



# **2015 Northeastern Coordinated System Plan**

**ISO New England, New York ISO, and PJM**

**April 11, 2016**



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### Preface

The New York Independent System Operator (NYISO); PJM (i.e., the Regional Transmission Organization [RTO] for all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and the District of Columbia); and ISO New England (ISO-NE), the RTO for New England, coordinate planning under the Northeastern ISO/RTO Planning Coordination Protocol and other joint agreements. The protocol includes the following requirements:

- Exchanging data and information
- Coordinating interconnection requests and transmission requests with cross-border impacts
- Developing a Northeastern Coordinated System Plan
- Performing planning studies through an open stakeholder process
- Allocating the costs associated with projects having a cross-border impact consistent with each party's tariff and applicable federal regulatory policy

The ISO/RTOs implement the protocol consistent with interregional planning requirements of the Federal Energy Regulatory Commission (FERC) Order No. 1000, including the following:

- The sharing of information about the respective needs of each region and potential solutions to these needs
- The identification and joint evaluation of interregional transmission facilities that may be more efficient or cost-effective solutions to these regional needs

This report summarizes the 2014 and 2015 interregional planning activities under the responsibilities of the Joint ISO/RTO Planning Committee (JIPC). The report also references other interregional planning activities, including those associated with the work of the North American Electric Reliability Corporation (NERC).

## 1. Executive Summary

Through their interregional processes, the New York Independent System Operator (NYISO), ISO New England (ISO-NE), and PJM must identify and resolve planning issues with potential interregional impacts, consistent with North American Electric Reliability Corporation (NERC) reliability requirements and other applicable state and local reliability criteria.<sup>1</sup> Interconnections with neighboring systems provide opportunities for the exchange of capacity and energy, and tie lines facilitate access to a diversity of resources and potential economic opportunities for energy exchange.<sup>2</sup> In its Order No. 1000, the Federal Energy Regulatory Commission (FERC) emphasized the importance of implementing processes for identifying and quantifying the potential benefits and other impacts of interregional transmission projects and system reinforcements and coordinating the planning of the interconnected system.<sup>3</sup>

PJM, ISO-NE, and NYISO participate in numerous national and interregional planning activities with NERC and its regional entities—the Northeast Power Coordinating Council (NPCC) and ReliabilityFirst Corporation (RFC)—and other balancing authority areas in the United States and Canada.<sup>4</sup> The three entities proactively coordinate planning activities, such as interconnection and transmission studies, with neighboring ISO/RTO systems across the Eastern Interconnection through the Eastern Interconnection Planning Collaborative (EIPC) and work closely with each other as needed to conduct interregional reliability and production cost studies. The aim of these coordinated planning efforts is to enhance the widespread reliability and efficiency of the interregional electric power system.

The three entities follow the *Amended and Restated Northeastern ISO/RTO Planning Coordination Protocol* (Amended Planning Protocol) to enhance the coordination of their planning activities and address interregional planning issues.<sup>5</sup> To implement the original protocol (effective in 2004), the

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<sup>1</sup> More information about NERC is available at <http://www.nerc.com/>. See also the *Northeast Power Coordinating Council (NPCC) Regional Reliability Reference Directory #1—Design and Operation of the Bulk Power System* (December 1, 2009), [https://www.npcc.org/Standards/Directories/Directory\\_1\\_TFCP\\_rev\\_20151001\\_GJD.pdf](https://www.npcc.org/Standards/Directories/Directory_1_TFCP_rev_20151001_GJD.pdf); *ISO-NE Planning Procedure 3—Reliability Standards for the New England Area Bulk Power Supply System* (March 1, 2013), [http://www.iso-ne.com/rules\\_proceeds/isone\\_plan/pp03/pp3\\_final.pdf](http://www.iso-ne.com/rules_proceeds/isone_plan/pp03/pp3_final.pdf); and *New York State Reliability Council Reliability Rules and Compliance Manual* (August 14, 2015), <http://www.nysrc.org/pdf/Reliability%20Rules%20Manuals/RRC%20Manual%20V35%20Final%208-14-15.pdf>.

<sup>2</sup> NYISO and PJM, and NYISO and ISO-NE, have coordinated transaction scheduling, which features scheduling every 15 minutes, external transaction bidding, coordinated economic clearing of transactions, and the elimination of fees and charges for interface bids. See the NYISO webpage, “Markets & Operations,” at [http://www.nyiso.com/public/markets\\_operations/index.jsp](http://www.nyiso.com/public/markets_operations/index.jsp).

<sup>3</sup> FERC, *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 18 CFR Part 35, 136 FERC ¶ 61,051 (July 21, 2011) (Order No. 1000).

<sup>4</sup> For compliance with NERC reliability standards, a *balancing authority area* comprises the generation, transmission, and loads within metered boundaries for which a responsible entity (defined by NERC to be a balancing authority) integrates resource plans for that area, maintains the area's load-resource balance, and supports the area's interconnection frequency in real time.

<sup>5</sup> PJM, NYISO, and ISO-NE, *Amended and Restated Northeastern ISO/RTO Planning Coordination Protocol* (Amended Planning Protocol) (July 13, 2015), [http://www.iso-ne.com/static-assets/documents/2015/07/northeastern\\_protocol\\_dmeast.doc](http://www.iso-ne.com/static-assets/documents/2015/07/northeastern_protocol_dmeast.doc). Hydro-Québec TransÉnergie, the Independent Electric System Operator of Ontario (IESO), and the Transmission and System Operator Division of New Brunswick Power participate in the protocol on a limited basis to share data and information.

group formed the Joint ISO/RTO Planning Committee (JIPC) and the Interregional Planning Stakeholder Advisory Committee (IPSAC) open stakeholder group.<sup>6</sup> Through the open stakeholder process, the JIPC addresses interregional issues, including system needs and proposed system improvements, resource diversity, environmental compliance obligations, and resource retirements, in addition to the integration of distributed and variable energy resources.

The *2015 Northeast Coordinated System Plan* (NCSP15) documents activities during 2014 and 2015 under the provisions of the original and amended protocols and other documents FERC accepted in response to the interregional requirements of its Order No. 1000.<sup>7</sup> NCSP15 builds on the interregional planning activities summarized in the *2013 Northeast Coordinated System Plan* (NCSP13), emphasizing interregional planning activities under the Amended Planning Protocol and summarizing several of the planning issues the three ISO/RTOs are addressing.

The interregional planning activities under the protocol during 2014 and 2015 did not identify any need for new interregional transmission facilities, although the ISO/RTOs continue to evaluate interregional needs that arise.

## 2. FERC Order No. 1000: Transmission Planning and Cost Allocation

FERC Order No. 1000, issued on July 21, 2011, includes planning requirements, as follows, for all jurisdictional transmission providers, including ISOs and RTOs:<sup>8</sup>

- Establish interregional planning procedures and cost allocation between neighboring regions
- Remove tariff provisions that may provide a federal right of first refusal (ROFR) for incumbent transmission owners
- Provide an open and transparent process for soliciting and selecting more efficient or cost effective transmission projects for cost allocation and inclusion in the regional plan
- Incorporate public policy considerations into the planning process

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<sup>6</sup> All IPSAC presentations, studies, and other supporting material is available at each ISO/RTO's website: <http://www.pjm.com/committees-and-groups/stakeholder-meetings/stakeholder-groups/ipsac-ny-ne.aspx>; [http://www.nyiso.com/public/markets\\_operations/services/planning/groups/ipsac/index.jsp](http://www.nyiso.com/public/markets_operations/services/planning/groups/ipsac/index.jsp); and <http://www.iso-ne.com/committees/planning/ipsac>.

