Attachment Y Review
Teche Unit 3

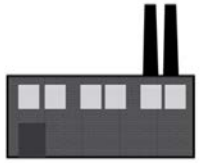
South Technical Study Task Force
Attachment Y Study with Reliability Issues

February 21, 2017
Public

Overview

- **Purpose**
  - Review reliability issues identified in the Attachment Y study for the Retirement of Teche Unit 3
  - Review of SSR alternatives evaluation
- **Key takeaways**
  - Teche Unit 3 retirement results in severe thermal violations that pose a risk of cascading outages and cannot be mitigated by allowable system adjustments.
  - Teche Unit 3 will need to be designated as an SSR unless feasible alternatives are identified and can be implemented prior to the planned retirement date
    - Planned transmission upgrades will eliminate the SSR need but cannot be completed prior to the planned retirement date

MISO's SSR Process* for Reliability Purposes



Plant owner submits Attachment Y notice 26 weeks prior to change of status††††

Feasible alternative identified†††

No reliability Issues†

Reliability Issues††

Unit Approved to Retire or Suspend

MISO Evaluates Reliability Impact

Alternatives Discussed

Plant Designated As SSR

Agreement Reached and Filed at FERC

Annual Review

† Attachment Y Notice kept Confidential until the Retirement date

†† Units eligible for SSR status are posted on MISO OASIS

†††Feasible alternatives are those that mitigate the reliability issues and can be implemented prior to unit's change of status.

††††Special Cases (e.g. Forced Outage or pseudo-tied out gen.) – 30 days notification and no SSR designation.

*Governed by MISO Tariff – Module C Section 38.2.7

Background

Teche Unit 3

- Cleco LLC. Louisiana
- Baldwin, LA
- 335 MW
- Gas fired
- Retirement

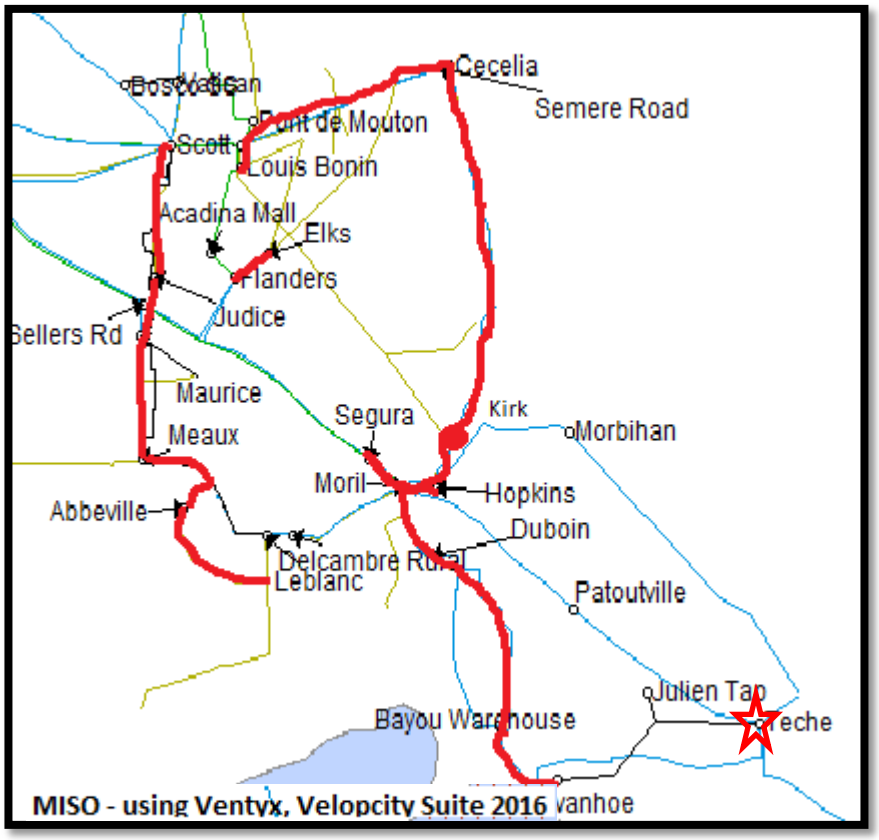
  April 1, 2017

Reliability Analysis

- Attachment Y study was performed to assess near term and longer term impacts
  - 2017 Summer Peak
  - 2017 Shoulder
  - 2021 Summer Peak
- Most of the issues are mitigated by allowable system adjustments as per the NERC TPL 001-4 standard and local transmission owner planning criteria
- Analysis Identified four (4) unresolved issues caused by three (3) NERC Category P6 contingencies

