

Neil Millar – Executive Director, Infrastructure Development Robert Sparks – Manager, Regional Transmission - South Jeff Billinton – Manager, Regional Transmission - North

June 4, 2014



Revision to ISO Planning Standard Stakeholder Process





Scope of Changes to ISO Transmission Planning Standards

- The ISO is proposing to modify the ISO Planning Standards to clarify and codify existing policy applications in the standards as well as updates due to changes within the NERC Transmission Planning (TPL) standards.
- The three areas that the ISO is planning on making the specific changes to Planning Standards are as follows:
 - Non-consequential load shedding for Category C contingencies
 - Extreme Event mitigation for San Francisco Peninsula area
 - Changes to align with evolving NERC Transmission Planning Standards (TPL)



ISO Planning Standards

- Planning standards are critical to providing reliable service to customers.
- Form the foundation or basis for all planning activities.
- ISO required to adhere to:
 - NERC Reliability Standards
 - WECC regional standards, criteria and business practices
- ISO's FERC-approved tariff provides for the approval of Planning Standards by the ISO's Board of Governors, which provides the necessary vehicle for needs specific to the ISO controlled grid to be properly addressed in ensuring acceptable system reliability.



Non-consequential load shedding for Category C Contingencies



Scope of Category C Load Shedding

- The ISO is intending to provide further clarity in the ISO Planning Standards regarding when load shedding through Special Protection Systems is considered an acceptable means to address planning needs for Category C contingencies.
- The ISO Planning Standards currently provide guidelines regarding system implications of SPS operation and SPS design considerations that need to be taken into account,
 - but do not currently address the current and historical practices regarding considerations of non-consequential load shedding for Category C contingencies.



Current and Historical Practices re Category C Load Shedding

- The ISO's current practice in local area planning, which is consistent with historical practices prior to and since the creation of the ISO, is to not rely upon high density urban load shedding as a long term planning solution for Category C contingencies.
 - this practice has not previously been codified in the ISO Planning Standards
 - further clarification of the considerations in the viability of load shedding as a short term measure, or in lower density areas is also being considered.



Comments on Draft Straw Proposal:

- Need to refine the definition of "high density urban areas"
 1000 persons/square-mi is too general
- Emphasis on "benefit to cost ratio" as ultimate metric
- Proposal for a MW threshold alternative
- Exceptions for high cost transmission upgrades



Language to be added to ISO Planning Standard

- The local areas are planned to meet the minimum performance established in mandatory standards or other historically established requirements, but tend to have little additional flexibility beyond the planned-for requirements taking into account both local generation and transmission capacity. Increased reliance on load shedding to meet these needs would run counter to historical and current practices, resulting in general deterioration of service levels.
- For local area long-term planning, the ISO does not allow nonconsequential load dropping in high density urban load areas in lieu of expanding transmission or local resource capability to mitigate NERC TPL-001-4 standard P1-P7 contingencies and impacts on the 115 kV or higher voltage systems.



Language to be added to ISO Planning Standard (continued)

- In the near term during short-term planning, SPS which drops load, including high density urban load, may be used to bridge the gap between real-time operations and the time when system reinforcements are built.
- In considering if load shedding is a viable mitigation in either the shortterm, or the long-term for local areas that would not call upon high density urban load, case-by-case assessments need to be considered. Assessments should take in consideration, but not limited to, risk assessment of the outage(s) that would activate the SPS including common right of way, common structures, history of fires, history of lightning, common substations, restoration time, coordination among parties required to operate pertinent part of the transmission system, number of resources in the area, outage history for resources in the area, retirement impacts, and outage data for the local area due to unrelated events.



Language to be added to ISO Planning Standard (continued)

- **High Density Urban Load Area**, is an Urbanized Area, as defined by the US Census Bureau, with a population over one million persons.
 - Applying Census definition of Urbanized Area (UA):
 - A statistical geographic entity consisting of a densely settled core created from census tracts or blocks and contiguous qualifying territory that together have a minimum population of at least 50,000 persons.



Extreme Event Mitigation for San Francisco Peninsula Area



Recognition of unique considerations necessary for Sn Francisco Peninsula Area

- There are unique circumstances affecting the San Francisco area that form a credible basis for considering mitigations of risk of outages and of restoration times that are beyond the reliability standards applied to the rest of the ISO footprint.
- The Peninsula area does have unique characteristics in the western interconnection due to:
 - the urban load center,
 - geographic and system configuration, and
 - potential risks with challenging restoration times for these types of events.