<sup>7</sup> See (1) the Amended Planning Protocol; (2) ISO-NE, NYISO, and PJM, *Filing of Amended and Restated Northeastern ISO/RTO Planning Coordination Protocol on behalf of ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, L.L.C.*, Docket No. ER13-\_\_\_-000 (July 10, 2013), [http://www.iso-ne.com/regulatory/ferc/filings/2013/jul/er13-1957-000\\_7-10-2013\\_protocol.pdf](http://www.iso-ne.com/regulatory/ferc/filings/2013/jul/er13-1957-000_7-10-2013_protocol.pdf); and (3) FERC, *Order 1000 Compliance Filing*, Docket Nos. ER13-1957-001, ER13-1942-001, ER13-1946-001, ER13-1960-001, ER13-1947-001, and ER15-2200-000, final order (November 19, 2015), [http://www.iso-ne.com/static-assets/documents/2015/11/er13-1957-001\\_er13-1960-001\\_ltr\\_order\\_accept\\_regional\\_transmission\\_require\\_cost\\_allocation\\_order\\_1000.pdf](http://www.iso-ne.com/static-assets/documents/2015/11/er13-1957-001_er13-1960-001_ltr_order_accept_regional_transmission_require_cost_allocation_order_1000.pdf). NYISO, PJM, and ISO-NE also made separate filings of tariff and agreement changes to reflect compliance with interregional requirements of Order No. 1000.

<sup>8</sup> FERC, *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 18 CFR Part 35, 136 FERC ¶ 61,051 (July 21, 2011) (Order No. 1000). Also see additional Order No. 1000 filings and materials.

Order No. 1000 builds on FERC Order No. 890 requirements, which expanded regional planning to include economic planning and cost allocation.<sup>9</sup>

While in many ways already meeting or exceeding the interregional planning requirements formalized by FERC in Order No. 1000, NYISO, ISO-NE, and PJM worked together and with their stakeholders during 2012, 2013, and 2015 to revise the Northeastern ISO/RTO Planning Coordination Protocol for meeting the requirements of Order No. 1000.<sup>10</sup> Many of the interregional activities during 2014 and 2015 focused on satisfying these compliance requirements. A high-level overview of the interregional planning requirements of Order No. 1000 follows.

### 2.1 Interregional Coordination Requirements

Order No. 1000 required each pair of neighboring transmission providers to include interregional coordination procedures in their respective tariffs. Specifically, the order required all transmission providers to develop further procedures with neighboring regions to provide for the following:

- The sharing of information regarding the respective needs of each region and potential solutions to these needs
- The identification and joint evaluation of interregional transmission facilities that may be more efficient or cost-effective solutions to these regional needs

FERC emphasized the central importance of the regional planning processes, noting that interregional transmission coordination should complement local and regional transmission planning processes and not substitute for these processes. The periodic review of each ISO/RTO's regional plan identifies the potential need for interregional transmission projects. Consistent with the applicable FERC regulations, the Amended Planning Protocol provides that interregional planning is an integral part of each regional process.

Order No. 1000 also requires the development of specific interregional coordination procedures, including a procedure to identify and jointly evaluate interregional transmission facilities proposed to be located in neighboring transmission planning regions. Additionally, the order requires a developer of an interregional transmission project to first propose its project through the regional transmission planning processes of each of the neighboring regions where the facility is proposed to be located. The interregional evaluation must be conducted in the same general timeframe as each regional evaluation.

### 2.2 Cost-Allocation Requirements

Another Order No. 1000 requirement is for each pair of neighboring transmission providers to include interregional cost-allocation procedures in their tariffs. For both regional and interregional cost allocation, Order No. 1000 adopted a principles-based, rather than a "one-size-fits-all," approach and recognized that regional differences may warrant different methodologies. FERC

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<sup>9</sup> FERC, *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, 18 CFR Parts 35 and 37, FERC Stats. and Regs. ¶ 31,241 (February 16, 2007).

<sup>10</sup> PJM, NYISO, and ISO-NE, *Amended and Restated Northeastern ISO/RTO Planning Coordination Protocol* (Amended Planning Protocol) (July 13, 2015), [http://www.iso-ne.com/static-assets/documents/2015/07/northeastern\\_protocol\\_dmeast.doc](http://www.iso-ne.com/static-assets/documents/2015/07/northeastern_protocol_dmeast.doc).

determined that the interregional cost-allocation method two regions agree to may differ from their respective regional cost-allocation methodologies. Also, the method to allocate a region's share of the costs for an interregional facility may differ from the method the respective regions use to allocate the costs of a regional facility. The order requires all transmission providers to demonstrate compliance with six cost-allocation principles—with variants for both regional and interregional cost allocation.<sup>11</sup> Both regional planning processes must first select an interregional project for it to receive cost allocation under the interregional cost-allocation process.

The default cost-allocation methodology for interregional projects filed by the ISO/RTOs and accepted by FERC is based on the avoided costs of the respective regional projects the interregional solution would replace.<sup>12</sup>

### 2.3 Compliance Filings for Interregional Order No. 1000

Order No. 1000 encouraged—but did not require—multilateral or interconnection-wide planning processes. In response, ISO-NE, NYISO, and PJM modified its original protocol to provide for a multilateral planning process among the three regions, which it embodied in the Amended Planning Protocol. The three regions further submitted accompanying tariff provisions for cost allocation.

The July 2015 filing of the Amended Planning Protocol reflects the regions' proposed compliance with Order No. 1000's interregional coordination requirements, including the efforts of the three regions, their stakeholders, and the Interregional Planning Stakeholder Advisory Committee (IPSAC), which has discussed the process for developing interregional projects and addressing cost-allocation issues.<sup>13</sup> The Amended Planning Protocol includes the following:

- Committee structure (Section 2)
- Information and data-sharing provisions (Section 3)
- An analysis of interconnection queue requests (Section 4)
- An analysis of long-term firm transmission service requests (Section 5)
- A periodic interregional assessment and system planning expansion studies (Section 6)
- Identification and evaluation of potential interregional transmission projects (Section 7)
- The NCSP (Section 8)
- Cost-allocation provisions and references to governing documents and rights of the parties, transmission owners, and market participants (Section 9)

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<sup>11</sup> See, generally, FERC Order No. 1000 at ¶¶ 612-685 (<http://www.ferc.gov/whats-new/comm-meet/2011/072111/E-6.pdf>).

<sup>12</sup> See the pertinent portions of the July 10, 2013, filings in FERC Docket Nos. ER13-1926 (PJM transmission owners), ER13-1942 (NYISO transmission owners), and ER13-1960 (ISO-NE transmission owners).

<sup>13</sup> IPSAC is an open stakeholder group that supports the comprehensive interregional planning process implemented by the three ISO/RTOs under the *Amended Planning Protocol*. ISO-NE materials for the IPSAC meetings are posted at [http://www.iso-ne.com/committees/comm\\_wkgrps/otr/ipsac/mtrls/index.html](http://www.iso-ne.com/committees/comm_wkgrps/otr/ipsac/mtrls/index.html). PJM materials are posted at <http://www.pjm.com/committees-and-groups/stakeholder-meetings/stakeholder-groups/ipsac-midwest.aspx>. NYISO materials are posted at [http://www.nyiso.com/public/committees/documents.jsp?com=oc\\_ipsac](http://www.nyiso.com/public/committees/documents.jsp?com=oc_ipsac). For access to the protected NYISO IPSAC site, please contact the NYISO Customer Service Department at (518) 356-6060 or [http://www.nyiso.com/public/services/customer\\_relations/index.jsp](http://www.nyiso.com/public/services/customer_relations/index.jsp).



