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Operations Project Authorization Form

Approved on September 1, 2021 EPAC

Link to Meeting Minutes

Date Prepared: 08/26/2021	**Project Title: [redacted] – Add OP-18 Metering**
Company: Eversource CT	**Project Number: CS00473**
Organization: Protection & Controls Engineering	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Other**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Project Purpose: Add OP-18 compliant metering for generator**
Estimated in service date: 12/01/2021	**Capital Investment part of original Oper. Plan: No**
Eng./Constr. Resources Budgeted? Yes	**O&M Expenses part of original Oper. Plan: No**
Authorization Type: Full Funding	**Facility Type (check all that apply):**
Total Request: $445K (100% Reimbursable)	**☐ PTF ☐ non-PTF ☒ Distribution**

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

Eversource is the Lead Market Participant (MP) for Rainbow Dam Hydroelectric Facility. [redacted] Per Independent System Operator - New England (ISO-NE) Operating Procedure (OP)-14, as Lead MP, Eversource is responsible for ensuring this hydroelectric facility meets the Metering and Telemetering criteria, which are found in ISO-NE OP-18.

Rainbow Unit 1 and Rainbow Unit 2, owned by The Stanley Works, located in Windsor, CT, each have a maximum output of 4.1 MW but as they connect to a common collector, they are no longer grandfathered under OP-14. [redacted] See Attachment B for the station nomenclature diagram. [redacted]

An initial funding request for $75K for this project was approved in PowerPlan on March 17, 2021. As of August 24, 2021 approximately $28K has been used for preliminary engineering

and constructability walkdowns. The total costs of this project are fully reimbursable through Special Contractual Obligations established by Eversource Distribution Rates.

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Project Costs Summary

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	2022	2023	2024	2025	Total
1. ROW / Easements / Land Acquisition	$	$	$	$	$	$	$	$
2. Environmental Approvals / Permits	$	$	$	$	$	$	$	$
3. Outreach	$	$	$	$	$	$	$	$
4. Siting Approvals / Permits	$	$	$	$	$	$	$	$
5. Engineering / Design	$	$	$21	$7	$	$	$	$28
6. Materials (Eversource purchased)	$	$	$46	$	$	$	$	$46
7. Construction (incl matl's by contractors)	$	$	$95	$	$	$	$	$95
8. Testing / Commissioning	$	$	$34	$9	$	$	$	$42
9. Project Mgmt Team	$	$	$21	$3	$	$	$	$25
10. Removals	$	$	$	$	$	$	$	$
11. Other	$	$	$	$	$	$	$	$
12. Risks	$	$	$22	$5	$	$	$	$27
SUBTOTAL DIRECTS W/ RISKS	**$75**	**$**	**$239**	**$24**	**$**	**$**	**$**	**$263**
13. Indirects/Overhead	$	$	$144	$19	$	$	$	$163
14. AFUDC	$	$	$7	$	$	$	$	$7
PROJECT TOTAL – BASELINE BUDGET	**$75**	**$**	**$390**	**$43**	**$**	**$**	**$**	**$433**
15. Contingency	$	$	$12	$	$	$	$	$12
TOTAL CAPITAL REQUEST	**$75**	**$**	**$402**	**$43**	**$**	**$**	**$**	**$445**
16. Reimbursables/Customer Contribution	$	$	$-402	-$43	$	$	$	$-445
PROJECT TOTAL (LESS REIMBURSABLES)	**$75**	**$**	**$402**	**$43**	**$**	**$**	**$**	**$445**
O&M	$	$	$	$	$	$	$	$
TOTAL REQUEST	**$75**	**$**	**$402**	**$43**	**$**	**$**	**$**	**$445**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

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Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	2022	2023	2024	2025	Total
ST Labor	$	$	$16	$4	$	$	$	$21
OT Labor	$	$	$	$	$	$	$	$
Outside Services Labor	$	$	$151	$14	$	$	$	$166
Materials*	$	$	$47	$	$	$	$	$47
Removals	$	$	$	$	$	$	$	$
Other	$	$	$36	$5	$	$	$	$41
Indirects	$	$	$144	$19	$	$	$	$163
AFUDC	$	$	$7	$	$	$	$	$7
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$75**	**$**	**$402**	**$43**	**$**	**$**	**$**	**$445**

*All materials including Eversource purchased and outside service purchased. Note that outside service purchased material included in construction in project cost summary above.

Future Financial Impacts:

Provide below the estimated future costs that will result from the project: N/A
Note: Dollar values are in thousands

Future Costs	Year 20__	Year 20__	Year 20__	Year 20__+	Total Future Project Costs
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Describe the estimated future Capital, O&M, and/or Other costs noted above:

What functional area(s) will these future costs be funded in?_____N/A_____
A representative from the respective functional area is required to be included as a project approver.

Provide below the estimated future financial benefits that will result from the project: N/A
Note: Dollar values are in thousands

Future Benefits	Year 20__	Year 20__	Year 20__	Year 20__+	Total Future Project Benefits
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Describe the estimated future Capital, O&M, and/or Other benefits noted above:

What functional area(s) will these benefits be reflected in?____N/A_____
A representative from the respective functional area is required to be included as a project approver.

