Regional System Plan

Transmission Projects and Asset Condition

March 2017 Update

Planning Advisory Committee Meeting

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SENIOR ENGINEER, TRANSMISSION PLANNING

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Highlights of the Project List Update

- Major cost estimate changes that occurred between the October 2016 and March 2017 project list:

  (CT) **SWCT**– 3 Projects cancelled. ISO-NE identified in the 2025 Update Report that these projects are no longer needed and are cancelled. (Total cancelled cost $37.8 M)
  Project 1569 – Loop the 1990 line in and out of Bunker Hill Substation ($0.3M)
  Project 1571 – Rebuild Bunker Hill to a nine breaker substation in breaker and a half configuration ($35.5M)
  Project 1579 – Separate 3827-1610 DCT ($2.0M)

  (MA) **Pittsfield/Greenfield** – Project cost decreased (cost reduction $20.3M)
  Project 1221 - Modify Northfield Mountain 16R substation and install a 345/115 kV autotransformer (reduction $19.5M). Cost change reflects removal of non-PTF costs which had been previously included.

  (MA) **Greater Boston – Central**
  Project 1352 – Add second Mystic 345/115 kV autotransformer and Mystic bus reconfiguration (reduction $12.8M). Cost change reflects reduced scope of work by using an innovative design to reconfigure the station.
  Added - **Project 1738 Greater Boston – Stability** - Chelsea Station #488 BPS Upgrade. Project added after System Impact Study (SIS) determined the Chelsea Station needed to be built to BPS standards. (increase cost $7.5M)

- **Other Projects**

  (MA) **New Project 1739** – **Seafood Way -** The Seafood Way project has been added to the project listing in the March 2017 update since the project is a part of the PTF prior to all components of the GB suite of projects coming into service. The project was previously excluded from past updates under the assumption that the GB projects would precede the Seafood Way substation, and with all the GB projects in place the Seafood Way substation is not a part of the PTF. However, portions of the Seafood Way substation are currently in-service and are a part of the existing PTF system and hence needs to be tracked on the RSP Project listing. This project was presented to PAC in September 2014 and is considered to be grandfathered prior to the May 18, 2015 FERC Order 1000 implementation date.

Highlights

- 27 New Projects:
  (MA)(RI) Southeast Massachusetts/Rhode Island Reliability Project – 25 projects added to Project List ($305.8M)
  (MA) Greater Boston Stability Project ($7.5M)
  (MA) Seafood Way Substation ($60.0M)

- 24 Upgrades on the project list have been placed in-service since the October 2016 update:

(CT) SWCT- 5 projects in-service
(CT) GHCC- 2 projects in-service
(MA)(NH) Greater Boston – 4 projects in-service (MA) 3 projects and (NH) 1 project
(MA) Blair Pond Substation
(MA) Tewksbury 22A GIS Substation rebuild
(MA) Central/Western MA upgrades – 1 project in-service
(MA) Pittsfield/Greenfield – 1 project in-service
(NH) Southern NH Solution – 2 projects in-service
(NH) 2 LSP projects – North Keene Substation and Rimmon Substation projects
(VT) Connecticut River Valley – 1 project in-service

March 2017 Changes

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1714	New Grand Army 115 kV GIS switching station, remote terminal station work & loop E-183E, F-184, X3 and W4 lines (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	43.8	Resolve thermal overloads
1715	Upgrades at Brayton Point (new 115 kV breaker, new 345/115 kV transformer and upgrades to E183E, F184 station equipment) (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	13.1	Resolve thermal overloads
1716	Increase clearances on E-183E & F-184 lines between Brayton Point & Grand Army (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	3.4	Increase thermal overload capability on E-183 and F-184 lines
1717	Separate X3/W4 DCT and reconductor X3, W4 lines between Somerset and Grand Army Reconfigure Y2 and Z1 (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	14.6	Required to increase thermal overload capability on X3 and W4
1718	Robinson Ave 115 kV circuit breaker addition and re-terminate Q10 line (Rhode Island) Southeast Massachusetts/Rhode Island Reliability Project	2.0	Required to avoid loss of station due to breaker-failure

March 2017 Changes, *cont.*

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1719	Install 45.0 MVAR capacitor bank at Berry Street (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	1.6	Resolves voltage violations
1720	Separate N12/M13 DCT & reconductor N12 & M13 between Somerset and Bell Rock (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	39.0	Resolve thermal overloads and avoid voltage collapse
1721	Reconfigure Bell Rock to breaker and a half station, split M13 line at Bell Rock and terminate 114 line at Bell Rock. Install new breaker in series with N12/D21 tie breaker, upgrade D21 line switch and install 37.5 MVAR capacitor. (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	18.9	Resolve thermal overloads and avoid voltage collapse
1722	Extend 114 line - Dartmouth town line (Eversource- NGRID border) to Bell Rock (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	12.3	Resolve thermal overloads and avoid voltage collapse
1723	Reconductor L14 and M13 from Bell Rock to Bates Tap (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	29.2	Resolve thermal overloads

March 2017 Changes, *cont.*

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1724	Kent County T3 345/115 kV transformer replacement (Rhode Island) Southeast Massachusetts/Rhode Island Reliability Project	8.1	Resolve thermal overloads
1725	Build a new Bourne #917 to West Barnstable #921 115 kV line and associated terminal work (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	36.0	Resolve thermal overloads and avoid voltage collapse
1726	Separate the 135/122 DCT lines - West Barnstable to Barnstable (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	7.4	Resolve thermal overloads and avoid voltage collapse
1727	Retire Barnstable SPS (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	0.2	Barnstable SPS is not required after separating DCT 122/135 and installing a new line from Bourne to West Barnstable
1728	Build a new Carver to Kingston #735 115 kV line and Carver terminal (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	19.6	Resolve thermal overloads

