

**Northeast
Utilities System**

LOCAL SYSTEM PLAN - 2009

Needs Assessment/Potential Solutions

Presented at Local System Plan Meeting October 21, 2009

Update to NU LSP Presented October 21, 2009

- The NU (Northeast Utilities) LSP (Local System Plan) has been revised to incorporate the latest proposed changes to the NU Local transmission system.
- This LSP-2009, supersedes the October 2008 Revision of NU's LSP-2008.

Purpose of Local System Plan

Per Attachment K – Local, the LSP is a report that:

- Describes projected improvements to non-PTF (Pool Transmission Facilities) that are needed to maintain system reliability
- Reflects:
 - LSP Needs Assessments
 - Corresponding transmission system planning and expansion studies
- Identifies:
 - Local Planning Process
 - Criteria, Data, and Assumptions
- Does not address generator interconnections associated with Distribution

LSP Communication

- ISO-NE posts the materials prior to the meeting.
- PAC, Transmission Customers, and other Stakeholders have 30 days after the meeting to provide any written comments for consideration by Northeast Utilities.

- Comments should be directed to Northeast Utilities' contact:

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LSP Communication (cont.)

- Each PTO (Participating Transmission Owner) is individually responsible for publicly posting and updating the status of its respective LSP and transmission project list on a website in a format similar to the RSP Project List.

- Northeast Utilities' project list is located at:
 - <http://www.transmission-nu.com/business/ferc890postings.asp>
 - "Local Projects List"

- The ISO-NE RSP project list links to each individual PTO's LSP projects list.

Approach to Updates

- The LSP project list is required by Attachment K to be updated at least annually.
- The Northeast Utilities LSP presentation will be made annually, at a minimum.
- Northeast Utilities may update the posted project list periodically to reflect changes in projects.

LSP Project List

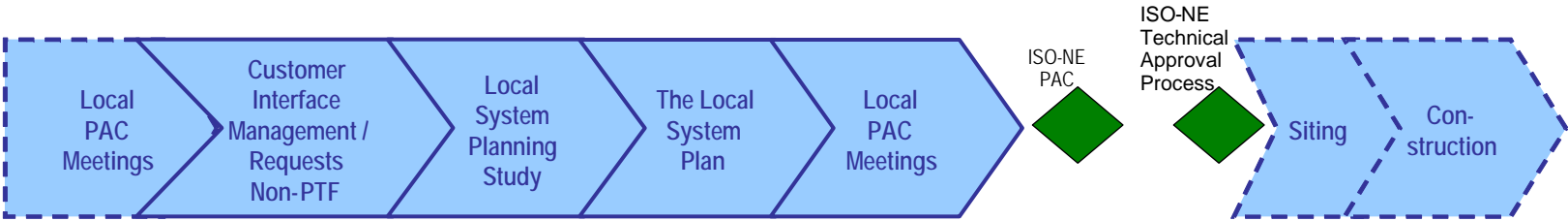
- LSP Project List is a cumulative listing of proposed regulated transmission solutions intended to meet LSP needs.
- Lower-voltage facilities contained in the LSP Project List pertain to facilities supplying our wholesale municipal customers and Distribution facilities that may connect to the PTF system.
- LSP Project List includes the status (using ISO-NE guidelines) of each non-PTF project:
 - **Concept** - Project is under consideration as possible solution to a need, but little or no analysis is available: *i.e.*, needs assessment is or will be completed
 - **Proposed** - Northeast Utilities has performed a needs analysis and has, or is, assessing other potential transmission alternatives; NU has internally determined that the project is an appropriate solution to a need, but has not yet obtained PPA (Proposed Plan Application) approval from ISO-NE (I.3.9 ISO-NE approval)
 - **Planned** - PPA has been approved by ISO-NE: *i.e.*, technical approval - the proposed preferred alternative has been tested and shown to have no adverse impact on the electrical transmission system
 - **Under Construction** - Project has PPA approval by ISO-NE
 - **In Service** - Project is complete