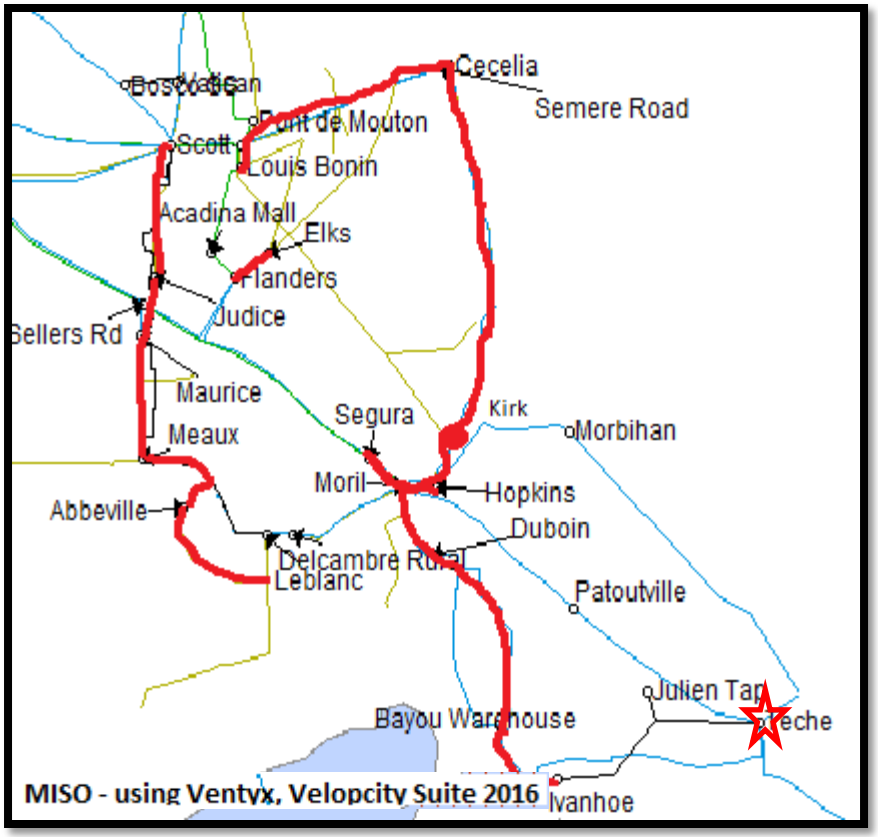
Reliability Issues Identified – 2017SP

- Thermal violations - 16 facility overloads were caused by numerous NERC Category P6 events.
  - Most overloads are addressed by system adjustments allowed by NERC planning standards
  - Severe overloads(>130%) caused by 3 contingent events that would result in cascading outages due to subsequent overloads and lead to voltage instability or collapse.
  - These severe overloads can be mitigated by dispatch of Teche Unit 3