March 2017 Changes, *cont.*

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1729	Install a new bay position at Kingston #735 for Carver line (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	2.7	Required to terminate new line from Carver to Kingston that resolves thermal overloads
1730	Extend the 115 kV 114 line from Eversource/National Grid border to Industrial Park Tap (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	16.2	Resolve thermal overloads and avoid voltage collapse
1731	Install 35.3 MVAR 115 kV capacitors at High Hill Substation #644 and Wing Lane Substation #624 (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	2.9	Resolve voltage violations
1732	Loop 201-502 line into Medway #65 Substation to form the 201-502N and 201-502S lines (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	7.8	Resolve thermal overloads and voltage violations
1733	Separate the 325/344 DCT lines - West Medway to West Walpole (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	17.9	Resolve thermal overloads

March 2017 Changes, *cont.*

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1734	Reconductor/Upgrade 112 Line from Tremont Substation #713 to Industrial Tap and terminal equipment (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	4.8	Resolve thermal overloads
1735	Replace wave trap on 114 line at Tremont Substation #713 (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	0.2	Resolve thermal overloads
1736	Reconductor the 108 line from Bourne Substation #917 to Horse Pond Tap (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	0.9	Resolve thermal overloads
1737	Replace disconnect switches 107A, 107B, 108A and 108B on Line 323 at West Medway Substation #446 (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	0.2	Resolve thermal overloads
1738	Chelsea Station #488 BPS Upgrade (Massachusetts) Greater Boston - Stability	7.5	"Meet NPCC BPS standards"

March 2017 Changes, *cont.*

27 New Projects and Corresponding Need

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1741	Rebuild the Middleborough Gas and Electric (MGED) portion of the E1 line from Bridgewater to Middleborough (2.5 miles) (Massachusetts) Southeast Massachusetts/Rhode Island Reliability Project	2.9	Resolve thermal overloads
1739	Build a new 115kV Substation - Seafood Way (Massachusetts)	60.0	Addition of new substation to address area load growth

March 2017 Changes, *cont.*
24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1605	Separation of 115 kV DCT corresponding to the Middletown – Pratt and Whitney line (1572) and the Middletown to Haddam (1620) line (Connecticut) GHCC	0.9	Increase load serving capability in the Middletown area
1585	Upgrade terminal equipment on the 115 kV line between Chippen Hill and Lake Avenue Junction (1810-3). Reconductor the 115 kV line between Southington and Lake Avenue Junction (1810-1) – 5.2 miles (Connecticut) GHCC	9.0	Increase load serving capability in the Northwest Connecticut area
1668	Rebuild 115 kV lines 447-508 and 447-509 from the Eversource tap in Sharon to Dean St. #496 substation in Norwood (Massachusetts)	8.5	Resolve thermal overloads
1393	Add two 115 kV breakers to Mashpee Station to support double-ending station (Massachusetts)	7.7	Increase system reliability in Lower SEMA area
1395	Tewksbury 22A 345 kV GIS Substation rebuild (Massachusetts)	45.4	Resolves asset condition issues and improves reliability and flexibility for expansion

March 2017 Changes, *cont.*
24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1384	Milvon to Devon Tie 88005A - 89005B 115 kV Line Upgrade (Connecticut) SWCT	30.9	Resolve thermal overloads
1386	Mix Avenue 115 kV Capacitor Bank Additions, Series Reactor Addition and Terminal Modifications (Connecticut) SWCT	21.7	Resolve voltage violations under contingency conditions
1385	Sackett 115 kV PAR Removal - Terminal Modifications (Connecticut) SWCT	1.3	Resolve thermal overloads and address reliability concerns due to multiple maintenance issues
1383	North Haven to Walrec 1630-3 115 kV relay upgrade (formerly known as North Haven to Walrec 1630-3 line & relay upgrade) (Connecticut) SWCT	0.4	Resolve thermal overloads
1575	Reconductor the 1575 Line (Bunker Hill – Baldwin Junction; 3.0 miles) (Connecticut) SWCT	2.5	Increase load serving capability in SWCT area

March 2017 Changes, *cont.*
24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1207	Build a new 115 kV Substation – Blair Pond (Massachusetts) Blair Pond Substation Project	70.7	Increase load serving capability to Belmont
1519	Relocate Chelsea capacitor bank to thw 128-518 termination position (Massachusetts) Greater Boston – Central	1.3	Address voltage concerns
1212	115 kV Line Reconductoring of M-139 between Tewksbury-Billerica Tap and associated work at Tewksbury (Massachusetts) Greater Boston – North	Part of Project RSP 1549 20.0	Resolve thermal overloads
1640	Reconductor the Eversource portion of the M-139/211-503 and N-140/211-504 115 kV lines between Pinehurst – North Woburn tap (Massachusetts) Greater Boston – North	4.7	Resolve thermal overloads
1364	Reconductor Eversource's portion of Y-151 between Hudson and Power Street (New Hampshire) Greater Boston – North	3.3	Resolve thermal overloads

