COMMENTS OF THE STAFF OF THE CALIFORNIA PUBLIC UTILITIES COMMISSION

ON TRANSMISSION PLANNING STANDARDS REVISIONS

Following the April 4, 2014 Straw Proposal and April 11, 2014 Stakeholder Meeting

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April 25, 2014

Introduction

The staff of the California Public Utilities Commission ("CPUC Staff") appreciates this opportunity to provide comments on the California Independent System Operator's ("CAISO") proposed revisions to Transmission Planning Standards as described in the April 4, 2014 straw proposal and in the presentation and discussion at the April 11, 2014 stakeholder meeting. Our comments cover the following four topics.

1. The CAISO should (a) clarify treatment of consequential versus non-consequential load loss, (b) use impact-relevant factors beyond overall population density for determining where load dropping may be allowable in urban areas, and (c) explain how new NERC standard TPL-001-4 will impact treatment of load dropping in CAISO planning**.**

2. The CAISO should more specifically explain why the San Francisco Peninsula requires formal designation, via Planning Standards and Board approval, as posing unique extreme event risks such that studies of potential transmission solutions are appropriate.

3. Extreme event studies should contain a transparent, complete chain of logic and data from precipitating events (e.g., seismic) to electrical contingencies to socioeconomic impacts, with consideration of mitigation measures being supported by sufficiently specific characterization of risks mitigated.

4. The CAISO should identify how the new NERC Standard TPL-001-4 would significantly impact the CAISO's reliability studies, particularly regarding ultimate identification of mitigation investments.

Comments on the above topics are included below.

1. The CAISO Should (a) Clarify Treatment of Consequential Versus Non-consequential Load Loss, (b) Use Impact-Relevant Factors Beyond Overall Population Density for Determining Where Load Dropping May be Allowable in Urban Areas, and (c) Explain How New NERC Standard TPL-001-4 Will Impact Treatment of Load Dropping in CAISO Planning.

The existing and new (TPL-001-4) NERC planning standards as well as the CAISO's present review of planning standards refer to non-consequential load loss (load dropping) and where it may be allowed. We understand (and request correction where incorrect) that consequential load loss involves loss of loads directly served by transmission elements that are removed from service due to a contingency, e.g., to isolate a fault, whereas non-consequential load loss results from subsequent additional load loss such as via manual or automatic tripping to limit potential broader harm and maintain overall system reliability. While planning standards and practices address whether and when non-consequential load loss is allowed, there may also be consequential, unavoidable load loss under outage contingencies. Therefore, the CAISO should clarify how *both* consequential and non-consequential load loss are considered, in assessing need for mitigation.

The CAISO's straw proposal for this initiative states that non-consequential load loss should not be allowed in high density urban areas, whereas for other areas this would be determined based on a variety of risk factors such as history of fires, history of lightning, common right of way or structures, restoration time, and other factors. It is unclear what granularity[1] or threshold level of population density would be applied to identify the "high density urban areas" in question. In any event, CPUC Staff believes that other important factors relevant to load loss probability and impact should also be considered before completely precluding consideration of non-consequential load dropping for an area exceeding some population density threshold. This is similar to what the CAISO has proposed for areas not categorized as high-density urban (e.g., based on frequency of fires, restoration time, etc.), although we believe that magnitude (MW) of load loss and the composition of that load (e.g., essential public services, interruption-sensitive activities) should also be included as factors. Such a risk-reflective approach would often, *but not always*, identify the highest population

[1] e.g., for census tracts or entire counties

density areas as being the least desirable for allowing non-consequential load dropping. It could also permit a more geographically granular determination.

Lastly, the CAISO should assess and clarify for stakeholders how new NERC planning standard TPL-001-4[2] would affect the CAISO's treatment of non-consequential load loss for study and planning purposes, including how it would affect the concerns and preferences expressed in the CAISO's draft proposal.

2. The CAISO Should More Specifically Explain Why the San Francisco Peninsula Requires Formal Designation, Via Planning Standards and Board Approval, as Posing Unique Extreme Event Risks Such That Studies of Potential Transmission Solutions Are Appropriate.

CAISO staff apparently will seek Board approval for identifying the San Francisco Peninsula as a unique situation requiring special focus in terms of extreme event studies. Extreme event studies are generally required under NERC and WECC planning standards but are not prescribed in detail. The CAISO gives several broad reasons why such a special focus is appropriate, including the dense urban load center, the geography and electric topology, and the large seismic risks combined with challenging restoration times. Discussion during the April 11 stakeholder meeting questioned why some other parts of the grid did not deserve similar focus.

The CAISO should more specifically explain what makes the San Francisco Peninsula uniquely at risk for large electrical and socioeconomic impacts from extreme but credible events, such that focused extreme event studies including consideration of transmission solutions are warranted. This explanation should be sufficiently specific such that interested parties could apply the criteria to other parts of the grid to come to a similar conclusion that this particular area is in fact uniquely at risk and deserving of focused study at this time.

