Sub-Zonal Tie Update and Loss Calculation Process

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Presentation Overview

- Power System Network Model – Overview
- Sub-zonal Tie Update / Validation Process
- Sub-Zone Loss Calculations

Power System Network Model

- Prior to the implementation of SMD-2 (February 1, 2005), different formats of power system models were being used for Energy Management Systems & ISO Energy Market Systems.
- Since the implementation of SMD-2, a single source is used by all applications that require a power system network model such as Energy Management System (EMS), Security Constrained Unit Commitment (SCUC) and Real-Time Commitment/Dispatch (RTC/RTD), as well as the Transmission Congestion Contracts (TCC) market.
- This single model data source facilitates maintenance of the consistency of the different markets that require a power system models.

Power System Network Model Update

- The power system network model is being maintained and updated through ABB's Common Information Model (CIM) Data Engineering Toolkit.
  - *Oracle based program*
  - *Graphical editing environment*
  - *Versioned editing*
  - *Supports SCADA data definitions*
  - *Supports PI historian definitions*

Sub-zone Tie Definition Update

- One of the key factors that determines how ISO transmission losses are being defined and calculated is maintained in the CIM database.
- The current sub-zonal tie definitions are defined in CIM.
- In addition to network impedances, the CIM database contains the following information related to the sub-zonal loss determinations.
  - *Subzone tie lines definitions*
  - *Subzone area definitions*
  - *Meter location of the subzone ties*
  - *Metering authority*
  - *Tie line name & associated PTID number*

The Process of Updating a New Tie Line

- The NYISO Control Center Requirement Manual, with further detail identified in ISO Technical Bulletin #160, requires New York Transmission Owners to supply the NYISO with updated network modeling data and associated real-time measurement data for its EMS and SCUC/RTC/RTS applications.
- The Transmission Owners would inform the NYISO of such a network model update and associated real-time measurement data including the update of the sub-zone tie lines and implementation dates.
- The NYISO would review and update the power system network model in CIM including all required attributes of the sub-zonal tie.

The Process of Updating a New Tie Line (cont.)

- Coordination across the ISO includes:
  - *Market Operations*
  - *IT - Configuration Management*
  - *IT – Software Development*
  - *IT - Quality Assurance*
  - *Customer Settlements*
  - *Customer Support & Training*
- Test plans for different applications
  - *EMS applications*
  - *SCUC/RTC/RTD applications*
  - *QA systems*

Subzone Tie Line Update Data Validation

- Validate EMS applications
  - *SCADA data - all newly defined measurements.*
  - *AGC - Automatic Generation Control.*
  - *SE - State Estimator*
  - *DLF - Dispatcher Load Flow*
  - *CA - Contingency analysis*
  - *CIM and Station one-line diagrams.*
- Validate BMS applications
  - *RTC/RTD - Real-Time Scheduling Systems.*
  - *SCUC – Security Constrained Unit Commitment.*
  - *All zonal ties and zonal generators for load forecast applications*
- Validate all new PI tags

Subzone Tie Line Update Data Validation (cont.)

- The new database is moved to QA staging environment for System Integration testing (Bid-to-Bill).
- All affected departments are informed with the details of the changes to the network model, a week prior to the deployment scheduled date.
- All subzone tie line updates have to be completed and submitted to management for approval review.
- A “Procedure to Deploy New/Modified Tie Line for Staging/Production” is followed.

New Sub-zonal Tie Added Recently

- A new 115 KV sub-zonal tie: GENMOTOR-AKWESSNE 21.
- NY Transmission Owners involved: National Grid & New York Power Authority
- Subzones Impacted: NM North subzone & PA North subzone

Zonal Losses Methodology - Certification

- In April 2006, the NYISO retained the PA Consulting Group to perform a review of the NYISO's Day Ahead and Real-Time Markets.

- The objective of PA Consulting's work was to confirm that the NYISO's software (SCUC & RTC/RTD) calculated prices in compliance with the NYISO's Tariffs, manual, and procedures.

- As part of this effort, PA Consulting certified that transmission losses were calculated in accordance with the NYISO's Tariffs, manuals, and procedures.

Sub-zone Loss Calculations

- The NYISO determines transmission losses for that portion of the NYS power system that is modeled in CIM, specifically power system facilities operating at 69kV and higher transmission voltages.
- Sub-zonal ties operating at less than 69kV are not defined in CIM because they are not expected to contribute to ISO transmission losses and, as a result, are not modeled.
- Distribution losses associated with sub-zonal ties and other power system facilities operating at less than 69kV are addressed by NY Transmission Owners through the use of distribution gross up factors that are filed with the NYPSC.
- All sub-zonal ties, including those operating at less than 69kV, are represented in the Billing and Settlement Systems for energy accounting (M-Load) purposes.

The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

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