March 2017 Changes, *cont.*

24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1225	Rebuild the Cumberland to Montague 1361/1242 115 kV double circuit line and terminal work at Cumberland and Montague. At Montague substation, reconnect Y177 115 kV line into 3T/4T position, and perform other associated substation work (Massachusetts) Pittsfield/Greenfield Project	Part of Project RSP ID 1221 94.0	Address reliability concerns in Western MA area
955	Refurbish and reconductor (W175) West Charlton - Little Rest - Palmer w/1590 ACSR (Massachusetts) Central/Western Massachusetts Upgrades Group 4 E. Longmeadow Projects	28.0	Resolve thermal overloads
1660	Replace four of the existing transformers at Keene substation with one 115/12.47 kV 30 MVA transformer. Construct a N. Keene Substation, loop in the L163 line with two 115 kV breakers, install one 115/12.47 kV 30 MVA transformer (New Hampshire) LSP North Keene Substation Project	10.0	Increase load serving capability in the Keene Area

March 2017 Changes, *cont.*

24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1661	Rebuild Rimmon substation and add three 115 kV breakers, install a 2nd 115/34.5 kV transformer and two 115 kV 13.3 MVAR capacitors, connect the Rimmon substation to the J114 line; install a series 115 kV breaker at Greggs substation (New Hampshire) LSP Rimmon Substation Project	12.5	Increase load serving capability in the Rimmon Area
1503	Install in-line breaker at Mount Support Substation and loop the 115 kV W-149N line. Relay work at Wilder and Slayton Hill for the pilot protection system. (New Hampshire)	8.5	Increase load serving capability and area reliability in the Connecticut River Corridor Area
1301	Eagle Substation Add: 345kV yard, (3) 345 kV circuit breakers, (4) 115kV circuit breakers, (1) 345/115 kV auto-transformer, (4) 26.6 MVAR 115 kV capacitor banks (New Hampshire) Southern New Hampshire Solution	32.3	Increase load serving capability and area reliability in the Southern New Hampshire area
1270	New 115 kV line from Fitzwilliam to Monadnock and associated substation work (New Hampshire) Western New Hampshire Solution	19.5	Increase load serving capability and area reliability in the Southern New Hampshire area

March 2017 Changes, *cont.*

24 Projects Placed In-Service and Corresponding Needs

Project ID #	Transmission System Upgrades	Cost (in millions $)	Improvement/Need
1616	Split Hartford 25 MVAR capacitor bank into two 12.5 MVAR banks (Vermont) Connecticut River Valley	4.0	Resolve low voltage violations at Hartford
1491	Reconductoring of J16 (Riverside - Highland Dr.) (Rhode Island) New Highland Park Substation Project	5.6	Increase thermal capability to support new substation that is needed to increase load serving capability in Rhode Island

March 2017 Changes, *cont.*

Cost Estimate Comparisons of Reliability Projects October 2016 vs. March 2017 Update [1]

	As of Oct 2016 Plan Update (in millions $)	As of Mar 2017 Plan update (in millions $)	Change in Plan Estimate (in millions $)
MAJOR PROJECTS			
Maine Power Reliability Program (MPRP)	1459	1459	0
Greater Hartford & Central Connecticut (GHCC)	346	337	-9
New England East - West Solution (NEEWS)	1581	1581	0
NEEWS (Greater Springfield Reliability Project) $676.0			
NEEWS (Rhode Island Reliability Project) $362.3			
NEEWS (Interstate Reliability Project) $482.3			
NEEWS $59.6			
Southeast Massachusetts/Rhode Island Reliability Project		306	306
Pittsfield/Greenfield Project	212	192	-20
Greater Boston - North, South, Central, Western Suburbs	843	836	-7
New Hampshire Solution - Southern, Central, Seacoast, Northern	328	328	0
Vermont Solution - Southeastern, Connecticut River	111	111	0
Southwest Connecticut (SWCT)	450	415	-35
SUBTOTAL [2]	**5330**	**5565**	**235**
OTHER PROJECTS	6761	6754	-7
NEW PROJECTS		60	60
PROJECTS WHOSE COST ESTIMATES WERE PREVIOUSLY REPORTED AS TO BE DETERMINED (TBD)			
TOTAL [2]	**12091**	**12379**	**288**
Minus 'concept'			
Minus 'in-service'	-8024	-8353	
Aggregate estimate of active projects in the Plan [2]	**4067**	**4027**	