Local System Planning Process

- Local studies can result from:
 - Load growth
 - Area reliability assessments
 - Point of Delivery Requests from customers
 - Generator Interconnection Requests (studied in accordance with the appropriate generator interconnection procedures connecting as a Non-PTF transmission facility)
 - Other studies that may impact local facilities (*e.g.*, potential system reliability studies, market efficiency transmission upgrade, elective transmission upgrade, reliability transmission upgrade, or other studies, such as short circuit or temporary overvoltage)

- The Local System Plan
 - Summarizes the results from the needs assessment and provides criteria, data, and assumptions used in study
 - Relies on study cases
 - Determines an appropriate solution
 - Summarizes the results of the solutions study

NU Local System Planning Process



Coordination	Comparability	Develop study assumptions	Provide criteria and assumptions	Arrange stakeholder meetings	Regional Participation	Integrate with ISO-NE I.3.9 technical approval process; i.e., planned projects
Openness	Review customer requests	Identify needs and perform assessment	Develop the Local System Plan	Notify stakeholders of meetings, changes, or updates	Review the LSP after PAC RSP meeting	Cost Allocation
Transparency	Determine request requirements	Identify and select the most cost-effective preferred transmission alternative	Provide status of solutions	Review the LSP with PAC, transmission customers and other stakeholders	Include local facilities in RSP Transmission project list (as appropriate)	
Information Exchange *	Gather data/requests at meetings, as required			Communicate with customers	Review written comments from PAC	
	Respect CEII designation				Dispute Resolution	

* Non-PTF Facilities may be affected as a result of economic studies performed by ISO-NE (per Attachment K)

Criteria and Assumptions

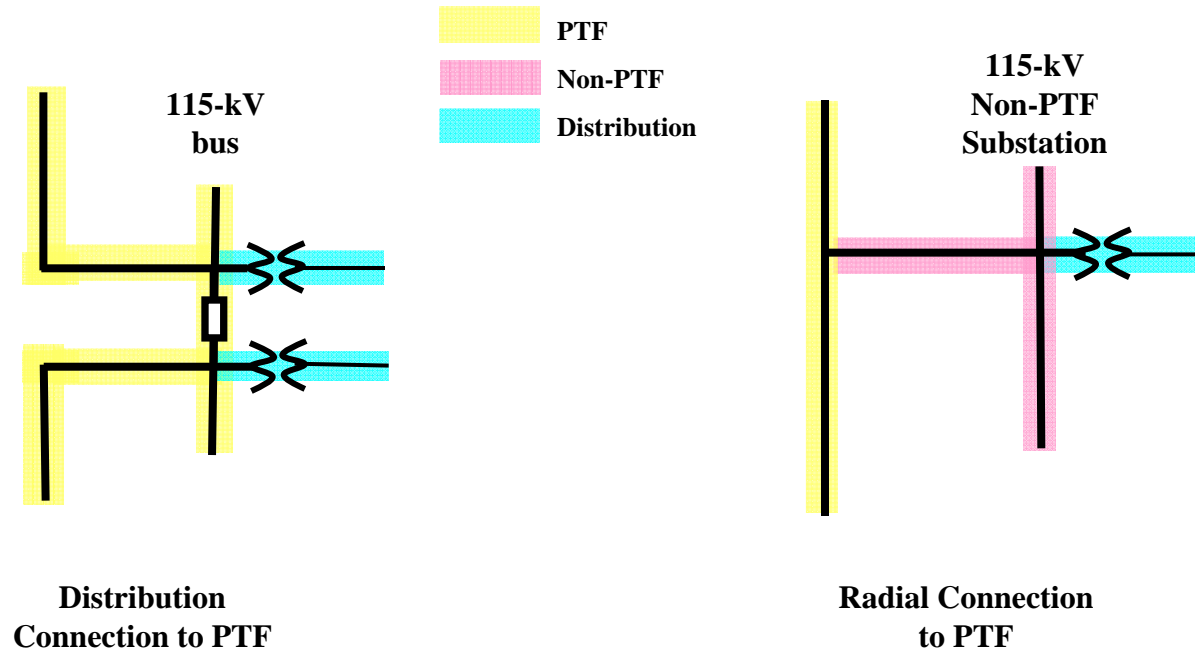
- All Northeast Utilities transmission facilities that are part of the interconnected Northeast Utilities system shall be designed in accordance with criteria described in the Northeast Utilities Transmission Reliability Guideline.
- Northeast Utilities must also comply with NERC and NPCC criteria and standards, as well as ISO-NE planning and operating procedures.