- Other general provisions (Section 10)

On November 19, 2015, FERC accepted the ISO/RTOs' filings, including the Amended Planning Protocol and cost-allocation methodology, as compliant with the interregional requirements of Order No. 1000.<sup>14</sup>

### 3. Implementation of the Interregional Planning Process under Order No. 1000

Under FERC Order No. 1000, regional planning is the foundation for interregional planning, which includes requests for interconnection to the transmission system and for transmission service that may have cross-border impacts. Each ISO/RTO has a regional planning process and timelines and an open stakeholder process for informing regional stakeholders of regional system needs (whether driven by reliability, economic, or public policy requirements), and opportunities for satisfying these needs.

The ISO/RTOs' system plans identify system needs and plans for meeting these needs in accordance with their respective Open-Access Transmission Tariffs (OATTs). PJM, NYISO, and ISO-NE coordinate these short- and long-term system needs and plans with neighboring systems to identify opportunities for interregional system improvements. Projects in the respective ISO/RTO interconnection queues may also have potential interregional effects on neighboring systems, which requires coordinating studies across ISO/RTO borders. Stakeholders are encouraged to engage in the regional stakeholder processes, as well as the IPSAC, to more fully understand interregional planning issues.

This section summarizes the respective ISO/RTOs' system planning processes, including the timing of their planning cycles. The section also provides references for each systems' planning study results and other key documents.

#### 3.1 PJM

The PJM regional processes include transmission developments that satisfy reliability, market efficiency, operational performance, and public policy needs. The interregional process and opportunities can be followed through participation in PJM stakeholder activities.<sup>15</sup>

The PJM Transmission Expansion Advisory Committee (TEAC) meetings and meeting materials are open and available to the public for monitoring all PJM transmission-expansion needs and potential solutions for the entire PJM bulk electric system as they are developed by PJM staff. This information is essential in evaluating proposals for interregional transmission projects, which must

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<sup>14</sup> FERC, Docket Nos. ER13-1957-001, ER13-1942-001, ER13-1946-001, ER13-1960-001, ER13-1947-001, and ER15-2200-000, *Acceptance for Filing* (November 19, 2015); see also ISO New England Inc., 151 FERC ¶ 61,133 (2015).

<sup>15</sup> Obtaining a PJM account and sign in enables easy access to training, committee activities, notifications, and in-person/WebEx meetings. Find this resource on the PJM home page at <http://www.pjm.com/>.

satisfy needs in more than one region and be a more efficient or cost-effective solution compared with the regional solution.<sup>16</sup>

PJM's annual Regional Transmission Expansion Plan (RTEP) Report describes transmission study input data, processes, and results, as well as PJM board-approved transmission upgrades and process changes during the previous year. Periodically, PJM publishes white papers that present study input parameters and address transmission planning topics of current stakeholder interest.<sup>17</sup>

PJM load forecasts and associated materials are of particular interest in 2016 because PJM has comprehensively updated and improved the process, resulting in significantly improved load forecast accuracy in terms of a reduction in forecast model error.<sup>18</sup>

Enhancements in PJM include the following:

- A reduction in weather data to 20 years of history from 40 years
- The integration into the forecast of load response to weather variables for cooling, heating, and "other" to account for trends in equipment and appliance saturation and efficiency
- Refinements to weather factors used in the forecast
- The reflection of distributed solar generation in the historical load data used to estimate the models and the use of a separately-derived solar forecast to adjust the load forecasts

Interregional projects are proposed in PJM's competitive transmission solution solicitation ("windows") process and specified as an interregional project proposal.<sup>19</sup> PJM's information on regional and interregional planning provides interested stakeholders with necessary PJM information to prepare for participation in interregional planning under the Amended Planning Protocol and the Northeast protocol version of IPSAC (note that a Midcontinent version of the IPSAC also exists).

As shown in Figure 3-1 and Figure 3-2, PJM follows annual and two-year planning cycles to meet reliability and market-efficiency requirements. In practice, most of the reliability planning occurs in the annual cycle of criteria evaluations. Longer-term or more complex reliability issues and market-efficiency issues are generally addressed in the two-year cycle. Interregional projects may be presented in any PJM proposal window; however, the long-term window of the two-year cycle is likely to be the most realistic option for coordinating with the schedules of neighboring regions.

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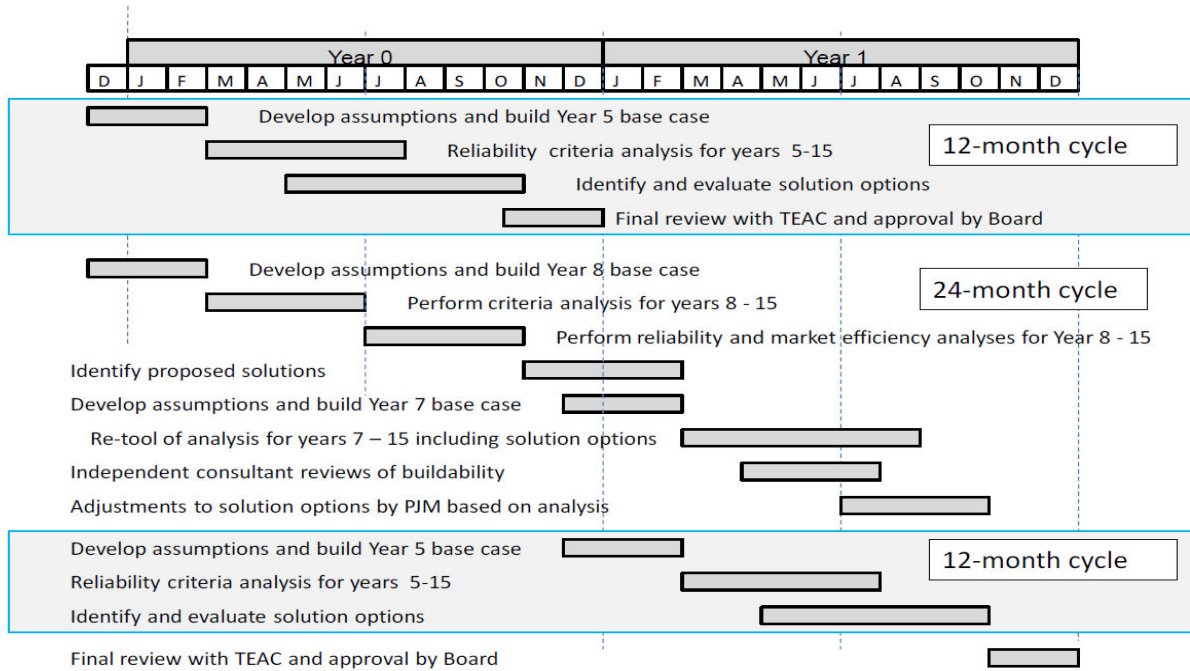
<sup>16</sup> Information on PJM's TEAC is available at <http://pjm.com/committees-and-groups/committees/teac.aspx>.