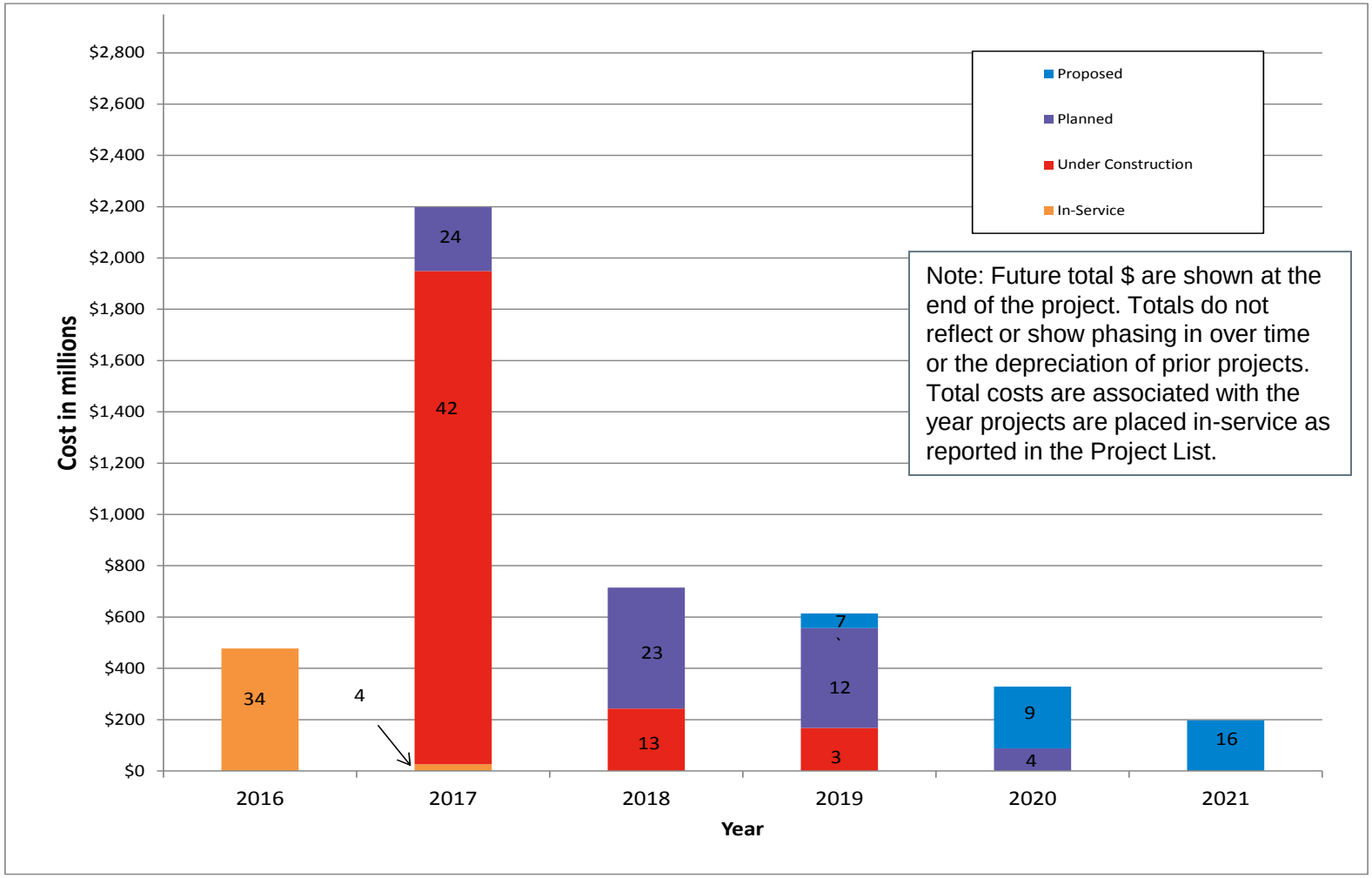
[1] Transmission Owners provided all estimated costs, which may not meet the guidelines described in Planning Procedure 4, Attachment D

[2] May not sum exactly due to rounding

[3] The cost estimates for projects in the "Major Projects" category are moved to the "Other Projects" category once they are fully completed.

March 2017 Changes, *cont.*

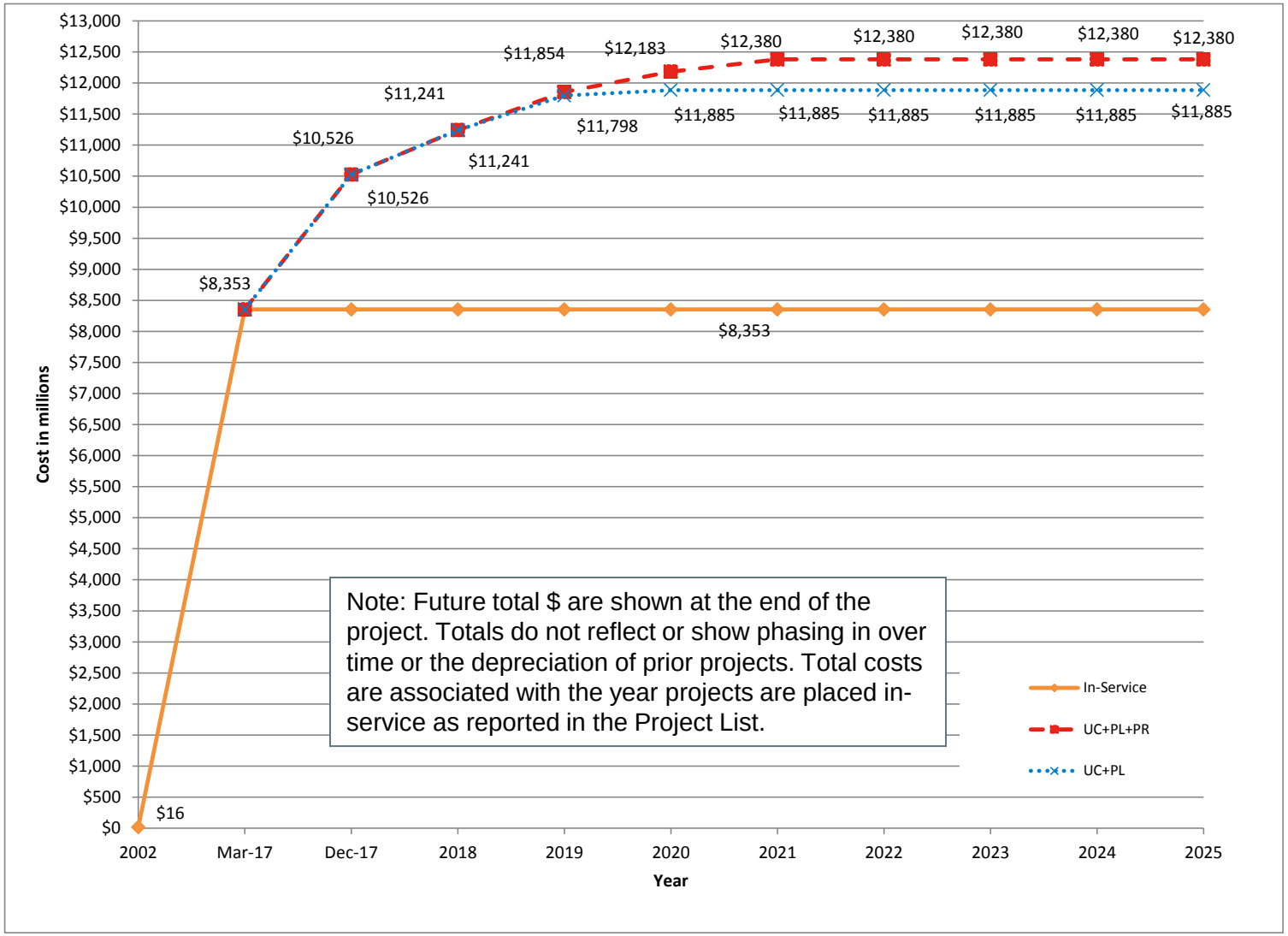
Investment of New England Transmission Reliability Projects by Status through 2021



