

**Northeast
Utilities System**

LOCAL SYSTEM PLAN - 2011

Needs Assessment/Potential Solutions

Presented at the ISO-NE Local System Plan Meeting November 17, 2011

Update to NU LSP Presented October 21, 2010

- The NU (Northeast Utilities) LSP (Local System Plan) has been revised to incorporate the latest proposed changes to the NU Local transmission system.
- The LSP Project List is a cumulative listing of proposed regulated transmission solutions intended to meet local needs.
- This LSP-2011, supersedes NU's LSP-2010.

Purpose of Local System Plan

Per Attachment K – Local, the LSP:

- Describes projected improvements to non-PTF (Pool Transmission Facilities) that are needed to maintain system reliability
- Reflects:
 - Local Needs Assessments
 - Corresponding transmission system plans and future studies
- Identifies:
 - Local Planning Process
 - Criteria, Data, and Assumptions used in the Local System Planning Process

LSP Communication

- ISO-NE posts the materials on the PAC web page 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 their website in a format similar to the ISO-NE Regional System Plan Project List.

- Northeast Utilities' project list is located at:
 - <http://www.transmission-nu.com/business/ferc890postings.asp>
 - Scroll down to “Local Projects List” (under “Schedule 21”)

- 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 the ISO-NE Open Access Transmission Tariff, Attachment K - Local to be updated at least annually.
- The Northeast Utilities LSP presentation is made annually, at a minimum.
- Northeast Utilities may update the posted project list periodically to reflect changes in projects.

Local System Planning Process

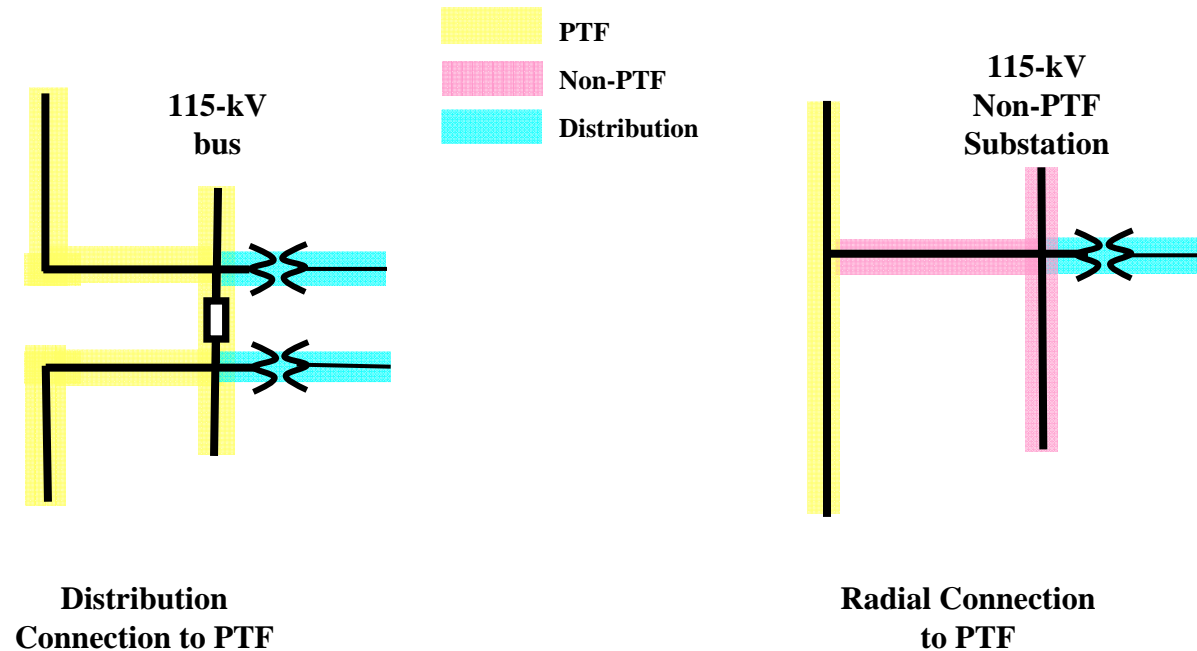
- Local studies can result from:
 - Load growth
 - Area reliability assessments
 - Point of Delivery Requests from customers
 - Other efforts that may impact local facilities (e.g., potential system reliability studies, market efficiency transmission upgrades, elective transmission upgrades, reliability transmission upgrades, or other system 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 Non-PTF solution to the identified need
 - Summarizes the results of the solutions study

Criteria and Assumptions

- All Northeast Utilities local transmission facilities are part of the interconnected Northeast Utilities system and shall be designed in accordance with criteria described in the Northeast Utilities Transmission Reliability Guideline.
- Northeast Utilities complies with NERC, NPCC, and ISO-NE planning criteria.