<sup>17</sup> Information on PJM's RTEP and related reports is available at <http://pjm.com/documents/reports/rtep-documents.aspx>.

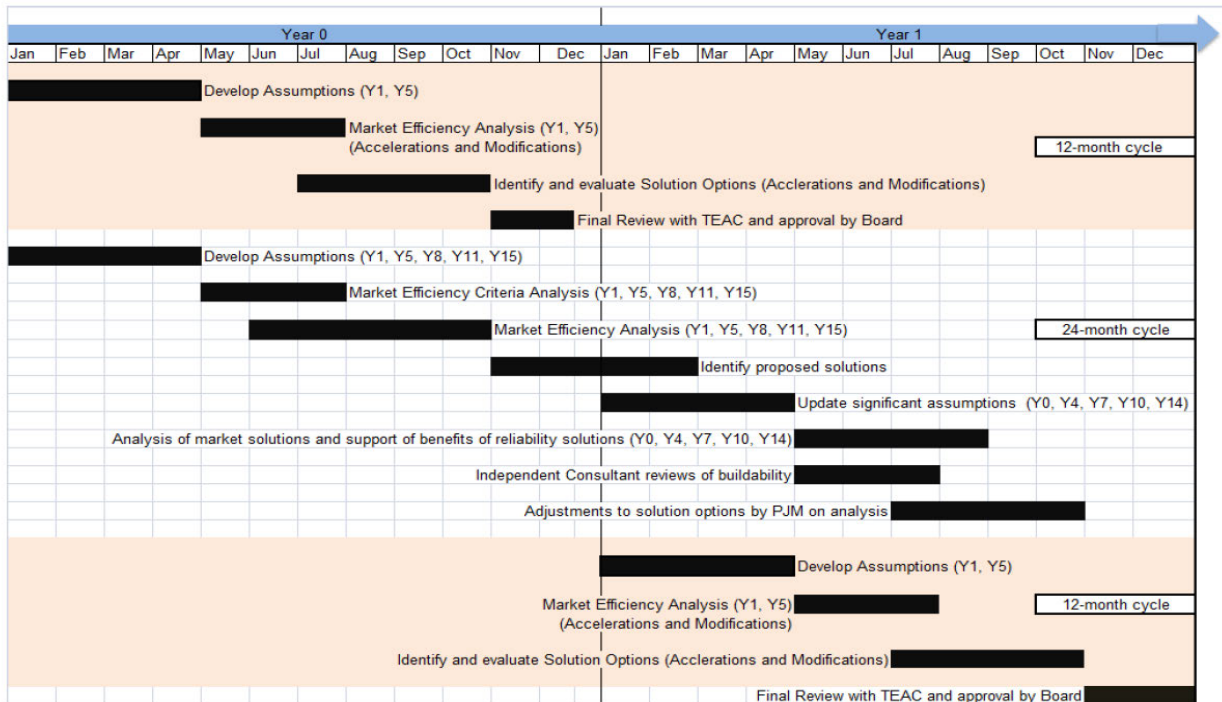
<sup>18</sup> Information on these changes is available at PJM's "Load Forecast Development Process," webpage; <http://www.pjm.com/planning/resource-adequacy-planning/load-forecast-dev-process.aspx>.

<sup>19</sup> Additional information on this competitive transmission solution solicitation process is available at PJM's "FERC Order 1000 Implementation" webpage; <http://pjm.com/planning/rtep-development/expansion-plan-process/ferc-order-1000.aspx>. Information on generator interconnections, merchant transmission, long-term firm transmission service requests, customer information, generator deactivation requests, and other relevant PJM planning information is available at PJM's "Planning" webpage; <http://pjm.com/planning.aspx>. PJM's posted material on interregional planning under the Amended Planning Protocol is available at its "Inter-Regional Planning Stakeholder Advisory Committee - New York / New England" webpage; <http://www.pjm.com/committees-and-groups/stakeholder-meetings/stakeholder-groups/ipsac-ny-ne.aspx>.

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**Figure 3-1: PJM's Two-Year Reliability Planning Cycle.**



**Figure 3-2: PJM's Two-Year Market-Efficiency Planning Cycle.**

### 3.2 NYISO

The NYISO's Comprehensive System Planning Process (CSPP) provides for evaluation of transmission, generation, and demand-side solutions on a comparable basis to address reliability, economic, and public policy issues. The NYISO identifies reliability needs, economic congestion, and public policy needs and administers a process whereby solutions are proposed, evaluated, and implemented.

The Reliability Planning Process (RPP)<sup>20</sup> component of the CSPP is a biennial process that consists of two studies: the Reliability Needs Assessment (RNA) and the Comprehensive Reliability Plan (CRP). The RNA evaluates the resource adequacy and transmission system security of the New York bulk power system over a ten year study period, identifying Reliability Needs in accordance with applicable reliability criteria. After the RNA is complete, the NYISO requests the submission of solutions to satisfy the Reliability Needs. The CRP sets forth the NYISO's findings regarding the proposed solutions and its plan to maintain reliability for the ten year study period. The NYISO completed its 2014 CRP<sup>21</sup> in July 2015 and the 2016 RNA will begin in April 2016.

Congestion Assessment and Resource Integration Studies (CARIS)<sup>22</sup> is the economic planning process component of the CSPP based on the CRP and it is also a biennial study. CARIS Phase 1 examines congestion on the New York bulk power system, and the costs and benefits of generic alternatives to alleviate that congestion. During CARIS Phase 2, the NYISO evaluates specific transmission project proposals for regulated cost recovery. The 2015 CARIS I report was published in November 2015 and the 2016 CARIS Phase 2 study is currently underway.<sup>23</sup>

The latest component of the CSPP is the Public Policy Transmission Planning Process.<sup>24</sup> Under this process, interested parties propose and the New York State Public Service Commission (NYPSC) identifies transmission needs driven by Public Policy Requirements. A Public Policy Requirement is defined as a federal, state, or local law or regulation that drives the need for transmission. Phase 1 of the Public Policy Transmission Planning Process involves identifying needs and soliciting solutions. The NYISO then evaluates the viability and sufficiency of the proposed solutions to satisfy each identified Public Policy Transmission Need. In Phase 2, the NYISO evaluates and may select the more efficient or cost-effective transmission solution to each identified need. The NYISO is

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<sup>20</sup> NYISO, *Reliability Planning Process Manual* (December 2014), [http://www.nyiso.com/public/webdocs/markets\\_operations/documents/Manuals\\_and\\_Guides/Manuals/Planning/rpp\\_mnl.pdf](http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/rpp_mnl.pdf).

<sup>21</sup> NYISO, *2014 Comprehensive Reliability Plan* (July 21, 2015), [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Reliability\\_Planning\\_Studies/Reliability\\_Assessment\\_Documents/2014CRP\\_Final\\_20150721.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2014CRP_Final_20150721.pdf).

<sup>22</sup> NYISO, *Economic Planning Process Manual—Congestion Assessment and Resource Integration Studies (CARIS)* (May 2014), [http://www.nyiso.com/public/webdocs/markets\\_operations/documents/Manuals\\_and\\_Guides/Manuals/Planning/epp\\_caris\\_mnl.pdf](http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/epp_caris_mnl.pdf).

<sup>23</sup> NYISO, *2015 Congestion Assessment and Resource Integration Study* (November 17, 2015), [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Economic\\_Planning\\_Studies\\_\(CARIS\)/CARIS\\_Final\\_Reports/2015\\_CARIS\\_Report\\_FINAL.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Economic_Planning_Studies_(CARIS)/CARIS_Final_Reports/2015_CARIS_Report_FINAL.pdf).