Note: Numbers shown represent project quantities

March 2017 Changes, *cont.*

Cumulative Investment of New England Transmission Reliability Projects through 2025



Note: UC – Under Construction, PL – Planned, PR – Proposed

March 2017 Changes, *cont.*

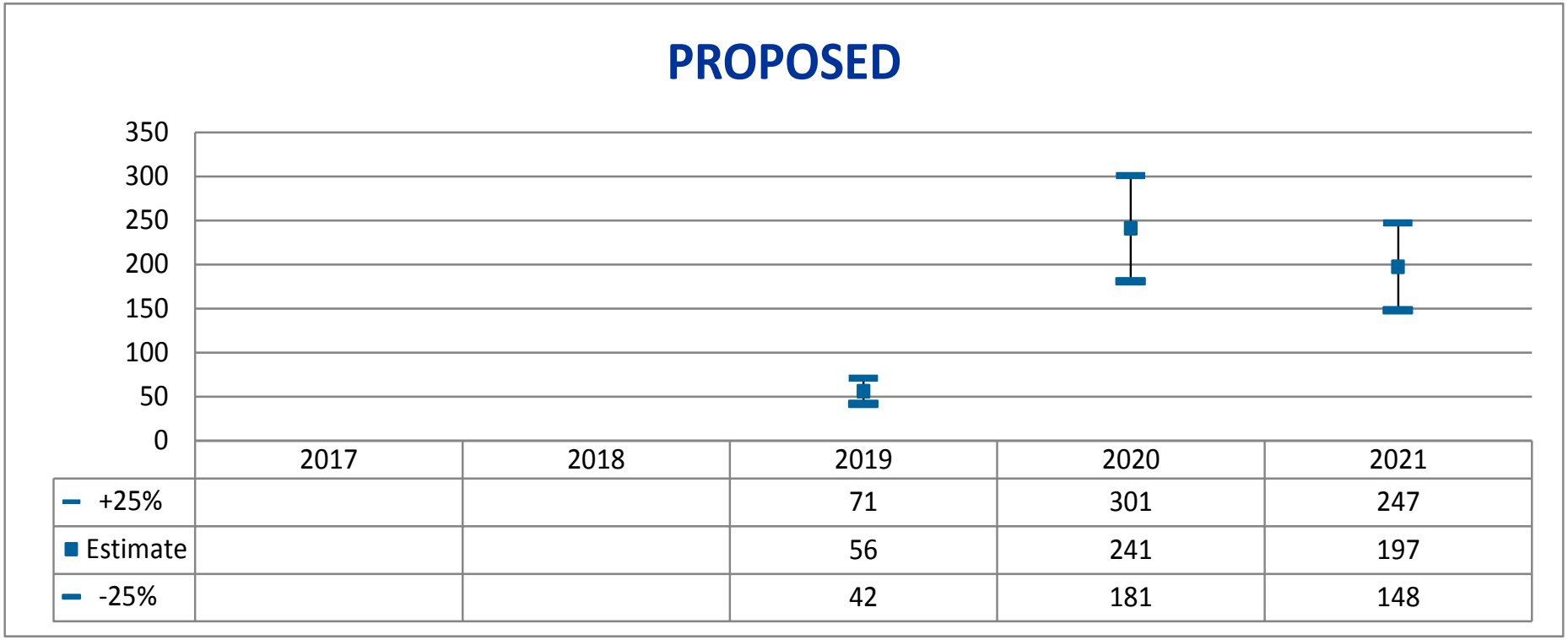
Reliability Project Counts and Aggregated Cost Estimates by Project Stage with Applied Accuracy Ranges (1)

Project Stage (Status)	Component / Project / Plan Count (2)	Estimate Range Minimum	Estimate Range Maximum	Estimated Costs ($millions)	Range Minimum ($millions)	Range Maximum ($millions)
Proposed	32	-25%	25% (3)	495	371	619
Planned	63	-25%	25%	1199	899	1499
Under Construction	58	-10%	10%	2333	2100	2566
Total Plan (excluding Concept)	**153**			(5) **4027**	**3370**	**4684**
Concept	0			(4) 0		
In-Service	24	-10%	10%	329	296	362
Cancelled	3			38		

(1) All costs provided by Transmission Owners. The costs in the table reflect all projected in-service dates
(2) Efforts need to be made to describe projects on a more consistent basis
(3) All estimates may not yet be at this level of accuracy; many estimates may be -25%/+50%
(4) Not included here are the costs of reliability projects for which no estimates have been provided. **Estimates for these projects are noted as TBD in the Project Listing and are only Concept Projects.**
(5) May not add up due to rounding.