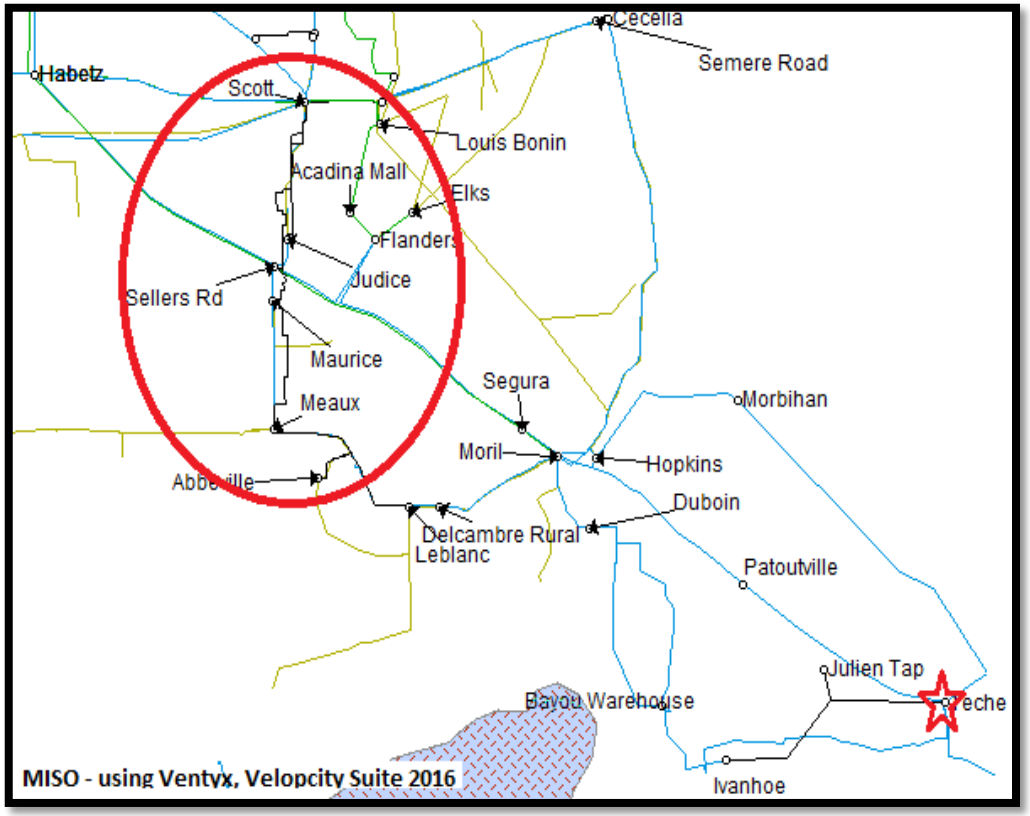
Reliability Issues Identified – 2017SP (Cont.)

- Thermal violations - 3 NERC Category P4 contingencies caused overloads on 4 facilities
  - Overloading can be addressed by allowable operational mitigation until upgrades are completed



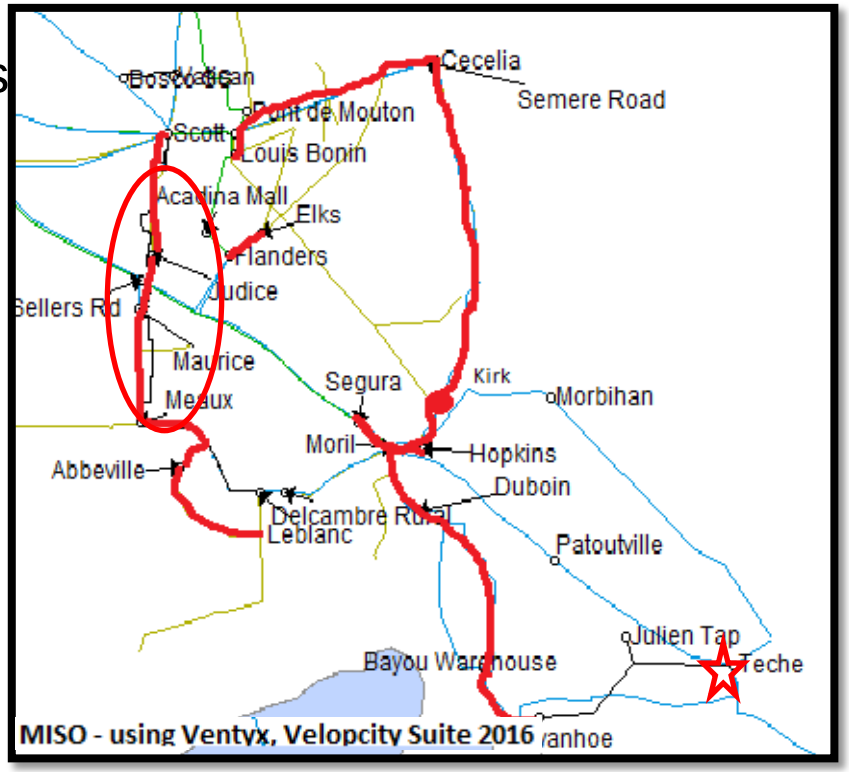
Reliability Issues Identified – 2017SP (Cont.)

- Voltage violations
  - 2 NERC Category P6 Contingencies degraded voltages on 6 buses
    - Degraded voltages in the area can be mitigated by allowable system adjustments.