<sup>24</sup> NYISO, *Public Policy Transmission Planning Process Manual* (July 2015), [http://www.nyiso.com/public/webdocs/markets\\_operations/documents/Manuals\\_and\\_Guides/Manuals/Planning/M-36\\_Public%20Policy%20Manual\\_v1\\_0\\_Final.pdf](http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/M-36_Public%20Policy%20Manual_v1_0_Final.pdf).

currently conducting Phase 1 for the Western NY Public Policy Transmission Need to add transfer capability from western New York for hydroelectric output and Canadian resource imports<sup>25</sup> and is evaluating the viability and sufficiency of the proposed solutions. The NYISO has also commenced Phase 1 for the AC Transmission Public Policy Transmission Need to increase transfer capability across the Central East and UPNY/SENY transmission interfaces in New York,<sup>26</sup> by issuing a solicitation for solutions on February 29, 2016; responses are due April 29, 2016.

Interregional planning is conducted with the NYISO's neighboring control areas in the United States and Canada under the Amended Planning Protocol. Interregional Transmission Projects are proposed at the same time as regional solutions in accordance with the NYISO CSPP. The NYISO's RNA, CRP, CARIS, and Public Policy Transmission Planning reports provide interested parties with the necessary information to prepare for participation in interregional planning under the Amended Planning Protocol.

### 3.3 ISO New England

The ISO New England planning process continuously and comprehensively identifies system needs and solutions to meet these needs, such as upgrades to the transmission system, market responses, generation, or demand response. Through an open and transparent process, ISO-NE discusses study scopes of work, assumptions, and draft results with stakeholders.<sup>27</sup> The discussions address the following topics:

- Forecasts of the region's annual and peak energy use
- Energy efficiency and photovoltaic (PV) development
- Analyses of the amount, operating characteristics, and locations of needed capacity and operating reserves
- Assessments of needs and transmission solutions to meet these needs
- Planning coordination studies and initiatives affecting the interregional planning of the system
- Fuel certainty issues and how these issues are being addressed

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<sup>25</sup> NYPSC, *Order Addressing Public Policy Requirements for Transmission Planning Purposes*, Western New York Public Policy Transmission Need Order (July 20, 2015), [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/Public\\_Policy\\_Transmission\\_Needs/2015\\_07\\_20\\_PSC\\_Order\\_NYISO\\_Pblc\\_Plcy\\_Trnsmsn\\_Nds\\_14-E-0454.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Public_Policy_Transmission_Needs/2015_07_20_PSC_Order_NYISO_Pblc_Plcy_Trnsmsn_Nds_14-E-0454.pdf).

<sup>26</sup> NYPSC, *Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades*, AC transmission public policy transmission need order (December 17, 2015), [http://www.nyiso.com/public/webdocs/markets\\_operations/services/planning/Planning\\_Studies/Public\\_Policy\\_Documents/Public\\_Policy\\_Transmission\\_Needs/2015-12-17\\_PSC\\_Order\\_AC\\_Transmission.pdf](http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Public_Policy_Documents/Public_Policy_Transmission_Needs/2015-12-17_PSC_Order_AC_Transmission.pdf).

<sup>27</sup> The ISO planning process is documented on its website at <http://www.iso-ne.com/system-planning>. The *Transmission Planning Process Guide* outlines the steps in the regional system planning process. The *Transmission Planning Technical Guide* documents several assumptions used in ISO planning studies. The guides are available at <http://www.iso-ne.com/system-planning/transmission-planning/transmission-planning-guides>. Also see ISO-NE, *2015 Regional System Plan* (November 5, 2015); *Open Access Transmission Tariff* (December 15, 2015); *2015 Capacity, Energy, Loads, and Transmission (CELT) Forecast Report*, (May 15, 2015). Earlier ISO-NE CELT reports are available at <http://www.iso-ne.com/system-planning/system-plans-studies/celt>.

- Effects of generator compliance with environmental regulations on generator operating requirements and the need for remediation measures
- Operating and planning for expansion of renewable resources, including wind generation and photovoltaic resources
- Development and integration of new technologies
- Enhancements to operating and planning procedures affecting reliability

ISO-NE's stakeholder planning forum is the Planning Advisory Committee (PAC).<sup>28</sup> PAC membership is open to all and currently includes representatives from state and federal governmental agencies; participating transmission owners (PTOs); ISO-NE market participants; other New England Power Pool (NEPOOL) members; consulting companies; manufacturers; and other organizations, such as universities and environmental groups.<sup>29</sup>

ISO-NE's Regional System Plan (RSP) is the culmination of a process with industry representatives and other stakeholders to analyze power system needs and solutions over a 10-year planning horizon.<sup>30</sup> RSP15 summarizes the region's planning issues, including demand forecasts, capacity issues, transmission system needs and solutions, market resource alternatives to transmission development, strategic planning issues, compliance with the FERC Order No. 1000, and other ISO initiatives. In addition to publishing the Regional System Plan and specific transmission needs assessments and solutions studies, the ISO issues the *RSP Project List*.<sup>31</sup> The list includes the status of transmission upgrades during a project's lifecycle and is updated several times per year.

ISO-NE studies evaluate proposed interconnections to and transmission service over the New England transmission system for projects listed in the ISO's Interconnection Request Queue.<sup>32</sup> The studies are continuously performed to ensure that system reliability criteria and standards for no adverse impact are met. They typically consist of thermal, voltage, stability, and short-circuit analyses and address the following topics:

- Interconnections of proposed generators
- Requests for an elective transmission expansion
- Requests for transmission service

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<sup>28</sup> Any stakeholder can designate a representative to the PAC by providing written notice to ISO-NE. PAC materials are available at [http://www.iso-ne.com/committees/comm\\_wkgrps/prtcnts\\_comm/pac/index.html](http://www.iso-ne.com/committees/comm_wkgrps/prtcnts_comm/pac/index.html). PAC agendas; minutes; materials; draft reports, including stakeholder questions and ISO responses; and final reports are posted on the ISO-NE website.

<sup>29</sup> NEPOOL members serve as ISO stakeholders and market participants. More information on NEPOOL participants is available at <http://www.iso-ne.com/participate/governing-agreements/nepool-agreement>.

<sup>30</sup> ISO-NE, *2015 Regional System Plan* (November 5, 2015), [http://www.iso-ne.com/static-assets/documents/2015/11/rsp15\\_final\\_110515.docx](http://www.iso-ne.com/static-assets/documents/2015/11/rsp15_final_110515.docx). The ISO-NE board of directors approved the annual plan on November 5, 2015. Historically, the Regional System Plan was published annually. The ISO, however, is now planning on publishing RSPs every odd-numbered year (with the next one scheduled for 2017).

<sup>31</sup> The *RSP Project List* is posted at <http://www.iso-ne.com/system-planning/system-plans-studies/rsp>.

<sup>32</sup> See the latest information on ISO-NE studies at <http://www.iso-ne.com/system-planning/system-plans-studies/interconnection-request-studies>.

ISO-NE makes available the databases used in its analyses and other relevant information required to perform simulations consistent with FERC policies and the ISO-NE Information Policy requirements pertaining to confidential information and critical energy infrastructure information (CEII) requirements. Stakeholders can access the Forecast Report of Capacity, Energy, Loads, and Transmission (CELT) to obtain key data of the New England system.<sup>33</sup> In addition, power system models are available to stakeholders wishing to conduct their own independent studies.