Recommendation being developed for ISO Planning Standards for San Francisco Peninsula

- The ISO is therefore proposing to add to the Planning Standards specific recognition of the unique characteristics of supply to the San Francisco Peninsula and acknowledgment that planning for extreme events – including the approval of transmission solutions to improve the reliability of supply - is an appropriate action for the ISO Board to consider and approve.
- <u>Note</u> proposal does not mandate a specific level of enhanced service nor a particular reinforcement – but establishes reasonable framework for Board to consider recommendations as a part of the ISO Transmission Planning Process.



Comments on Draft Straw Proposal::

- Should this be broadened to be a new criteria that applies more broadly than to the Peninsula?
- Many comments on the planning exercise that is proceeding in parallel (continuing on from 2013-2014 TPP)
- Emphasis on "benefit to cost ratio" as ultimate metric
- Suggested reliance on renewables



Unique Characteristics of San Francisco Peninsula

- The unique characteristics of the San Francisco Peninsula area are illustrated throughout Appendix D of the ISO 2013-2014 Transmission Plan.
- The ISO has created a separate document, from information of Appendix D, to illustrate the unique characteristics of the Peninsula area.
 - The information contained in the description of the Peninsula area and risks has been determined to be critical information and as such will be posted on the ISO Market Participant Portal with access subject to a Transmission Planning NDA.



2014-2015 Transmission Planning Activities

- In parallel and complementary to the unique classification of the San Francisco Peninsula in the ISO Planning Standards, <u>the ISO is</u> <u>continuing the assessment of potential mitigation for Extreme Events</u> <u>within the 2014-2015 TPP and will engage stakeholders on the</u> <u>potential mitigation assessment within that process</u>.
- The ISO has engaged consulting services to assess in two phases:
 - Phase 1 Development of an assessment methodology that evaluates risks and benefits of proposed mitigation strategies, and
 - Phase 2 Application of the methodology to evaluate risks and benefits of the proposed mitigation option.
- The study will consider various magnitudes of seismic events in the area of the San Francisco Peninsula and the potential impact of those seismic events on the electric to quantify the potential risks and benefits of identified capital projects as determined by the projects' impact on system reliability following a seismic event.

Language to be added to ISO Planning Standard

- The ISO has determined through its Extreme Event assessments, conducted as a part of the annual transmission planning process, that there are unique characteristics of the San Francisco Peninsula area requiring consideration for mitigation as follows.
 - high density urban load area,
 - geographic and system configuration,
 - potential risks of outages including seismic, third party action and collocating facilities; and
 - challenging restoration times.



Language to be added to ISO Planning Standard (continued)

 The requirements of NERC TPL-004-0a (to be superseded by TPL-001-4) requires Extreme Event contingencies to be assessed; however the standard does not require mitigation plans to be developed for these Extreme Events. The unique characteristics of the San Francisco Peninsula form a credible basis for considering for approval corrective action plans to mitigate the risk of outages that are beyond the application of mitigation of extreme events in the reliability standards to the rest of the ISO controlled grid. The ISO will consider the overall impact of the mitigation on the identified risk and the associated benefits that the mitigation provides to the San Francisco Peninsula area.



Changes to NERC Transmission Planning Standards



Changes to remain aligned with evolving NERC TPL-001-4 Major Changes – phased in over time

Base models

- More detailed description of system conditions to model
- Modeling of known maintenance outages
- Sensitivity analysis
 - Study of sensitivity cases for varying assumptions
 - Spare equipment strategy for long lead equipment
- Annual short-circuit assessment
- New method and restrictions on limited use of load shedding
- Documentation of criteria for monitoring limits, system deviations, identification of system instability



Align Planning Standards NERC TPL-001-4

- The effective date for TPL-001-004 is spread over two years, with the effective dates of the requirements in the standard to be:
 - Requirements R1 and R7 January 1, 2015
 - Requirements R2 through R6 January 1, 2016
- Requirements R1 and R7 do not require changes to the ISO Planning Standards.
 - ISO will ensure compliance to requirements in 2014-2015 TPP
- Changes to ISO Planning Standards to align with NERC TPL-001-4 will be applicable for the 2015-2016 TPP



TPL-001-4 Table 1 - Footnote 12

- Footnote 12 applies to contingencies P1, P2-1 and P3 and states the following:
 - An objective of the planning process is to minimize the likelihood and magnitude of Non-Consequential Load Loss following planning events. In limited circumstances, Non-Consequential Load Loss may be needed throughout the planning horizon to ensure that BES performance requirements are met. However, when Non-Consequential Load Loss is utilized under footnote 12 within the Near-Term Transmission Planning Horizon to address BES performance requirements, such interruption is limited to circumstances where the Non-Consequential Load Loss meets the conditions shown in Attachment 1. In no case can the planned Non-Consequential Load Loss under footnote 12 exceed 75 MW for US registered entities.