Furthermore, the CAISO should more fully explain *what it means* for an area to have this designation as an extreme event high-risk area deserving special focus including consideration of

[2] TPL-001-4 provisions concerning allowable non-consequential load dropping would apparently go into effect in the first quarter of 2016.

potential transmission solutions. For example: what kinds of studies and scenarios should therefore be pursued and what kinds of mitigations should be considered, beyond what may be appropriate elsewhere?

3. Extreme Event Studies Should Contain a Transparent, Complete Chain of Logic and Data from Precipitating Events (e.g., Seismic) to Electrical Contingencies to Socioeconomic Impacts, with Consideration of Mitigation Measures Being Supported by Sufficiently Specific Characterization of Risks Mitigated.

For the "extreme event" portion of the present transmission planning standards review initiative, the CAISO has stated the objective as gaining Board approval (perhaps with stakeholder support) for designating the San Francisco Peninsula as representing a unique extreme event situation deserving special focus. While comments were not requested regarding the actual study methodology, the CASIO stated at the April 11 meeting that stakeholders may comment on the study methodology. CPUC Staff thus offers high level comments regarding the study methodology.

We recognize that the extreme event situation for the San Francisco Peninsula is very challenging for assessment and for justifying mitigation investments. Dense loads and constrained electric supply circumstances are compounded by a wide range of potential seismic events having varied potential impacts, with imprecise probabilities and locations. The CAISO pointed to the New York City area as being perhaps the only comparable extreme event electric planning challenge in the country. The New York State Reliability Council Reliability Rules[3] identify a variety of extreme contingencies to be considered, similar to what has been identified by the CAISO for the San Francisco Peninsula. However, it appears that the situation in California may be even more analytically challenging. The New York standards identify two types of underlying extreme events for focus: extreme weather events and natural gas supply interruptions. For the San Francisco Peninsula the main extreme event driver of concern is

[3] http://www.nysrc.org/pdf/Reliability%20Rules%20Manuals/RR%20Manual%20V32%20Final%201-11-13%20.pdf

seismic risk, which in terms of both severity and point(s) of maximum impact may be more uncertain and wider ranging than the extreme event drivers receiving attention in New York.

For us to grasp this seismic extreme event risk and to consider possible responses, it is essential that the CAISO's study methodology produce a complete, transparent chain of logic and data (with references and assumptions) from seismic risk to electric contingencies to socioeconomic impacts. We understand that this chain will contain considerable uncertainties. However, the chain and the uncertainties need to be transparent and explicit so that stakeholders and decision makers can understand the origin of socioeconomic consequences whose avoidance or reduction might justify substantial investments or environmental impacts associated with mitigation. Also, a complete and transparent chain of logic and data should make it possible to understand and discuss which factors and uncertainties are the most important drivers of "results", i.e., drivers of estimated socioeconomic impacts, their probabilities and their need for mitigation.

In addition, if major risk mitigation projects are to be considered for approval, the extreme event studies must produce impacts and probabilities that are sufficiently *specific*. That is, while study results will likely contain ranges and uncertainties, and also some relative comparisons (probability or impact B is relatively greater than probability or impact A, where A is better understood), there must ultimately be some absolute anchor or point of reference, for understanding *how* likely and *how* large are the impacts for which we may be considering mitigation involving considerable costs and environmental impacts.

Furthermore, the assessment framework should provide a clear, consistent (with the rest of the study) estimate of how much potential damage a mitigation measure might *not* avoid such as due to being itself potentially affected by the underlying physical event, or due to other components of the system (e.g., loads, distribution) being so damaged that the mitigation cannot become fully effective for a considerable period of time.

Lastly, besides characterizing extreme event risk and efficacy of mitigation measures, the assessment should provide meaningful insight regarding what portion of the overall range of credible extreme events of this type would *not* be protected against, e.g., other Bay Area seismic

events having different physical locations or impacts. Are we reasonably confident that we are pursuing the largest and/or most effectively mitigated extreme event risks?

4. The CAISO Should Identify How the New NERC Standard TPL-001-4 Would Significantly Impact the CAISO's Reliability Studies, Particularly Regarding Ultimate Identification of Mitigation Investments.

Implementing TPL-001-4 is necessary, not optional. However, implications for CAISO's planning studies and identification of infrastructure needs are unclear. While the new standard appears to require greater conservatism in some respects, it may have a significant impact on practices for some transmission planning areas but not necessarily for the CAISO area. As part of the present transmission planning standards review initiative, the CAISO should clarify which aspects of TPL-001-4 have the greatest potential (or uncertainty) regarding impact on the CAISO's future identification of infrastructure (or operational) needs, and what that impact is. This includes impact on load dropping issues already raised under our topic 1 above.

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