### 4. Coordination of the Needs of the ISO/RTO Systems with Transmission Projects with Potential Interregional Impacts

The ISO/RTOs are implementing changes to their respective regional planning processes in parallel with changes to the interregional planning process. The Joint ISO/RTO Planning Committee (JIPC), consisting of representatives of the three ISO/RTOs, coordinates and reconciles the regional practices and assumptions used for interregional planning. The JIPC and stakeholders have reviewed the interregional planning timelines in conjunction with the regional planning cycles, and the JIPC has concluded that the interregional planning cycle effectively coordinates with the respective regional timelines.<sup>34</sup>

All three ISO/RTOs issue long-term planning assessments and allow for qualified transmission providers to propose solutions through a competitive process. The completion dates of individual ISO/RTO studies and reports differ, but the coordination of planning activities across system borders occurs continuously. Table 4-1 summarizes several key completion dates for the ISO/RTOs.

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<sup>33</sup> The CELT report is posted at <http://www.iso-ne.com/system-planning/system-plans-studies/celt>. Stakeholders also can obtain publicly available models of the transmission system network through the FERC 715 process, which requires transmitting utilities that operate facilities rated at or above 100 kV to submit information to FERC annually; see <http://www.ferc.gov/docs-filing/forms/form-715/overview.asp>. *ISO New England Information Policy* (ISO tariff, Attachment D) (2015) contains the requirements for controlling the disclosure of CEII and confidential information; see [http://www.iso-ne.com/static-assets/documents/regulatory/tariff/attach\\_d/attachment\\_d.pdf](http://www.iso-ne.com/static-assets/documents/regulatory/tariff/attach_d/attachment_d.pdf). Access to CEII materials can be gained by contacting ISO Customer Service at 413-540-4220 or [custserv@iso-ne.com](mailto:custserv@iso-ne.com).

<sup>34</sup> See the December 14, 2015, IPSAC discussion, "Interregional Planning Timelines in the Context of Order 1000" at [http://www.iso-ne.com/static-assets/documents/2015/12/121415\\_ipsac\\_interregional\\_timelines.pdf](http://www.iso-ne.com/static-assets/documents/2015/12/121415_ipsac_interregional_timelines.pdf).

**Table 4-1  
Timing of Regional Planning Activities with Interregional Planning Requirements**

Key Activity that Affects Interregional Planning	ISO/RTO		
	NYISO	PJM	ISO-NE
Reliability needs	Continuously; summarized in a report every even year	Continuously identified and reported to stakeholders throughout the year; summarized in an annual report	Continuously; summarized in a report the fourth quarter of every odd year
Reliability solutions	Continuously; summarized in a report every odd year	Potential solutions identified, evaluated, and selected throughout the year in a transparent process with stakeholders	Continuously; summarized three times per year in a project list; summarized in a report every odd year
Economic issues	Continuously; summarized in a report every odd year	Identified midyear of even calendar years and reported to stakeholders	Continuously
Economic solutions	Continuously; summarized in a report for each proposed project	Potential solutions identified November 1 of even years through February of odd years; solutions evaluated and selected in odd years	Continuously; summarized three times per year in a project list; summarized in a report every odd year
Public policy issues	To meet regional timing	To meet regional timing	To meet regional timing
Public policy solutions	Following identification of a public policy transmission need	Annually	At least once every three years

The three ISO/RTOs have coordinated data and planning models. PJM updates its demand forecasts annually every January, NYISO every April, and ISO-NE every May. Interconnection queues are publicly available, and PJM updates its interconnection queue continuously. NYISO and ISO-NE update their respective queues monthly. The ISO/RTOs annually coordinate their interregional power flow models, which are available to stakeholders subject to CEII and Information Policy constraints. The JIPC annually updates interregional production cost databases, typically by the fourth quarter. The ISO/RTOs also share resource adequacy databases, which are used in loss-of-load expectation analysis and other studies.

The JIPC seeks IPSAC review of potential opportunities where interregional projects might satisfy the needs of more than one region. Qualified transmission developers may submit proposals to two or more neighboring ISO/RTOs consistent with the requirements of the respective regional processes. This includes reliability projects, economic projects, public policy projects, and system interconnection projects planned by the respective regions.

The JIPC also coordinates studies needed to identify potential interregional impacts, as well as the system databases and models used in studies. The JIPC then identifies and evaluates the performance of projects affecting interregional system performance. Several interconnection studies of projects having potential interregional impacts were discussed with the IPSAC.<sup>35</sup> The

<sup>35</sup> See IPSAC presentation on December 14, 2015. [http://www.iso-ne.com/static-assets/documents/2015/12/121415\\_queue\\_interconnection.pdf](http://www.iso-ne.com/static-assets/documents/2015/12/121415_queue_interconnection.pdf).



studies include analyses of control system interactions among high-voltage direct current (HVDC) ties to ensure system stability and acceptable system response to loss-of-source contingencies.

The IPSAC discusses respective ISO/RTO system needs and transmission projects proposed and evaluated to address potential interregional impacts.<sup>36</sup> For example, IPSAC members discussed the Maine Power Reliability Program (MPRP), the New England East–West Solution (NEEWS), and the Long-Term Lower Southeastern Massachusetts (Lower SEMA) projects. Realistically, interconnections to neighboring systems could not meet the needs of these projects, which have been shown to have no adverse impact on neighboring systems.

As of December 1, 2015, no new need for transmission interconnections between the ISO/RTOs was identified, and no new interconnection projects were approved in 2014 to 2015. Previously approved new interconnections between PJM and NYISO were established during the past two years. A new 345/115 kV interconnection between PJM and NYISO was placed in service in November 2015. This interconnection established a new tie point near the central Pennsylvania border with New York on the Homer City–Watercure 345 kV line at the Mainesburg substation. This tie was initiated as a PJM baseline reliability project in 2011. A second new tie point project in the same general geographic area was planned as a PJM baseline reliability project in 2012. This project, expected to go into service in June 2016, will establish a new tie point on the Homer City–Stolle Road 345 kV line at the Farmers Valley substation.

## 5. Other Coordinated Planning Activities

The ISO/RTOs conduct studies as needed with other entities within and outside the region, including neighboring areas, that aim to, for example, improve production cost models, share simulation results, investigate the challenges to and possibilities for integrating renewable resources, and address other common issues affecting the planning of the overall system. The ISO/RTOs also participate in numerous interregional planning activities with other entities, including the Eastern Interconnection Planning Collaborative (EIPC), US Department of Energy (DOE), the North American Electric Reliability Corporation (NERC) and its regional reliability councils, and other planning authorities in the United States and Canada.<sup>37</sup> The overriding purpose of these involvements is to enhance the widespread reliability of the interregional electric power system.

This section discusses the main collaborative efforts the ISO/RTOs undertake with neighboring areas to analyze the interconnection-wide system, study and address interregional transfers and seams issues, and improve competitive electricity markets in North America.

### 5.1 Electric Reliability Organization (NERC) Overview, Long-Term Reliability Assessments, and Other Studies

Through its committee structure that includes the ISO/RTOs, NERC, which is the FERC-designated Electric Reliability Organization (ERO), regularly publishes reports that assess the reliability of the

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<sup>36</sup> See the December 14, 2015, IPSAC discussions, “Queue Interconnection Studies of Projects Potentially Affecting Neighboring Systems,” “NYISO Planning Update,” “PJM Regional Transmission Expansion Planning (RTEP 2015) Process,” and “2015 Regional System Plan (RSP15)” at <http://www.iso-ne.com/committees/planning/ipsac>.