*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: *i.e.*, an LSP project may contain both regional and local facilities.

PTF elements are included in the RSP.

NH, MA, and CT Projects in Regional System Plan

Large-scale reliability assessments may ultimately have Local ramifications. Assessment studies are described in the ISO-NE 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 ISO-NE 2011 RSP:

- New Hampshire, RSP section 7.5.1
- Massachusetts, RSP section 7.5.2
- Connecticut, RSP section 7.5.2

LSP Project List

- The LSP Project List is a cumulative listing of proposed regulated transmission solutions intended to meet local needs.
- The 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** – A needs analysis has been performed and an assessment of other potential transmission alternatives is or has been assessed. A determination that the project is an appropriate solution to a need has been made, but has not yet obtained PPA (Proposed Plan Application) approval from ISO-NE (I.3.9 ISO-NE approval)
 - **Planned** - A Transmission Upgrade that has been approved by the ISO under Section I.3.9 of the Tariff (approved PPA)
 - **Under Construction** - A Transmission Upgrade that has received the approvals required under the Tariff and engineering and/or construction is underway
 - **In Service** - Project is complete

Local System Plan – New Hampshire: PSNH

Status of project descriptors in blue have changed from previous LSP or are newly listed

Northeast Utilities Local Area Transmission Facilities Project Listing - NH						
Need	Projected In-Service	Project Area division	Project	Current Status	Needs Assessment	Solutions
Dist/Load Growth	Dec-11	Southern	Add two Distribution transformers at new Scobie Pond distribution substation (previously Shields Brook substation, Londonderry)	Under Construction	Needed for PSNH 12.47-kV system load growth.	New distribution substation will be supplied by existing Transmission lines. Infrastructure upgrades will allow local load growth and reliability of service.
Dist/Load Growth	Jun-12	Southern	Install one transformer at new Thornton distribution substation (Merrimack)	Under Construction	Needed for PSNH 34.5-kV system load growth.	The new substation will be supplied by looping in and out with 115-kV line, providing the needed distribution transformation for the Merrimack area and to offload an overloaded substation. Part of this project is PTF and is listed in the Oct ISO-NE RSP project listing (1182).
Dist/Load Growth	2014	Seacoast	Rochester Area Project (Rochester)	Planned	The Dover/Rochester area has projected load growth. (Part of Deerfield Autotransformer project)	Build a new 6.9 mile radial 115-kV line from Rochester/Eastport to new North Rochester Distribution Substation, and install a single transformer. Part of this project is PTF and is listed in the ISO-NE RSP project listing (1141).
Dist/Load Growth	2014	Seacoast	Install a new 115/12.47-kV transformer at a new distribution substation in the Portsmouth area	Concept	Needed for PSNH 12.47-kV load growth	The new Distribution substation will be supplied by existing Transmission lines. Distribution infrastructure upgrades will serve local load growth and provide reliability of service.
Reliability/ Load Growth	2016	Seacoast	Build a new 115/34.5-kV substation in the Deerfield Area (Deerfield)	Concept	Existing distribution load substations are projected to approach their respective rating limitations. Project also provides operational and reliability benefits.	Build a new radial 115-kV line from Deerfield substation to a new 115/34.5-kV distribution substation in the Deerfield area and install a single transformer to serve local area load.
Dist/Load Growth	2016	Southern	Build a new 115/34.5-kV Massabesic substation (Manchester)	Concept	Existing distribution load substations are projected to approach their respective rating limitations. Project also provides operational and reliability benefits.	Build a new 115-kV line from Huse Rd. or Pine Hill substation to a new 115/34.5-kV Massabesic substation and install a single transformer to serve local area load
Dist/Load Growth	2017	Southern	Build a new Broken Ground Substation (Concord)	Concept	Existing distribution load substations are projected to approach their respective rating limitations.	This a Unitil Electric System project; PSNH is only involved with the offloading of PSNH's Garvins and Oak Hill substations.