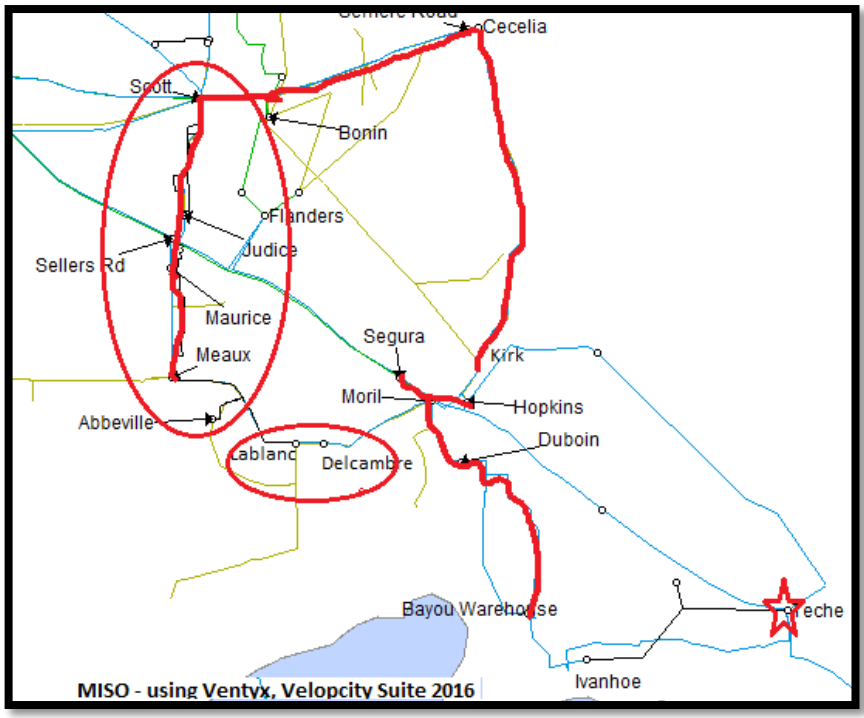
Reliability Issues Identified – 2017SH

- Thermal violations
  - 18 NERC Category P6 contingencies caused overloads on 12 facilities
    - All overloads can be addressed by allowable system adjustments
  - 3 NERC Category P4 contingencies caused overloads on 7 facilities
    - Overloading can be addressed by operational mitigation until upgrades are completed
- Voltage violations
  - 2 NERC P6 Contingencies degraded voltages on 5 buses
    - Degraded voltages can be mitigated by allowable system adjustments