<sup>37</sup> More information about NERC is available at <http://www.nerc.com/>.

North American electric power system. Annual long-term reliability assessments (LTRAs) evaluate the future adequacy of the power system in the United States and Canada for a 10-year period. The reports project electricity supply and demand, evaluate resource and transmission system adequacy, and discuss key issues and trends that could affect reliability. Summer and winter assessments evaluate the adequacy of electricity supplies in the United States and Canada for the upcoming peak demand periods in these seasons. Special regional, interregional, or interconnection-wide assessments are conducted as needed.

In December 2015, NERC issued its annual *Long-Term Reliability Assessment*, analyzing reliability conditions across the North American continent.<sup>38</sup> This report describes transmission additions, generation projections, and reserve capability by reliability council area. The 2015 LTRA identified four key findings that will have an impact on the long-term reliability of the North American bulk power system:

- Planning reserve margins in all assessment areas appear sufficient in the short-term but continue to trend downward.
- A changing resource mix requires additional measures and approaches for assessing future reliability
- Operators and planners face uncertainty with increased levels of distributed energy resources and new technologies.
- NERC continues its reliability assessment of the Clean Power Plan and other environmental rules.

### 5.2 Eastern Interconnection Planning Collaborative

The major electric power planning authorities of the Eastern Interconnection formed the Eastern Interconnection Planning Collaborative in 2009 to address their portion of North American planning issues, combine the existing regional transmission expansion plans, and analyze the interconnection-wide system. Twenty-four EIPC planning coordinators received a grant from DOE to develop an open and transparent stakeholder process and to conduct transmission planning analysis on the Eastern Interconnection system. The initial phase of the DOE project was completed, and a draft report was submitted to DOE on December 22, 2012.<sup>39</sup>

In February 2013, DOE provided technical guidance requesting that analyses be completed on the gas-electric system interface because this deserved more in-depth analysis than originally envisioned. The six participating planning authorities leading this portion of the DOE project study (known as the *Gas-Electric System Interface Study*) were ISO New England, NYISO, PJM, the Tennessee Valley Authority (TVA), Midcontinent ISO (MISO) (formerly the Midwest ISO), and Ontario's Independent Electricity System Operator (IESO). The results of the *Gas-Electric System Interface Study* provide a comprehensive analysis across the study region of the adequacy of the natural gas pipeline delivery system to meet the needs of gas-fired electric generation under

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<sup>38</sup> NERC, *2015 Long-Term Reliability Assessment* (December 2015), <http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015LTRA%20-%20Final%20Report.pdf>.

<sup>39</sup> See the EIPC, "Phase II Documents," webpage (2015), <http://www.eipconline.com/phase-ii-documents.html>.

various conditions over a 10-year horizon.<sup>40</sup> The final report closing out the grant was submitted to the DOE in June 2015, which DOE accepted in July 2015.

EIPC is continuing to coordinate interconnection-wide power flow base cases and conduct analyses without DOE funding. In 2014, EIPC completed the second year of its two-year planning cycle. The EIPC solicited and evaluated scenarios proposed by stakeholders and selected to model and study a severe heat wave and drought scenario in terms of a transfer analysis and comparison to the previous year's work. This work engaged stakeholders in webinars conducted on March 25, 2014; September 9, 2014; and November 21, 2014. The final work product is documented in a final report dated January 23, 2015.<sup>41</sup>

During 2015, EIPC initiated the first year of its new two-year planning cycle, again developing and studying new versions of the "roll-up" cases, which combined each region's electric power system plan into a comprehensive updated model of the Eastern Interconnection. This work effort expanded the roll-up cases to include models for summer and winter peak scenarios, which were rigorously tested under reference and transfer conditions using NERC criteria. Preliminary results were discussed with stakeholders on November 17, 2015. As of this writing, the preliminary results are undergoing final review and are expected to be reported in 2016.<sup>42</sup>

EIPC requested input from stakeholders for scenarios to be studied in 2016. The focus of EIPC's 2016 efforts will be to develop and analyze the roll-up cases for summer and winter 2025 under different planning scenarios. It also is considering developing, during 2016, a production cost database for the Eastern Interconnection. This would be the first such interconnection-wide reviewed database.

### 5.3 IRC Activities

Created in April 2003, the ISO/RTO Council (IRC) is an industry group consisting of the nine ISOs and RTOs in North America. These ISOs and RTOs serve two-thirds of the electricity customers in the United States and more than 50% of Canada's population. The IRC works collaboratively to develop effective processes, tools, and standard methods for improving the reliability, planning, and operation of competitive wholesale electricity markets across much of North America.

The IRC has coordinated a number of reports, filings, and presentations with national government agencies.<sup>43</sup> The IRC has worked with the US Environmental Protection Agency (EPA), the states, and all interested parties on proposed carbon dioxide (CO<sub>2</sub>) regulations that respect electric power system reliability and are compatible with the efficient dispatch of the electric power grid. Additionally, the IRC has submitted FERC filings on issues of common concern for its members, such as proposed changes to the gas operating day and interstate pipeline scheduling practices for

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<sup>40</sup> The 2015 EIPC *Gas-Electric Study* is available at <http://www.eipconline.com/phase-ii-documents.html>.

<sup>41</sup> EIPC, *2023 Roll-Up Update and Heat Wave and Drought Scenario*, final report (January 23, 2015), <http://nebula.wsimg.com/0ca33e3bfd7be8f37880ebaaa7146e2?AccessKeyId=E28DFA42F06A3AC21303&disposition=0&alloworigin=1>.

<sup>42</sup> Additional information on EIPC's 2015 *Report for 2025 Summer and Winter Roll-Up Integration Cases* is available at <http://www.eipconline.com/non-doe-documents.html>.

<sup>43</sup> IRC, "Reports and Filings," webpage (2014), <http://www.isorto.org/Reports/default>.

natural gas transportation service.<sup>44</sup> IRC members also have coordinated on a number of technical issues, such as the use of software and the sharing of planning techniques.

### 5.4 Northeast Power Coordinating Council

The Northeast Power Coordinating Council (NPCC) is one of eight regional entities located throughout the United States, Canada, and portions of Mexico responsible for enhancing and promoting the reliable and efficient operation of the interconnected bulk power system.<sup>45</sup> NERC has delegated NPCC the authority to create regional standards to enhance the reliability of the international, interconnected bulk power system in northeastern North America. As members of NPCC, ISO New England and NYISO fully participate in NPCC-coordinated interregional studies with its neighboring areas. PJM also directly participates in select study groups by coordinating data and providing analytical support, such as the review of draft assumptions and results.

NPCC establishes requirements for resource adequacy over the planning period. The analyses conducted determine the systemwide and local-area needs for resource adequacy and the region's efforts to meet the need for resources through markets, the interconnection queue, and energy-efficiency resources planned by the states.

NPCC also conducts seasonal reliability assessments, an annual long-range resource-adequacy evaluation, and a periodic assessment of the reliability of the planned NPCC bulk power system.<sup>46</sup> All studies are well coordinated across neighboring area boundaries and include the development of common databases that can serve as the basis for ISO/RTO internal studies. Assessments of both ISO-NE and NYISO demonstrated full compliance with NERC and NPCC requirements for meeting resource adequacy and transmission planning criteria and standards.

