Interchange Subcommittee Actions on Dynamic Transfers

Background

The Interchange Subcommittee (IS) is responsible for NERC Policy 3, "Interchange" as well as administering the E-Tag system and specification. Policy 3 requires that scheduled interchange, with few exceptions, is tagged prior to schedule implementation and provided to the Interchange Distribution Calculator (IDC) through the E-Tag systems.

Dynamic transfer is the provision of the real-time monitoring, telemetering, computer software, hardware, communications, engineering, energy accounting (including inadvertent interchange), and administration required to implement a dynamic schedule or pseudo-tie. Though dynamic transfers have been implemented between Control Areas for years, implementation guidelines and requirements are needed as the industry has various interpretations on how to implement, operate, and account for dynamic transfers. Setting guidelines and requirements for dynamic transfers would reinforce the coordination of information necessary to ensure that the operation to and accounting of dynamic schedules and pseudo-ties is consistent between all parties to the dynamic transfer.

Dynamic transfers implemented as pseudo-ties do not require tagging because the implementation should be captured in the base system model. Pseudo-ties are accounted for in a control areas' Net *Actual* Interchange similar to interconnection ties. Dynamic transfers implemented as dynamic schedules are required to be tagged for the projected interchange and provided to the Interchange Distribution Calculator (IDC). Dynamic schedules are accounted for in a control areas' Net *Scheduled* Interchange.

Scheduled interchange that is not properly tagged will not be entered into the IDC. This can result in TLR curtailments that do not effectively relieve the congested flowgate, or curtailments that do not align with the transmission service priorities specified in the *pro forma* tariff, or both. The Interchange Subcommittee plans a number of actions, both long-term and short-term, to address the dynamic transfer issues.

AIE – E-Tag Audit

The NERC compliance group conducted the first ever E-Tag audit in conjunction with an AIE audit called by the Resources Subcommittee. The audit was for the seven hours prior to and including the August 14, 2003 blackout. The AIE – E-Tag audit compared the net E-Tag schedules as provided to the IDC, to the Net Scheduled Interchange from the AIE surveys as accounted for by the control areas. Although the audits did not compare exact sets of data, it was assumed that the difference between the two data sets would be minimal.

The audits revealed significant differences over 1,000 MWs for a few control areas and raised concerns that some dynamic schedules were not tagged or revised properly. Based on these results, NERC compliance issued a follow-up audit where control areas were asked to reconcile the differences between the two sets of data and to categorize their untagged schedules. This audit's results do not definitively identify Policy 3 violations. The Interchange Subcommittee plans to further analyze the responses from the control areas that averaged over 100 MWs of difference over the seven audit hours.

System Modeling and Simulation Analysis Team

Bob Cummings, NERC's director of reliability assessments and support services, is involved with the outage investigation and facilitates the Modeling and System Studies Team (M&SST). This team is modeling and conducting transmission studies in the outage areas. The M&SST has encountered a number of problems while doing these studies such as accounting for dynamic transfers and jointly owned units, and how untagged interchange may cause problems for real-time security analysis. The M&SST notes:

Analysis conducted of the Eastern Interconnection tags for August 14 highlighted an ongoing discrepancy between the total interchange transactions between control areas and the electronic tags. A tag audit was conducted by NERC in conjunction with an Area Interchange Error (AIE) survey for a number of hours on August 14. That tag audit showed large discrepancies caused mostly by capacity transactions related to jointly owned generating units and remotely metered control area loads. For 15:00 EDT, the discrepancy for FirstEnergy imports was over 2,400 MW of untagged transactions for their shares of Beaver Valley nuclear plant and Seneca pumped storage plant. Such large discrepancies create errors in system security analyses of other system operators' state estimators, and errors in the IDC solutions for TLR.

The M&SST made the following recommendation:

The regulations for tagging of dynamic schedules and pseudo-ties should be strengthened and monitored for compliance.

NERC Outage Recommendation

The M&SST recommendation was rolled into the **NERC Recommendations to Prevent and Mitigate the Impacts of Future Cascading Blackouts, Recommendation 14: Improve System Modeling Data and Data Exchange Practices.**

The after-the-fact models developed to simulate August 14 conditions and events indicate that dynamic modeling assumptions, including generator and load power factors, used in planning and operating models were inaccurate. Of particular note, the assumptions of load power factor were overly optimistic (loads were absorbing much more reactive power than pre-August 14 models indicated). Another suspected problem is modeling of shunt capacitors under depressed voltage conditions. Regional reliability councils should establish regional power system models that enable the sharing of consistent, validated data among entities in the region. Power flow and transient stability simulations should be periodically compared (benchmarked) with actual system events to validate model data. Viable load (including load power factor) and generator testing programs are necessary to improve agreement between power flows and dynamic simulations and the actual system performance.

Interchange Subcommittee plans to address Dynamic Transfers

Interchange Subcommittee Review of the AIE – E-Tag Audit

After reviewing the August 14, 2003, AIE – E-Tag audit results, the Interchange Subcommittee identified some of the same inconsistencies between the AIE Net Scheduled Interchange and the E-Tag schedules as those noted in the audit responses. For example, one control area noted that over 800 MWh of load, served by other control areas within its transmission system, is tagged as if the scheduled interchange is sinking in that control area. Therefore, the IDC is provided accurate information on the physical flow of the 800 MWh. The scheduled interchange reflected back to the responsible control areas in the AIE reporting created some discrepancies between the E-Tag and the AIE Net Scheduled Interchange. The Interchange Subcommittee will continue to investigate the various accounting methods to provide an accurate measurement of compliance to Policy 3 for coordinated interchange scheduling, including the provision of accurate scheduling information to the IDC.