Local System Plan – Massachusetts: WMECo

Status of project descriptors in blue have changed from previous LSP or are newly listed

Northeast Utilities Local Area Transmission Facilities Project Listing - MA						
Need	Projected In-Service	Project Area	Project	Current Status	Needs Assessment	Solutions
Reliability/ Load growth	Oct-11	Springfield	Southwick Substation transformer (Southwick)	In Service	This substation has experienced an increase in load. Southwick is unique in WMECo in that it supplies distribution load at both 13.8-kV and 23-kV, through two 13.8-kV transformers connected to the 115-kV system, and one 13.8/23-kV transformer. Existing 13.8-kV load levels on the distribution circuits frequently result in poor performance. Added transformer capacity is needed for local system load and reliability of service.	Replace both 13.8-kV transformers with larger capacity transformer.
Reliability/ Load growth	2013	Springfield	Southwick Substation transformer (Southwick)	Planned		Converting to the higher voltage (23kv) will increase the capacity of the circuits by nearly 60%, improving reliability.
Reliability/ Obsolescence	2014	Greenfield	Montague Substation Rebuild	Concept	Existing 13.8-kV breakers and bus at Montague substation are obsolete. Existing bus is open air, susceptible to wildlife outages.	Replace existing 13.8-kV breakers and bus with new metalclad switchgear, double bus. This will be resistant to wildlife outages and allows for breaker maintenance without taking the circuit out of service, and provides redundancy if there is a bus outage.
Reliability/ Load growth	2016	Hadley	Amherst Substation expansion or new substation (Amherst)	Concept	Upgrades are necessary in the Hadley area to accommodate load increases at UMASS-Amherst.	Add a third 115/13.8-kV transformer and associated breakers dedicated for UMASS at Amherst 17K. An alternative solution under consideration is installing a new customer owned and operated 115/13.8-kV substation adjacent to the UMASS campus.
Distribution/ Load growth	2016	Hadley	Podick Substation (Amherst)	Concept	Load growth at UMass will exceed the ratings of the 115-kV lines feeding Podick in the near term	Install 115-kV bus tie breaker between the transformers
Reliability	2015	Springfield	West Springfield Substation asset replacement	Concept	Deterioration of substation asset conditions	Evaluation on-going
Reliability	2017	Hadley	Podick Substation rebuild (Amherst)	Concept	Existing 13.8-kV breakers and bus at Podick substation are obsolete. Existing bus is open air, susceptible to wildlife outages.	Replace existing 13.8-kV breakers and bus with new metalclad switchgear, double bus. This will be resistant to wildlife outages and allows for breaker maintenance without taking the circuit out of service, and provides redundancy if there is a bus outage.

Local System Plan – Connecticut: CL&P

Status of project descriptors in blue have changed from previous LSP or are newly listed

Northeast Utilities Local Area Transmission Facilities Projects - CT						
Need	Projected In-Service	Project Area	Project	Current Status	Needs Assessment	Solutions
Dist/Load Growth	Dec-10	Eastern	Replace one 115/34.5kV transformer and add two 115/13.8kV transformers at Mystic substation (Stonington)	In-Service	Two transformer problems at Mystic substation. The 13.8-kV transformer capacity near rating and transformer is gassing.	Chosen solution is to add two 13.8-kV transformers.
Dist/Load Growth	Jun-11	Norwalk/Stamford	Add a 2nd 115/13.2-kV transformer at Cos Cob substation (Greenwich)	In-Service	Additional 13.2-kV capacity required because load is near capacity of the one existing 25-MVA transformer	Adding a used transformer to increase the rating of the station was the chosen solution. Main alternative considered was to add a new transformer and switchgear. The less expensive solution chosen because it will meet projected load growth for at least 10 years.
Reliability/Load growth	Dec-11	Greater Hartford	Black Rock Substation transformer (New Britain)	Under Construction	Due to the single source supply, obtaining adequate outages is very difficult. The equipment is very old (the transformer is greater than 60 years old) and needs to be replaced. The transformer is experiencing minor leaks and the condition is manageable until the equipment can be replaced.	The transformer shall be replaced with a 115/69-kV transformer (identical to the system spare stored at Torrington Terminal to ensure system interchangeability).
Dist/Load Growth	2012	Southwest Connecticut	Add a 3rd 115/13.2-kV transformer at Newtown substation (Newtown)	Concept	Due to area load the substation capacity approaches its limit	Adding a third transformer to increase the capacity of the substation.
Dist Load Growth	2014	Norwalk/Stamford	Add a 3rd 115/13.2-kV transformer (60-MVA) at Norwalk substation. (Norwalk)	Concept	Due to area load the substation capacity approaches its limit	Adding a third transformer to increase the capacity of the substation.