March 2017 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $

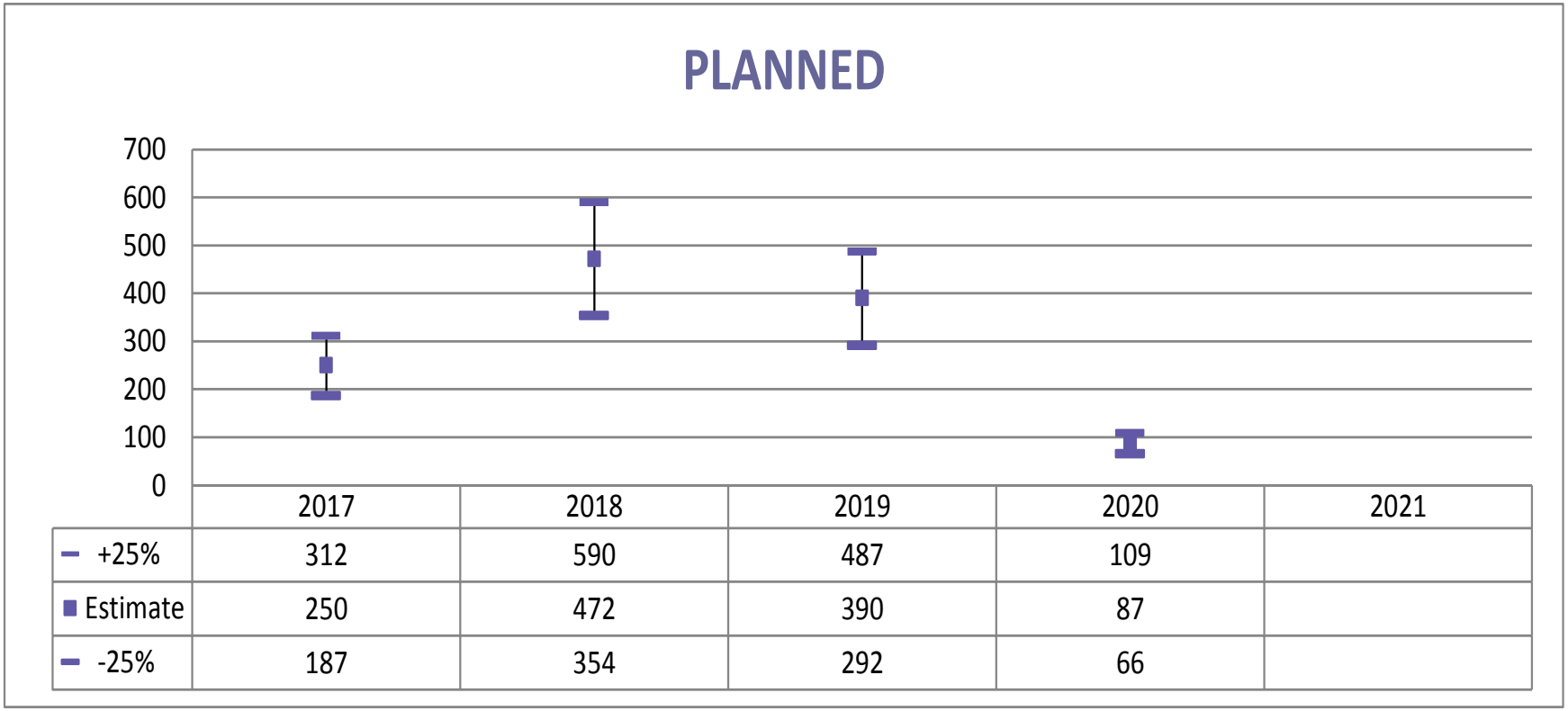


	2017	2018	2019	2020	2021
+25%			71	301	247
Estimate			56	241	197
-25%			42	181	148