Although the AIE – E-Tag comparison was not an "apples-to-apples" comparison of scheduled interchange, the comparison still uncovered some discrepancies. Though required in Policy 3, the audit

results indicate that some dynamic schedules were not properly tagged and subsequently were not reflected in the IDC. In addition, the AIE – E-Tag results and control areas responses indicate that the projected interchange reflected in the E-Tag for some dynamic schedules, was not updated when the dynamic schedule exceeded the 25% boundary set by Policy 3. Policy 3 requires the Purchasing-Selling-Entity (PSE) update the E-Tag when the dynamic schedule varies by 25% or more, when compared against the projected interchange in the E-Tag. These discrepancies and those identified by the M&SST reinforce the need to move forward with the Interchange Subcommittee's recommendations to address the implementation of dynamic transfers.

The Interchange Subcommittee will continue to review the audit responses and request additional explanations from those control areas whose responses have not clearly demonstrated non-compliance to Policy 3 requirements. If the Interchange Subcommittee determines that any party violated Policy 3, data supporting the subcommittee's determination will be provided to NERC's compliance group for further action.

Dynamic Transfer White Paper

A subgroup of the Interchange Subcommittee (Dynamic Transfer Task Group) has drafted a Dynamic Transfer White Paper that provides guidance for the implementation of dynamic transfers. The Interchange Subcommittee plans to submit the white paper to the Operating Committee for approval as a reference document at its March 2004 meeting. The white paper will provide guidance for future implementations of dynamic transfers, and may be used by the Interchange Subcommittee as background to draft policy revisions, develop an associated appendix, draft a SAR on dynamic transfer, or draft compliance templates.

Letter to the Industry on Policy 3 and Dynamic Transfers

The Interchange Subcommittee periodically surveys the industry on possible enhancements to the E-Tag system. One recent survey question dealt with the addition of a "checkout" function to E-Tag also asked, "Do you have any untagged interchange?" "If so, what schedules are untagged?" A number of responses seemed to directly violate Policy 3. The Interchange Subcommittee will write a letter to the industry stating the tagging requirements in Policy 3. The letter will also be used to prepare the industry for the upcoming Dynamic Transfer Catalog Survey.

Dynamic Transfer Review Process and Catalog

The Interchange Subcommittee intends to conduct an industry survey to identify the current control area configurations for dynamic transfers implemented to accommodate jointly owned units, remote loads, remote generation, supplemental regulation service, and AGC interchange, among other uses. The control areas will be required to provide detailed operating and accounting methods for each dynamic transfer along with the 'associated' control area(s) involved in the dynamic transfer. The Interchange Subcommittee will review the data to ensure among other items that:

- Entities are accounting for transfers of the same MW in the same way
- Transfers are handled correctly in the ACE equations
- Transfers that should be tagged are tagged.

Upon NERC Operating Committee approval of the Dynamic Transfer White Paper as a reference document, the Interchange Subcommittee intends to propose a review process for the implementation of new dynamic transfers. The Interchange Subcommittee would also propose that a task force or working

group be established, with members from the IS, DFWG, IDCWG, RS, RCWG, ORS, RS, and NAESB, to oversee the review process. The intent is not to create a bottleneck for implementing dynamic transfers, but to provide a review to ensure that all parties to the dynamic transfer are following the requirements stated in Policy 3 and other NERC policies.

Comparing EMS, E-Tag and AIE Data

In the Interchange Subcommittee's discussion of the current AIE – E-Tag audit process, the subcommittee evaluated how future audits may be structured to ensure that all interchange is accounted for correctly, how the submitted audit data could be quickly analyzed, and what data is needed for the subcommittee to determine if violations to Policy 3 had occurred.

The Interchange Subcommittee will continue to discuss revisions to the audit process to address:

- Discrepancies between Net Scheduled Interchange as implemented in the Energy Management System (EMS) and E-Tag data provided to the IDC.
- Discrepancies between Net Scheduled Interchange as implemented in the EMS and Net Scheduled Interchange as accounted for in the AIE.
- Proper operation and accounting of pseudo-ties by all parties.
- Proper operation and accounting of dynamic schedules by all parties.
- Scheduled Interchange required to be provided to the IDC

The subcommittee is considering an audit that would require the submittal and analysis of AIE, E-Tag, **and EMS data**.

Policy 3 Revisions and Compliance Templates

Based upon the lessons learned from the dynamic transfer review process and catalog, the Interchange Subcommittee intends to add requirements to Policy 3 to address dynamic transfers as necessary and strengthen the current Tagging requirements for dynamic schedules. The subcommittee is currently drafting compliance templates, including performance measures, directed toward the implementation of schedules into the Energy Management System, proper tagging of dynamic schedules, the handling of pseudo-ties, and provisions for ensuring accurate data is provided to the IDC.