Local System Plan – Connecticut: CL&P (continued)

Status of project descriptors in blue have changed from previous LSP or are newly listed

Northeast Utilities Local Area Transmission Facilities Projects - CT						
Need	Projected In-Service	Project Area	Project	Current Status	Needs Assessment	Solutions
Dist/Load Growth	2015	Eastern	Replace two 25-MVA transformers with 47-MVA units at Uncasville substation. (Montville)	Concept	Due to area load the substation capacity approaches its limit	Replacing the two existing 25-MVA transformers with larger capacity transformers will increase the capacity of the substation to accommodate increased load growth. It will also free up the two 25-MVA units for use elsewhere on the system.
Dist Load Growth	2015	Greater Hartford	Add 3rd 115/23-kV transformer at North Bloomfield substation (Bloomfield)	Concept	Due to area load the substation capacity approaches its limit	Add a third transformer to increase the capacity of the substation.
Load growth	2015	Southwest	Canal substation, add 115/23-kV transformer (Southington)	Concept	Due to area load the substation capacity approaches its limit	Add a second bulk power transformer of 60 MVA, potential 115-kV circuit breaker, and a PCE (power control enclosure) to the Canal substation.
Reliability/ Load growth	2017	Southwest	New Greenwich Substation	Concept	Due to area load growth, a bulk substation and two distribution stations are approaching their limits. The new substation will be in the center of the load area, which will improve the reliability of the 27.6-kV and 13.2-kV distribution systems.	Add a new bulk power substation in the Greenwich area.

Future Studies: Identifying Reliability Concerns

- Maintain a rolling perspective on Non-PTF projects, updating annually
- Consider up to a ten-year planning horizon for potential changes and new projects

The following pages illustrate future analysis: system problems that have been identified for possible improvement within the ten-year period.

Future Studies: New Hampshire

- Distribution load growth may require replacing White Lake transformer with a larger transformer.
- Distribution load growth may require a larger transformer at Webster Substation.
- Distribution load growth may require a second transformer at Portsmouth Substation.
- Distribution load growth may require a second transformer to at South Milford Substation.
- Distribution load growth may require a new Broad Street Substation and associated transformer(s)
- Distribution load growth may require a second transformer at Rimmon Substation
- Distribution load growth may require a larger transformer at Pemigewasset Substation

Future Studies: Massachusetts: WMECo

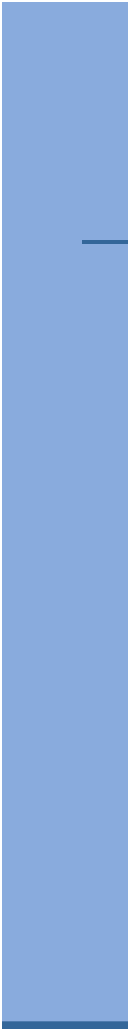
Currently there are no local projects on the long-term planning horizon.

Note: Chicopee Electric Light Department's new Memorial Drive substation, was presented at PAC on September 21, 2011 and will be a PTF facility.

Future Studies: Connecticut

- Distribution load growth may require Transmission be extended into Judd Brook (a new bulk substation)
- Distribution load growth may require Transmission be extended into northern Torrington (Burrville) (a new bulk substation)

Note: Third Taxing District and South Norwalk Electric & Water are evaluating new distribution substations interconnecting into CL&P transmission facilities.



Please provide any written comments for consideration by December 16, 2011 (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?