NH, MA, and CT Projects in Regional System Plan

Large-scale reliability assessments could ultimately have Local ramifications. Assessment studies are described in the RSP. Several longer-term assessments have been completed, and others are being conducted. Information about studies being conducted that may affect the local system can be found in the 2009 RSP:

- New Hampshire, RSP section 10.3.1.
- Massachusetts, RSP section 10.3.2
- Connecticut, RSP section 10.3.2.

*This Local System Plan includes the following types of
Transmission System connections
(illustrative examples)*



NU has distribution connections and radial transmission connections. Planning for Non-PTF elements may be categorized as LSP or RSP, depending on the specific project. PTF elements are included in the RSP.

Local System Plan – New Hampshire

Need	Projected In-Service Month/Year	Project Area division	Project	Current Status	Needs Assessment	Solutions
Dist/Load Growth	06/01/2011	Southern	Add two 30 MVA, 115-12.47-kV transformers at Scobie Pond Distribution substation (previously Shields Brook substation, Londonderry) *	Concept	Needed for PSNH 12.47kV system load growth.	New substation will be supplied by existing Transmission lines. New 12.47-kV infrastructure upgrades will allow local load growth and reliability of service.
Dist/Load Growth	06/01/2011	Southern	Install one 44.8 MVA, 115-34.5 kV transformer at new Thornton substation (Merrimack) *	Concept	Needed for PSNH 34.5kV system load growth.	The new substation will be supplied by looping in and out with 115-kV Line K165. This provides the needed distribution transformation for the Merrimack area and to offload an overloaded substation.
Dist/Load Growth	06/01/2012	Western	Replace the 20 MVA, 115-34.5 kV transformer with a 44.8 MVA, 115-34.5 kV transformer at Pemigewasset substation	Concept	Needed for PSNH 34.5kV system load growth.	Straight change-out of a smaller transformer to a larger capacity transformer to supply local load growth.
Dist/Load Growth	06/01/2012	Seacoast	Add a second 44.8 MVA, 115-34.5 kV transformer and second 115-kV line at Kingston substation (Kingston)	Concept	Needed for UES 34.5kV system load growth and PSNH design criteria.	The new substation will be supplied by looping a Transmission line in and out. Added transformer capacity needed for local system load and reliability of service.
Dist/Load Growth	06/01/2014	Southern	Install two 44.8 MVA, 115-34.5 kV transformers at new Broad Street substation (Nashua)	Concept	Needed for PSNH 34.5kV system load growth and PSNH design criteria.	This meets the need to provide new 115-34.5 kV capacity near the load in the greater Nashua area.
Dist/Load Growth	06/01/2014	Southern	Add a second 44.8 MVA, 115-34.5 kV transformer at Rimmon substation (Manchester)	Concept	Needed for 34.5 kV system load growth and PSNH design criteria	The substation addition will involve extending a Transmission line and looping in and out of the substation. Additional capacity is needed to serve local area load and for system operational contingencies.
Dist/Load Growth	06/01/2014	Western	Install one 44.8 MVA, 115-12.47 kV transformer at new substation (North Keene)	Concept	Needed for PSNH 12.47kV system load growth in the Keene area.	This project will provide local area transformer capacity and load contingency flexibility.

* Distribution believes these projects are fairly firm and will be progressing through the evaluation process, but the in-service dates may be subject to change.

Local System Plan – Massachusetts

Need	Projected In-Service Month/Year	Project Area	Project	Current Status	Needs Assessment	Solutions
Dist/Load growth	2011-2013	Springfield	Southwick substation *	Concept	Distribution load growth	Replace both transformers, currently rated 115-13.8 kV, 27MVA, with larger transformers to accommodate load growth.