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

March 2017 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $

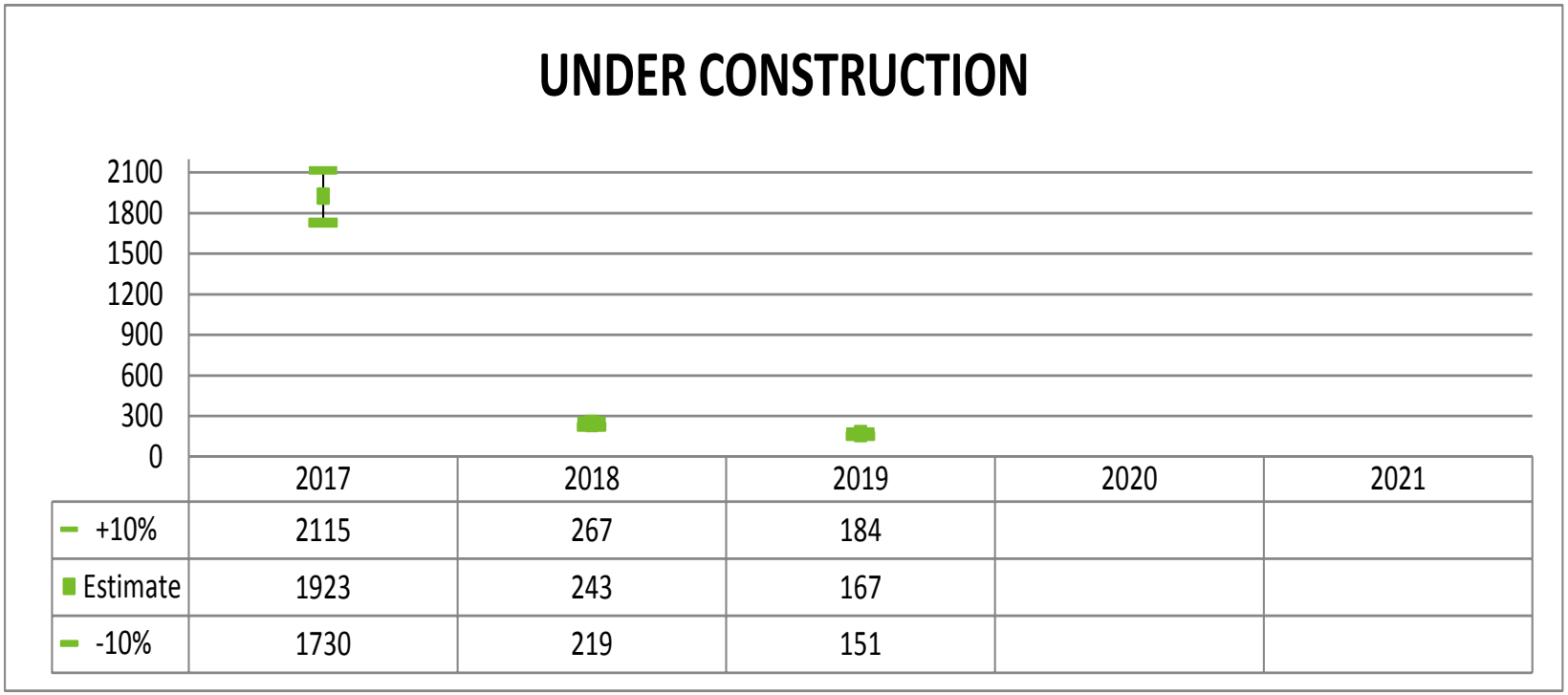


	2017	2018	2019	2020	2021
+25%	312	590	487	109	
Estimate	250	472	390	87	
-25%	187	354	292	66	

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

March 2017 Changes, *cont.*

Project Cost Estimate Tolerances by Status and Year in Millions $



	2017	2018	2019	2020	2021
+10%	2115	267	184		
Estimate	1923	243	167		
-10%	1730	219	151		

Note: Future total $ are shown at the end of the project. Totals do not reflect or show phasing in over time or the depreciation of prior projects. Total costs are associated with the year projects are placed in-service as reported in the Project List.

Status of Major Transmission Projects

	PPA	TCA	Construction
Pittsfield/Greenfield Project	Approved 12/12, 01/16, 05/16	Partial 2/11/16	Project completion 2014-2019
Maine Power Reliability Program (MPRP)	Approved 7/08, 2/09, 11/10	Approved 1/29/10	Project completion 2014-2018
Vermont Solution – Connecticut River Valley	Approved 4/15	TCA Submitted	Project completion 2016-2018
Southwest Connecticut (SWCT)	Approved 4/15	Partial 7/16/15, 4/15/16, 5/13/2016	Project completion 2013-2020
Southeast MA/RI Reliability	Not Submitted	Not Submitted	Project completion 2019-2021

Status of Major Transmission Projects, *cont.*

	PPA	TCA	Construction
Central/Western MA Reinforcements	Approved 12/07, 3/11	Group 1 2/29/2012	Project completion 2009-2019
Greater Boston – North, South, Central and Suburbs	Approved 4/15, 5/15, 6/16	Not Submitted	Project completion 2013-2019
New Hampshire Solution – Western, Central, Southern and Seacoast	3/13	Seacoast 11/5/15 Southern 1/7/16 Western 12/17/15 Central 11/25/15	Project completion 2013-2020
Greater Hartford & Central Connecticut (GHCC)	4/15	TCA Submitted	Project completion 2015-2018

March 2017 Asset Condition
14 New Projects

Project ID #	Transmission System Upgrades	Cost (in millions $)
18	East Shore - Raising Impacted 115 kV Equipment (Connecticut) UI Coastal Substation Flood Mitigation Study Project	0.3
19	Congress 115 kV Substation Flood Wall (Connecticut) UI Coastal Substation Flood Mitigation Study Project	14.8
20	Grand Avenue - Mill River 115 kV Substation Flood Wall (Connecticut) UI Coastal Substation Flood Mitigation Study Project	16.6
21	Singer 345kV Substation Flood Wall (Connecticut) UI Coastal Substation Flood Mitigation Study Project	11.6
22	Pequonnock 115kV Substation rebuild with a new substation adjacent to the existing one (Connecticut) UI Coastal Substation Flood Mitigation Study Project	128.2

March 2017 Asset Condition, *cont.*
14 New Projects

Project ID #	Transmission System Upgrades	Cost (in millions $)
23	Section 388 & 3023 Structure Replacement (Maine)	101.6
24	Section 396 & 3001 Structure Replacement (Maine)	16.9
25	Cleary 115 kV ring bus asset replacement - replace existing ring bus with new 115 kV switching station on an adjacent site and reconnect lines and transformers (Massachusetts)	4.7
26	Rebuild Bourne Substation as a breaker and one half scheme (Massachusetts)	37.0
27	Kingston Substation #735 Asset Condition Replacement (Massachusetts)	6.5

March 2017 Asset Condition, *cont.*

14 New Projects

Project ID #	Transmission System Upgrades	Cost (in millions $)
28	115 kV GIS breaker replacement at Kingston Street Substation (Massachusetts)	34.5
29	1620/1975 line structure replacement (Connecticut)	15.5
30	3424 line (portion in Connecticut) asset condition and storm hardening (Connecticut)	5.9
31	345 kV GIS breaker replacements at Kingston Street #514 (Massachusetts)	22.2

