



Stability Limits Update

Markets Implementation Committee
May 13, 2020

- At April MIC, PJM presented a potential approach to model stability limits
 - Model as “generator output constraint” for Stability restricted units
- After PJM further review, stakeholder feedback, and collaboration, PJM can still jointly sponsor the existing package with IMM but can also support the status quo
 - Package does not fully resolve gaps such as reflecting action in LMPs
 - Current rules provide flexibility
- PJM will review existing transparency, modeling, and communication under the existing construct
- Stakeholders may propose additional packages
 - If no additional packages offered then PJM can support status quo

Planning

Markets/Operations Method 1: Unit Reduction

Markets/Operations Method 2: Thermal Surrogate

Modeling	Stability studies which also include N-1-1 scenarios listed in Manual 3 operating guides and per TO criteria are considered	Reduce Emergency and Economic Max to stability limit	Engineers develop a MP1 'thermal surrogate' consisting of a transmission element or elements
Transparency	Manual 14B	Manual 3: Section 3.9.1	Manual 3: Section 3.9.1
Compliance and Notification	<ul style="list-style-type: none"> Comply with applicable NERC standards (e.g., TPL-001-4) and TO stability criteria (FERC 715 Filing) Interconnection customers are required to reinforce the system if curtailment is not an option 	<ul style="list-style-type: none"> Maintenance Ticket needs to be submitted in eDART and eGADS Market Seller notified 	<ul style="list-style-type: none"> MP1 thermal surrogate developed Market Seller notified
Compensation	<ul style="list-style-type: none"> Least cost remedy to N-1-1 outage violations for new generators under study is to allow them to curtail during the event 	<ul style="list-style-type: none"> Unit receives LMP for MWs <ul style="list-style-type: none"> Higher LMP w/o thermal surrogate No LOC 	<ul style="list-style-type: none"> Unit receives LMP for MWs <ul style="list-style-type: none"> Lower LMP with thermal surrogate LOC paid if dispatch and price do not line up and unit following dispatch

3.9.1 Process for Handling Generator Stability Limitations

- The Reliability Limited Generation Compensation Task Force established the following procedure on how PJM currently handles Stability Issues on the transmission system. When a stability issue is identified and advanced coordination is not possible, PJM will:
 - Confirm/calculate the stability limit and communicate the limit to the generator(s) as quickly as possible and prior to DA market submission when practical.
 - Create an interface that would be used in the Day Ahead and Real Time Market so that LMP will be utilized to reflect the stability constraints.
 - If the generator chooses to reduce their Economic Maximum bid below the stability limit, the constraint would not bind.
 - If the constraint does bind, it would be handled consistent with how PJM handles other transmission constraints on the system. All current market rules regarding Lost Opportunity Cost (LOC) would apply and LOC would be paid as currently defined in the Tariff when a transmission constraint is in effect. For previously identified stability constraints already documented in Manual 03 Section 5, the generation owner may have already agreed to limit its output to ensure the stability constraint is mitigated. In such cases, an interface constraint in the Day Ahead and Real Time markets is not necessary

Key Takeaway:
Process already exists and developed through previous stakeholder group

- Solicit additional packages

- PJM review existing construct to determine if enhancements can be made in the following areas:
 - Transparency
 - Modeling
 - Communications