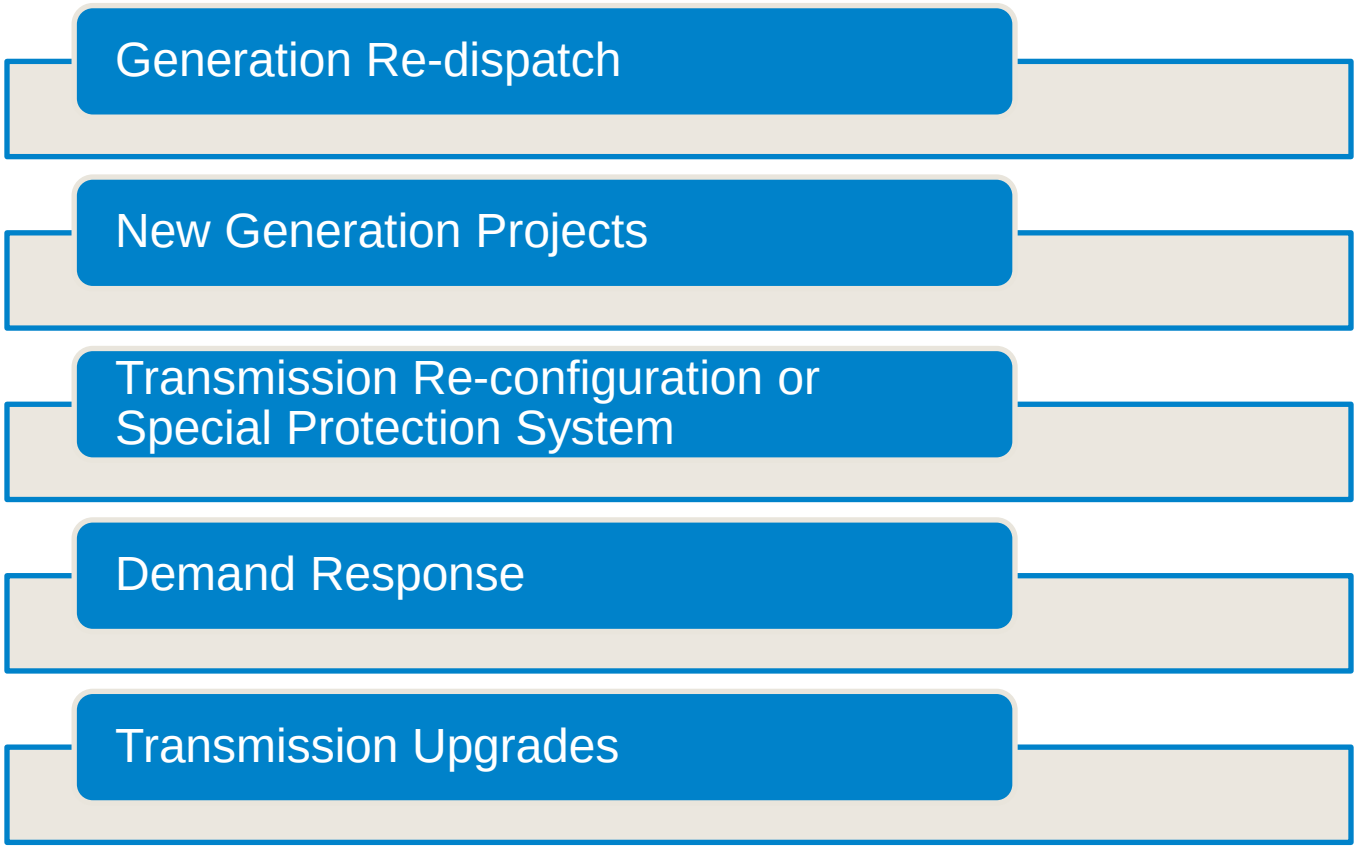
Reliability Issues Identified – 2021SP

- Thermal violations
  - 24 NERC Category P6 contingencies caused overloads on 11 facilities
    - All overloads can be addressed by allowable system adjustments
  - 2 NERC Category P4 contingencies caused overloads on 1 facility
    - Overloading can be mitigated by operational mitigation until upgrades are completed
- Voltage violations
  - 2 NERC Category P6 Contingencies degraded voltages on 9 buses
    - Degraded voltages can be mitigated by allowable system adjustments



SSR Alternatives

- Permanent system reinforcements intended to allow generator to ultimately suspend or retire



Reconfiguration/Operating Guide Alternative

- Reconfiguration options (e.g. switching, load shifts) were investigated, and determined to be not adequately addressing excessive overloads caused by 3 NERC Category P6 contingencies

- No existing operating guide that can address severe overloads identified in the study

- An operating guide is being developed to commit Teche 3 based on the load levels in the area due to its longer notification time.

Demand Response Alternative

- Analysis was performed to inform stake holders about the amount of contracted demand response required to avoid need for SSR

- Estimate of the minimum amount of hypothetical load curtailment needed to relieve unresolved constraints
  - Determined by using load bus sensitivities to the constrained element
  - Apply incremental load shed at buses with highest distribution factors until overload is mitigated
  - Amount of demand response to address the worst constraint was estimated to be **134 MW**
  - Assumes contracted demand response customers will be located at the buses identified in the analysis (more may be required if location is different)

Planned/Proposed Transmission Solutions

- Terrebonne- Bayou Vista 230 kV transmission line (MTEP ID: 7988; ISD: 06/01/2018) – Reduces loading to below 130% which can further be mitigated by allowable system adjustments and will permit SSR termination

- Cleco Hopkins station breaker addition (MTEP ID: 10983; ISD: 05/01/2017) – addresses violations caused by Category P4 contingencies

- Cleco Segura station bus re-configuration (Project to be submitted) – addresses violations caused by Category P4 contingencies

Conclusion

- Most of the identified violations caused by NERC Category P6 contingency events were adequately addressed by allowable system adjustments that were evaluated, including generation re-dispatch and post-contingent load shed.
- The excessive overloads caused by 3 NERC Category P6 contingency events, that result in cascading outages and instability, cannot be mitigated by any system adjustments permissible by the planning criteria.
- No feasible alternative has been found that can be implemented prior to the retirement date of April 1, 2017
- **Teche 3 is required to remain available as a System Support Resource Unit.**

Contact Information

- **Kunjal Yagnik**
  504-846-7117
  kyagnik@misoenergy.org

- **Neil Shah**
  317-249-5633
  nshah@misoenergy.org