March 2017 Asset Condition, *cont.*

5 Projects Placed In-Service

Project ID #	Transmission System Upgrades	Cost (in millions $)
4	Phase 1 – Remove Breaker 22, remove Bus 4 and upgrade sections of Bus 2 (New Hampshire) Seabrook 345 kV GIS removal and bus upgrade	Part of Asset Condition #5 12.0
2	Crystal Lake Substation upgrades (Massachusetts) Crystal Lake Substation	7.0
30	3424 line (portion in Connecticut) asset condition and storm hardening (Connecticut)	5.9
31	345 kV GIS breaker replacements at Kingston Street #514 (Massachusetts)	22.2
13	Ludlow-Thorndike-Palmer (WMECO portion) of the X176 115 kV line rebuild (Massachusetts)	8.9

Appendix

Summary: Project Listing Definitions

- **ISO New England Inc. Transmission, Markets and Services Tariff Section II**
  - **Attachment K, Regional System Planning Process**
    - Definition Of Needs Assessment
    - Definition of Solution Studies
  - **Project Listing Subcategories**
    - **Concept:** shall include a transmission project that is being considered by its proponent as a potential solution to meet a need identified by the ISO in a Needs Assessment or the RSP, but for which there is little or no analysis available to support the transmission project. (Project not well-defined, costs not well-defined, solution implementation not supportable).
    - **Proposed:** The project will include a regulated transmission solution that has been proposed in response to a specific Needs Assessment on the RSP and has been evaluated or further defined and developed in a Solutions Study and communicated to PAC. (Project well-defined, cost estimate quality sufficient for comparison of alternatives).
    - **Planned:** The project will include a Transmission upgrade that has been approved by the ISO, pursuant to Section I.3.9 (presumes Needs Assessment and Solutions Study have been completed). (Still subject to Schedule 12C review for Transmission Cost Allocation)

Project Listing

Project Listing Column Definitions for:

- Reliability Projects
- Interconnection Projects
- Market Efficiency Upgrades
- Elective Projects
- Merchant Projects
- Projects In-Service
- Cancelled Projects

Project Listing – Column Definitions

Part Number (Part #)

The Part #'s designate the 'need' category of the project. Original categories are not changed when a project is placed 'In-Service' or 'Cancelled".

Part 1 – These projects are Reliability Upgrades.

- 1a: Planned or Under Construction
- 1b: Conceptual or Proposed

Part 2 – These projects are Generator Interconnection Upgrades.

- 2a: Proposed (I.3.9 approval but without Generator Interconnection Agreement), Planned (I.3.9 approval with Generator Interconnection Agreement), or Under Construction
- 2b: Conceptual or Proposed

Part 3 – These projects are Market Efficiency Upgrades.

- 3a: Planned or Under Construction
- 3b: Conceptual or Proposed

Part 4,5 – These projects may be promoted by any entity electing to support the cost of transmission changes. The entity sponsoring the changes will have their own justification for their actions.

- 4,5a: Planned or Under Construction
- 4,5b: Conceptual or Proposed

Project Listing – Column Definitions, *cont.*

Project ID

This number is generated from ISO-NE System Planning Information Tracking System. It may change in the future as the tracking system evolves.

Primary Equipment Owner

The company listed here is the responsible equipment owner / provider designated to design and implement the project.

Other Equipment Owner

For projects that involve multiple Transmission Owners, the company listed here is also a responsible equipment owner / provider designated to design and implement the project.

Projected Month/Year of In-Service

The month/year entered is the date the project is expected to be placed in service.

Major Project

Name given to a project that consists of smaller subprojects.

Project / Project Component

A brief, high-level description of the project is entered here. It will either include major pieces of substation equipment and/or types of line work to be performed.

Project Listing – Column Definitions, *cont.*

Status

In Service: The project has been placed in operation.

Under Construction: The project has received necessary approvals and a significant level of engineering or construction is underway.

Planned: The project will include a Transmission upgrade that has been approved by the ISO.

Proposed: The project will include a regulated transmission solution that has been proposed in response to a specific Needs Assessment on the RSP and has been evaluated or further defined and developed in a Solutions Study and communicated to PAC.

Concept: Shall include a transmission project that is being considered by its proponent as a potential solution to meet a need identified by the ISO in a Needs Assessment or the RSP, but for which there is little or no analysis available to support the transmission project.

Cancelled: Project has been cancelled.

Project Listing – Column Definitions, *cont.*

PPA Approval (Review of Market Participant's Proposed Plans)

A date in this column signifies when the project received approval pursuant to Section I.3.9 of the ISO-New England Tariff. This approval indicates that the project will have no adverse impact on the stability, reliability, or operating characteristics of the system. A 'no' indicates that an approval is required, but has not been received yet. An 'NR' indicates that an I.3.9 approval is not required.

TCA Approval (Transmission Cost Allocation)

A date in this column signifies when the project PTF costs were reviewed and approved. This approval indicates that it has been agreed whether, and by how much, the scope of the project and associated costs exceed regional needs. An 'NR' indicates that a TCA approval is not applicable either because the project has been cancelled or no/very minimal PTF costs are involved.

Estimated Costs

The pool-supported project cost estimate presented here should be the best estimate available. It is understood that the estimate accuracy may vary dependent on the maturity of the project.

Accuracy tolerances for these estimates are targeted as follows:

Concept Project

Proposed Project that has been reviewed and approved to proceed by ISO-NE (+/-25%),

I.3.9-Approved Project (+/-25%), and

TCA-Approved Project (+/-10%)