* Distribution believes this project is fairly firm and will be progressing through the evaluation process, but the in-service dates may be subject to change.

Local System Plan – Connecticut

Need	Projected In-Service Month/Year	Project Area	Project	Current Status	Needs Assessment	Solutions
Dist/Load Growth	Apr-10	Norwalk Stamford	Add a 2nd 115/13.2kV transformer at Cos Cob substation	Planned	Additional 13.2 kV capacity required because load is near capacity of the one existing 25 MVA transformer	Adding a used, 30MVA 13.2 kV transformer was the chosen solution. This will raise the station rating to 40 MVA. Main alternative considered was to add a new 47 MVA xf and switchgear. Less expensive solution chosen because it will meet projected load growth for at least 10 years. Also, additional feeders won't be needed until load exceeds the new station rating.
Dist/Load Growth	May-10	Eastern	Install a new 115-kV Waterford (formally Cohanzie) Substation	Under Construction	The problem is at Flanders substation where the load has exceeded the station rating.	Chosen solution is a new substation with two 60 MVA transformers and 8 feeders. Two alternatives were considered. 1. Replace 47MVA transformers at Flanders with 60 MVA units. This was rejected because the new rating would still be exceeded by 2016. 2. Install a third 47 MVA unit at Flanders. This was rejected primarily due to lack of space in the Flanders yard.
Dist/Load Growth	Dec-10	Eastern	Replace one 115/34.5kV transformer and add two 115/13.8kV transformers at Mystic substation	Under Construction	Two transformer problems at Mystic substation. The 13.8-kV transformer capacity near rating and 1X transformer is gassing. Also, the 13.8-kV switchgear needs replacement.	Chosen solution is to add two 13.8 kV transformers (one new and one used), replace the 1X with a used transformer, and install new 13.8kV switchgear. No other practical solutions exist to solve the multiple problems.
Dist/Load Growth	Dec-11	Southwest	Add a 4th 115/13.2kV transformer at South End substation *	Concept	Distribution Load Growth	Add a fourth 115/13.2-kV transformer at South End Substation (Stamford).

* Distribution believes this project is fairly firm and will be progressing through the evaluation process, but the in-service dates may be subject to change.

Foreseeing Potential Problems

- Maintain a rolling perspective
- Consider up to a ten-year planning horizon for potential changes and new projects

The following pages illustrate future potential analysis: system problems that have been identified for improvement.

Future Potential Analysis: New Hampshire

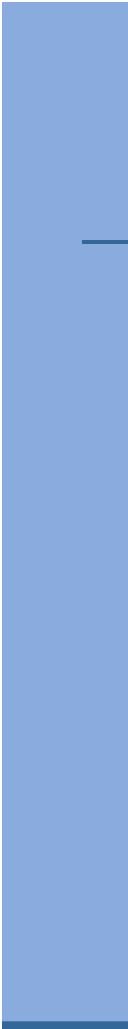
- Install one 115/34.5kV - 44.8MVA transformer at new Massabesic substation (Candia Road; Manchester)
- Install one 115/34.5kV - 44.8MVA transformer at new distribution substation (Town of Deerfield)
- Install one 115/34.5kV - 44.8MVA transformer at new Broken Ground substation (Concord: a Unitil Electric System project)
- Install one 115/34.5kV- 44.8MVA transformer at new substation (Town of Tuftonboro)

Future Potential Analysis: Massachusetts

- Potential wind farm development could require upgrades at several substations in the Berkshires including Berkshire 18C, Partridge 15E, or Plainfield 18K. No definitive solution has been chosen as many of the potential wind farms are in the early conceptual stages.

Future Potential Analysis: Connecticut

- Replace three existing 47MVA transformers with 60MVA transformers at South End substation (Stamford)
- Add a transformer and 115-kV circuit breaker at Canal 15Q substation (Cheshire)



Please provide any written comments for consideration by November 20, 2009 (as defined in the ISO-NE Open Access Transmission Tariff Section II – Attachment K Appendix 1 [Attachment K – Local], section 1.4).

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Thank You.

Questions?