11.0: Near-Term Process

A key part of PJM market integration from a regional planning perspective includes testing each new system for compliance with applicable reliability standards to accommodate forecasted demand, committed resources and firm transmission service obligations. Compliance violations are identified and enhancement plans are developed to solve them.

American Transmission Systems, Inc. (ATSI)

Based on FirstEnergy’s integration filing submitted to FERC on August 17, 2009, ATSI transmission assets will be integrated into PJM effective June 1, 2011. ATSI, shown on Map 11.1, is a wholly owned subsidiary of FirstEnergy and owns the transmission assets of its electric utility operating companies – The Toledo Edison Company (Toledo Edison), The Cleveland Electric Illuminating Company (The Illuminating Company), Ohio Edison Company (Ohio Edison), and Pennsylvania Power Company (Penn Power). PJM has completed all required studies to incorporate ATSI into the Regional Transmission Expansion Plan (RTEP) process beginning in 2011, as discussed in Section 11.1.
**Duke Energy Ohio and Duke Energy Kentucky**


PJM began required analyses in 2010 to study Duke Energy integration. Initial deliverability studies necessary for May 2011 Reliability Pricing Model (RPM) auction input were completed in December 2010 and forwarded to Duke for review. Remaining integration studies will be completed as part of PJM’s 2011 RTEP cycle of analyses.
11.1: American Transmission Systems, Inc. (ATSI) Integration

11.1.0 – System Topology
ATSI owns Bulk Electric System (BES) transmission facilities, comprising approximately 7,100 circuit miles of transmission lines with nominal voltages of 345 kV, 138 kV and 69 kV.

Thirty-five interconnections join ATSI with six neighboring transmission owner zones via tie lines to the east with Pennsylvania Electric Company (Penelec), Duquesne Light and Allegheny Power (all current PJM Members); the north through multiple 345 kV ties with Michigan utilities (MECS), and to the south through ties with American Electric Power and Dayton Power & Light (both PJM Members). Thirty-two of these 35 tie lines join with PJM Member systems.

Currently, through its affiliation with the Midwest ISO, ATSI plans, operates and maintains its transmission system in accordance with North American Electric Reliability Corporation reliability standards, and applicable regulatory agencies to ensure reliable service to customers.

PJM initiated specific ATSI integration analyses in 2009, similar in scope to that of an annual RTEP cycle of analysis.

11.1.1 – Internal Reserve Margin (IRM) Studies
PJM IRM studies with and without ATSI revealed no change to the IRM.

PJM completed specific ATSI integration RTEP work in early 2010, incorporating ATSI into the annual RTEP analysis cycle. As part of the 2010 RTEP process, PJM has completed its load forecast, incorporating ATSI into the PJM load model. No major impacts on the load forecasting process were encountered.

11.1.2 – Deliverability Analyses
The ATSI 2013 as-planned system was tested for compliance with applicable reliability standards to accommodate forecasted demand, committed resources, and commitments for firm transmission service. RTEP upgrades were developed to solve identified reliability criteria violations.

Generator Deliverability
PJM completed a 2013 baseline generator deliverability study for all generation with ATSI executed Interconnection Agreements as of December 31, 2009.

Load Deliverability Analysis
In addition to Generator Deliverability analysis, PJM also performed Load Deliverability analysis on the ATSI system to test the capability of the ATSI transmission system to import energy during a capacity emergency. PJM developed transmission expansion upgrades to solve identified reliability thermal and voltage criteria violations.
Market Integration

11.1.3 – Criteria Violations and Upgrades

PJM studied ATSI BES facilities as part of Baseline Analysis, Generator Deliverability, Load Deliverability, n-1-1 Thermal and voltage analysis, Short Circuit analysis and Stability analysis. PJM identified 29 reliability criteria violations in ATSI requiring transmission upgrade solutions:

- Five Generator Deliverability violations
- Three Load Deliverability Voltage Violations
- One Common Mode Outage Violation
- Eighteen n-1-1 Thermal Violations
- Two n-1-1 Voltage Violations

The violations identified during this analysis were communicated to ATSI for development of transmission upgrade solutions. All violations and upgrade plans have been reviewed with PJM’s Transmission Expansion Advisory Committee (TEAC), but will not be approved by the PJM Board until ATSI is integrated with PJM. All identified upgrades are required to be in-service prior to June 1, 2015 integration.

Map 11.2 and Table 11.1 show the four upgrades of largest scope, all at 345 kV and over $5 million.

Table 11.1: Summary of ATSI Criteria Violations and Solutions

<table>
<thead>
<tr>
<th>Description</th>
<th>Criteria Violation</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build new Hayes 345/138 kV substation with new 138 kV lines to: Greenfield #1, Greenfield #2, and Avery.</td>
<td>Voltage Collapse</td>
<td>Load Deliverability Voltage</td>
</tr>
<tr>
<td>Build Beaver - Hayes - Davis - Besse #2 345 kV line</td>
<td>Voltage Collapse</td>
<td>Load Deliverability Voltage</td>
</tr>
<tr>
<td>Loop the Chamberlin - Mansfield 345 kV line into the Hanna 345 kV substation</td>
<td>Voltage Collapse</td>
<td>Load Deliverability Voltage</td>
</tr>
<tr>
<td>Install a new Fulton 345/138 kV substation</td>
<td>Overload of Fort Industries – BP Oil 138 kV line and the General Mill – Jackman 138 kV lines</td>
<td>n-1-1 Thermal</td>
</tr>
</tbody>
</table>