### 5.5 ReliabilityFirst

As one of the eight NERC-approved regional entities in North America, ReliabilityFirst Corporation (RFC) conducts a long-term transmission assessment annually to satisfy its responsibility to provide a judgment on the ability of the regional transmission system to operate reliably under the expected range of operating conditions over the applicable assessment period. RFC fulfills this responsibility by examining work already performed according to the planning processes of PJM, Midcontinent ISO (MISO), Midwest Reliability Organization (MRO), Southeast Electric Reliability Corporation (SERC), and Virginia-Carolinas Area (VACAR), and studies performed by the Eastern

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<sup>44</sup> ISO/RTO Council, *Coordination of the Scheduling Processes of Interstate Natural Gas Pipelines and Public Utilities*, comments, FERC filing (November 25, 2014), <http://www.isorto.org/ircreportsandfilings/iso-comments-to-ferc-regarding-coordination-of-interstate-natural-gas-pipelines-scheduling-processes> ([http://ircweb.businesscatalyst.com/Documents/Report/20141125\\_IRCCComments-FERC-InterstateNaturalGasPipelineScheduling.pdf](http://ircweb.businesscatalyst.com/Documents/Report/20141125_IRCCComments-FERC-InterstateNaturalGasPipelineScheduling.pdf)).

<sup>45</sup> The NPCC region covers nearly 1.2 million square miles populated by more than 55 million people. NPCC in the United States includes the six New England states and the state of New York. NPCC Canada includes the provinces of Ontario, Québec, and the Maritime provinces of New Brunswick and Nova Scotia. As full members, New Brunswick and Nova Scotia also ensure that NPCC reliability issues are addressed for Prince Edward Island. Additional information on NPCC is available at <http://www.npcc.org/>.

<sup>46</sup> NPCC seasonal reliability assessments are available in the NPCC library. For the most recent seasonal assessment, see the *NPCC Reliability Assessment for Winter 2015-2016* (December 1, 2015).

Interconnection Reliability Assessment Group (ERAG).<sup>47</sup> In addition, RFC performs its own long-term transmission assessment in conjunction with affected transmission owners, which includes identification, analysis, and projections of trends in transmission adequacy and other industry developments that may have an impact on future electric system reliability.<sup>48</sup>

## 6. Summary and Conclusions

Each ISO/RTO develops individual system reliability plans, production cost studies, and interconnection studies mindful of significant interregional impacts. To facilitate interregional coordination and communication among all interested parties, the JIPC and IPSAC were established to implement the Northeastern ISO/RTO Planning Coordination Protocol.

FERC Order No. 1000 affected regional and interregional transmission planning, cost allocation, and consideration of public policy requirements. The final rule required all transmission providers to develop further procedures with neighboring regions to provide for the following:

- Sharing information regarding the respective needs of each region and potential solutions to these needs
- Identifying and jointly evaluating interregional transmission facilities that may be more efficient or cost-effective solutions to these regional needs

ISO New England, NYISO, and PJM, with input from their stakeholders and IPSAC, jointly developed the Amended Planning Protocol and other documents that FERC has determined to comply with the interregional planning principles required by Order No. 1000. The three regions conducted NCSP15 in accordance with these requirements.

IPSAC discussions of system needs and a listing of recent projects in ISO New England, NYISO, and PJM have demonstrated that the ISO/RTOs coordinate with each other on issues that could affect the interregional performance of the overall system. This project listing contains reliability, economic, and system interconnection projects planned by their respective regions. To date, the ISO/RTOs have not identified the need for new interregional transmission projects that would be more effective or cost efficient in meeting the needs of multiple regions than proposed regional system improvements.

The ISO/RTOs have successfully implemented the *Amended and Restated Northeastern ISO/RTO Planning Protocol*, which has further improved interregional planning among neighboring areas and will continue to do so as part of regional compliance with Order No. 1000. NCSP15 shows that a number of enhancements to the interregional planning process have been achieved, including the timely exchange of needed databases and models required to perform planning studies. The ongoing nature of planning studies allows the ISO/RTOs to effectively align the timing of their interregional planning activities and studies. Interregional studies for resource adequacy, transmission planning, economic performance, and other issues have been well coordinated

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<sup>47</sup> Information on the Eastern Interconnection Reliability Assessment Group is available at <https://rfirst.org/reliability/easterninterconnectionreliabilityassessmentgroup/pages/default.aspx>.

<sup>48</sup> The most recent version of this work is documented at RFC's "Reliability Reports" webpage: <https://rfirst.org/reliability/Pages/ReliabilityReports.aspx>.

through the ISO/RTO interregional planning efforts described in this report. Interregional issues, such as the effects of environmental regulations and the development of renewable/intermittent resources, have also been well coordinated through the JIPC, IRC, and EIPC.

The ISO/RTOs will continue working together to improve their current methods of sharing system information for consideration in conducting joint and individual planning studies. The ISO/RTOs will also continue improving their level of coordination by enhancing the timelines and procedures for interregional planning.

The ISO/RTOs' planning activities are closely coordinated with neighboring systems. This NCSP report demonstrates the collaborative effort undertaken by ISO New England, NYISO, and PJM for continued interregional planning. Communication among the members of the JIPC has helped address regional needs as well as neighboring system concerns. Input from the IPSAC has provided additional perspectives in addressing current and future challenges, and stakeholder input will continue to provide valuable contributions in future planning cycles.

## 7. Acronyms

CO <sub>2</sub>	carbon dioxide
CARIS	Congestion Assessment and Resource Integration Study
CEII	Critical Energy Infrastructure Information
CELT	capacity, energy, loads, and transmission
CRP	Comprehensive Reliability Plan
CSPP	Comprehensive System Planning Process
DOE	US Department of Energy
EIPC	Eastern Interconnection Planning Collaborative
EPA	US Environmental Protection Agency
ERAG	Eastern Interconnection Reliability Assessment Group
ERO	Electric Reliability Organization
FERC	Federal Energy Regulatory Commission
HVDC	high-voltage direct current
IESO	Independent Electric System Operator of Ontario
IPEC	Indian Point Energy Center
IPSAC	Interregional Planning Stakeholder Advisory Committee
IRC	ISO/RTO Council
ISO-NE	Independent System Operator of New England
JIPC	Joint ISO/RTO Planning Committee
LTRA	long-term reliability assessment
MISO	Midcontinent Independent System Operator
MPRP	Maine Power Reliability Program
MRO	Midwest Reliability Organization
NCPC	Northeast Coordinated System Plan
NEEWS	New England East–West Solution
NEPOOL	New England Power Pool
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NYISO	New York Independent System Operator
NYSPSC	New York State Public Service Commission
OATT	Open Access Transmission Tariff
PAC	Planning Advisory Committee

PTO	participating transmission owner
PV	photovoltaic
RFC	Reliability <i>First</i> Corporation
RNA	Reliability Needs Assessment
ROFR	right-of-first-refusal
RPP	Reliability Planning Process
RSP	Regional System Plan
RTEP	Regional Transmission Expansion Plan
RTO	Regional Transmission Organization
SEMA	Southeastern Massachusetts
SERC	Southeast Electric Reliability Corporation
TEAC	Transmission Expansion Advisory Committee
TVA	Tennessee Valley Authority
VACAR	Virginia-Carolinas Area