TPL-001-4 Table 1 - Footnote 12 (continued)

- Attachment 1 indicates that Non-Consequential Load Loss is allowed as an element of a Corrective Action Plan in the Near-Term Transmission Planning Horizon and specifies specific conditions and stakeholder consultation required prior to consider acceptable.
 - Through stakeholder consultation process, such as ISO TPP, and meeting the specific conditions up to 25 MW may be considered for contingencies (P1, P2-1 and P3) on facilities less than 300 kV.
 - From 25 MW to 75 MW, ISO must ensure that the CPUC do not object to use of Non-Consequential Load Loss under footnote 12.



Contingency Event Table

New Category	Old Category	Description
P0	Cat A	System intact
P1	Cat B	Single contingency (Fault of a shunt device- fixed, switched or SVC/STATCOM is new)
P2	Cat C1, C2	Single event which may result in multiple element outage. Open line w/o fault, bus section fault, internal breaker fault
P3	Cat C3	Loss of generator unit followed by system adjustments + P1. No load shed is allowed
P4	Cat C	Fault + stuck breaker events
P5	n/a	Fault + relay failure to operate (new)
P6	Cat C3	Two overlapping singles (not generator)
P7	Cat C5, C4	Common tower outages; loss of bipolar DC



Comments on Draft Straw Proposal::

- Staged implementation, include for next planning cycle (2014-2015 TPP)
- Clarification of Footnote 12



Language to be added to ISO Planning Standard

- The Combined Line and Generator Outage Standard and the Combined Line and Generator Unit Outage Standard Supporting Information chapter will be removed.
- The links to the WECC and NERC standards as well as the ISO transmission control agreement (TCA) will be updated. A new link to the WECC Regional Business Practice TPL-001-WECC-RBP-2.1 will be provided.
- Numerous references from old NERC standards will be replaced with reference to the new NERC standard TPL-001-4 and the new nomenclature for categories of contingencies will be used.
- The following language found under <u>Planing for New Transmission</u> <u>versus Involuntary Load Interruption Standard</u> bullet 1) will be removed since it contradict new TPL-001-4 footnote 9.
 - "This includes consequential loss of load as well as load that may need to be dropped after the first contingency (during the system adjustment period) in order to protect for the next worst single contingency."



Language to be added to ISO Planning Standard

- In the Interpretations of terms from NERC Reliability Standard and WECC Regional Criteria section the following Interpretation:
 - Footnote 12 of TPL-001-4 Interpretation and Applicable Timeline⁷:
 - The shedding of Non-Consequential load following the single contingencies of P1, P2-1 and P3 on the Bulk Electric System of the ISO Controlled Grid is not considered appropriate in meeting the performance requirements. In the Near-term planning horizon the requirements of Footnote 12 may be applied until the longer-term mitigation plans are in-service. In the near-term transmission planning horizon, the non-consequential load loss will be limited to 75 MW and has to meet the conditions

⁷ TPL-001-4 has an 84 month effective date for some of the requirements. With this, after Jan 1, 2021 the Corrective Action Plans may no longer include curtailment of firm transmission service or non-consequential load loss in excess of 75 MW or non-consequential load loss that does not meet the conditions specified in Attachment 1 of TPL-001-4 for the following categories of contingencies: P1-2 and P1-3 (for controlled interruption of electric supply to local networks customers connected to or supplied by the faulted element), P2-1, P2-2 and P2-3 (above 300 kV), P3-1 through P3-5, P4-1 through P4-5 (above 300 kV) as well as P5 (above 300 kV). specified in Attachment 1 of TPL-001-4.



Next Steps



Schedule for Revision to ISO Planning Standards

Date	Action
March 26	Post issue paper/straw proposal (Complete)
April 11	Stakeholder meeting (in person) (Complete)
April 25	Stakeholder comments due by 5:00 p.m. (Complete)
May 28	Post revised straw proposal (Complete)
June 4	Stakeholder web conference
June 18	Stakeholder comments due by 5:00 p.m.
July 16	Post Draft Final Proposal
July 30	Stakeholder web conference
August 13	Stakeholder comments due by 5:00 p.m.
September 18-19	ISO Board meeting



Stakeholder Comments on Revised Straw Proposal

 Stakeholder comments are to be submitted by June 18, 2014 to: regionaltransmission@caiso.com

