



New ERCOT SOL Methodology - IROL Assessment

ROS Meeting
Sept. 03, 2020

ERCOT Transmission Operations Planning

NERC Guideline and ERCOT Methodology

- Reliability Guideline – Methods for Establishing IROLs (Sep. 2018)
 - IROL: A System Operating Limit that, if exceeded, could lead to System Instability, Uncontrolled Separation, or Cascading that adversely impact the reliability of the Bulk Electric System.
- ERCOT System Operating Limit Methodology for Planning and Operations Horizon (Oct. 2020)
 - IROL Determination Criteria
 - An SOL is an IROL if studies performed in the planning or operations horizon indicate that the system performance response resulting from exceedance of the SOL would result in:
 - System Instability
 - Loss of load in the Cascading or voltage collapse, either through manual action or as a consequence of the event, including loss of load as a result of Under Voltage Load Shedding (UVLS) and Under Frequency Load Shed (UFLS), greater than a threshold as defined in Section 3.8 of this methodology;
 - IROL Load Loss Threshold Guideline
 - In the Planning horizon and Operations Planning horizon, if studies show that an SOL exceedance would result in a loss of load greater than 2000 MW as a result of instability, cascading or uncontrolled separation, that SOL is an IROL. These studies must adequately quantify the load that would be lost by exceeding the SOL during potential operating conditions for the duration of the validity of the determination, in order to make this determination

IROL Assessment for Transient Stability

Transient Stability Assessment

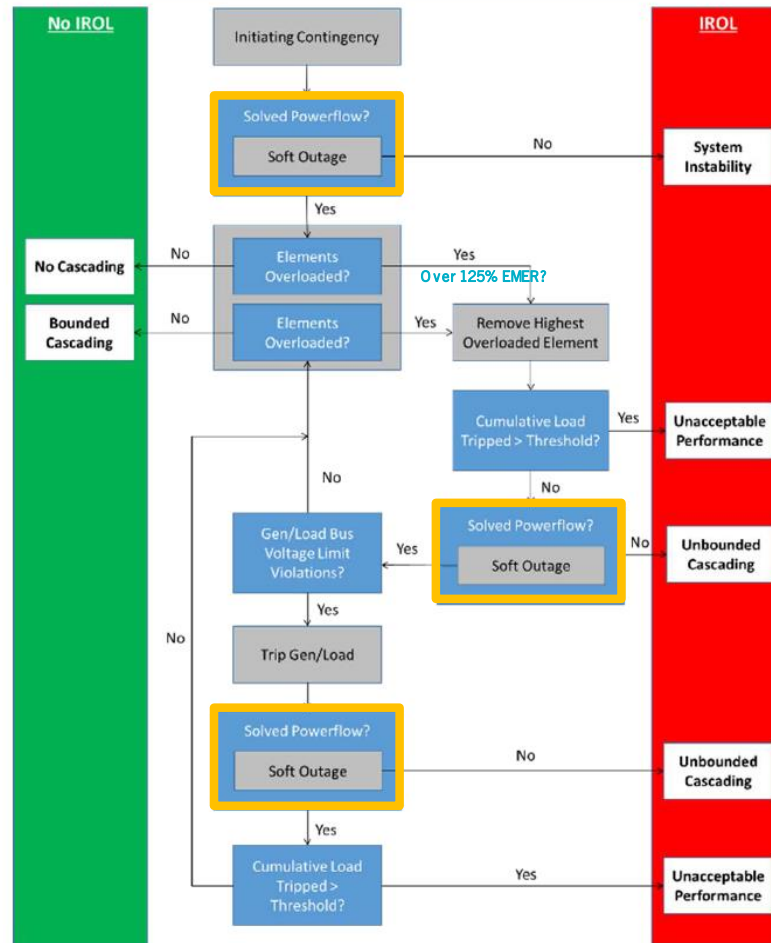
- Dynamic simulation for the critical events from the QSA/GTC study under the unstable transfer level (GTLs exceeded)
- Identify the instability issue (rotor angle, voltage, frequency, small signal)
- Check if the instability issue can be contained.
 - If not, it is an IROL
 - If so, check loss of load and gen



Steady State Analysis (Optional)

- When dynamic simulation results indicate power imbalance but not an IROL, run steady state cascading analysis by repeating:
 - Re-dispatch
 - Trip the transmission element with the maximum over-load if the over-load is higher than 125% of Rate B or 100% of RLR
 - Re-run power flow

IROL Assessment for Voltage Stability (PV)



UVLS is applied after each Powerflow (Soft Outage)

Source: MEITF https://www.nerc.com/comm/PC/Methods%20for%20Establishing%20IROLs%20MEITF%20Webinars/2019_01_MEITF_Webinar.pdf



IROL Assessment Summary

- ERCOT evaluated 12 GTCs that are constrained by transient stability and PV voltage stability
- Based on the new SOL methodology, ERCOT has determined that 5 of those 12 GTCs will be classified as IROL
- IROL assessments will be conducted as part of all future GTC studies/updates

Questions?