



NPRR1191 Large Load SSO – ERCOT Response to Comments from Oncor and AEP

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LFLTF Meeting
October 23, 2023

Oncor's Comment on Large Load SSO

I. Subsynchronous Oscillation (SSO) Requirements

In NPRR1191, ERCOT proposes to establish SSO risk assessment processes for Loads, similar to the exiting Protocol requirements for assessing SSO risks to Generation Resources. ERCOT has not articulated the basis for this requirement, nor has ERCOT explained (1) why the screening/study processes have not been required until now, (2) whether it intends to impose the processes on all existing Loads, and (3) what the incremental SSO risk a new Load poses to itself or to other Generation Resources and Loads on the system. Rather, ERCOT simply forklifted its existing SSO risk assessment processes from Generation Resources to new Loads.

Oncor requests that ERCOT provide examples of actual Subsynchronous Control Interactions (SSCI) that are known to have occurred with Loads on the ERCOT or other electric grids. If compelling examples do not exist, Oncor recommends eliminating the portions of this NPRR that establish SSO provisions for interconnecting Loads and for evaluating SSO risk to Large Loads as part of Regional Planning Group (RPG) project independent reviews. These requirements for evaluation, and potentially mitigation, create uncertainty for interconnecting customers and should not be adopted without

strong, independently verifiable evidence of an actual risk to the new Load and/or to existing Loads and Generation Resources.

AEP's Comment on Large Load SSO

AEP agrees with Oncor that ERCOT has not yet demonstrated a need for the Subsynchronous Control Interactions (SSCI) provisions in this NPRR. Specifically, unless ERCOT provides compelling examples of actual SSCI, AEP agrees with Oncor's recommendation to eliminate the portions of the NPRR that establish SSO provisions for interconnecting Loads and for evaluating SSO risk to Large Loads as part of Regional Planning Group (RPG) project independent review. Further, AEP questions the value of Load SSO studies if the TSP cannot obtain non-generic PSCAD models to run the studies.

ERCOT Response: Collaboration Efforts and Outcome in 2022

- ❑ With known concerns with subsynchronous control interaction (SSCI) and experience with inverter-based resources, ERCOT has been actively engaged with the industry and consultants to understand the potential for SSCI between Large Load and existing series capacitors
- ❑ ERCOT hosted a sequence of meetings and a workshop to facilitate technical discussions (e.g., reliability risks) with the TSPs and consultants, involving an industry subject matter expert. As a result, the SSO process was adopted in late September 2022 at the LFLTF
- ❑ Following discussions and comprehensive reviews of the draft languages, Dynamic Working Group (DWG) TSPs successfully reached a consensus on the Large Load SSO language within the current NPRR1191 in December 2022

ERCOT Response: Potential Reliability Risks Discussed During the Collaboration

- ❑ SSO review process is crucial for Large Loads connected to 345 kV transmission facilities near series capacitors
- ❑ Large Loads with motors or power electronics could be vulnerable to induction generation effect or SSCI, similar to wind or solar inverters
- ❑ Large Load Interconnections near series capacitors could cause operational complications such as:
 - Negative electrical damping at subsynchronous frequencies
 - Large load loss and system balancing issues
 - Transformer excitation and voltage distortion
 - Induction generation effect and subsynchronous control interaction (SSCI)
- ❑ No actual incidents of load and series capacitor interaction are available in ERCOT. That is because the load has traditionally been connected to the low voltage transmission, located far away from series capacitors
- ❑ Accurate model representing the load characteristics is necessary for appropriate SSO study

Recommendation and Next Steps

- ❑ Based on the reasons, ERCOT recommends approval of the Large Load SSO languages in the NPRR1191 in its original form as submitted by ERCOT
- ❑ Working proactively to address potential SSO vulnerability associated with Large Load is an appropriate step

Questions?



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