Asset Retirement Obligation (ARO) and/ or Environmental Cleanup Costs (Environmental Liabilities):

Is there an ARO associated with this project? No

Are there other environmental cleanup costs associated with this project? No

Technical Justification:

Project Need Statement

During an Independent System Operator - New England (ISO-NE) review of registration and performance data, the Rainbow Dam Hydroelectric Facility Rainbow Hydro Units 1 and 2 were identified as assets greater than 5MW at a common collector. [redacted]. See Attachment B for the nomenclature diagram.

[redacted]

Project Objectives

[redacted]

The project is expected to be fully reimbursable by the operator of the facility.

Project Scope

- [redacted]
- [redacted]
- [redacted]

A constructability review was performed on 08/20/2021. See Attachment C for the completed form.

Background / Justification

Revisions to ISO – NE OP-14 that eliminated grandfathering provisions for SORs greater than 5 MW became effective on April 1, 2019. As a result, under the currently-effective provisions of

OP-14, all generators participating in the New England Markets that are 5 MW or greater at a common collector must be registered as generators and meet all associated offer, telemetry, and dispatchability requirements.

Business Process and / or Technical Improvements

[redacted]

Alternatives Considered with Cost Estimates

[redacted]

Do nothing – [redacted]

Project Schedule

Milestone/Phase Name	Estimated Date
Preliminary Site Walkdown	02/05/2021 - Completed
Conceptual Engineering Scope	02/19/2021 - Completed
Approval to proceed by facility operator	4/30/2021
Preliminary Engineering Completion	6/30/2021
Full Funding request at EPAC	09/01/202
IFC Engineering Completion	09/03/2021
Construction Start	10/1/2021
ISD	12/01/2021

See Attachment D for the P6 schedule.

Regulatory Approvals

None required.

Risks and Risk Mitigation Plans

There is a risk of not meeting the compliance date mandated by ISO-NE.

Contingency

Contingency of $12K is included in the estimate for unidentified risks that do not currently have mitigation plans.

References

ISO-NE Operating Procedure 14, “Technical Requirements for Generators, Demand Response Resources, Asset Related Demands and Alternative Technology Regulation Resources.”

ISO-NE Operating Procedure 18, “Metering and Telemetering Criteria.”

CS00473-[redacted]-Add OP-18 Metering Initial Funding Request, dated 3/3/2021

Attachments (One-Line Diagrams, Images, etc.)

Attachment A – Backup Cost Estimate

Attachment B - [redacted] Nomenclature Diagram (26401-91001.pdf)

Attachment C - Constructability Review Form

Attachment D - P6 schedule

Attachment E - Rainbow Hydro Summary and Checklist_20210709 (1)

INSTRUCTIONS:
It is the responsibility of the initiator to contact the subject matter experts in the listed area disciplines to determine if the project considerations contained in this list are applicable to their project. They should fill out the checklist and determine a transition plan for the purpose of project execution. See the PAF Guide for additional instruction.

Project Checklist - Transmission & Substation Capital Project						
Project Name: [redacted] **OP-18 Metering Upgrades**				**Project Number: CS00473**		
Facility Type: ☐ BPS ☐ BES ☐ PTF ☒ non-PTF ☐ CIP ☒ Distribution						
PLANNING						
Is a NX-9 required?				No		
Is an ISO-NE PAC presentation required?				No		
ISO-NE Presentation Date (if completed):				Enter Date		
Cost in ISO-NE Presentation ($M) (if completed):				Enter Cost ($M)		
Is a PPA required?				No		
Is a TCA Application Required?				No		
TCA Submittal Date (if submitted):				Enter Date		
Cost in TCA Submittal ($M) (if submitted):				Enter Cost ($M)		
Enter ISO-NE RSP / Asset Condition ID, if assigned:				Enter ISO-NE ID		
PLANNING/PROTECTION & CONTROLS						
Are RAS/SPS/UVLs affected?				No		
OPERATIONS						
Outage Required?	☐ Primary Equipment (Power Transfer)	☒ Secondary Equipment (P&C only)	☐ Outage Not Required			
Do SCLL Conditions Exist?				No		
Has an outage schedule been approved?				No		
Are Operations & Maintenance procedures/training required?				No		
STANDARDS						
Does the project include standard equipment and designs?				Yes		
SUBSTATION ENGINEERING						
Does this impact Revenue Metering				Yes		
Is preliminary short circuit/ breaker duty analysis required?				No		
Are there any changes to the baseline audible noise?				No		
Is there an impact to the existing ground grid?				No		
Is a Transient Over Voltage (TOV) analysis required?				No		

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] OP-18 Metering Upgrades	**Project Number: CS00473**

P&C ENGINEERING	
OP-22 - Are PMUs and DDR required?	No
If BPS, is an NPCC Directory #4 presentation required?	No
Are ISO-NE OP-24 Appendix B updates necessary?	No
TRANSMISSION LINE ENGINEERING	
Are there any changes that affect the baseline EMF?	No
Are there any changes that affect the baseline EMI?	No
SITING	
Is a Siting filing required? *(If yes, list in regulatory approvals section)*	No
PERMITTING	
Is there any permitting required? *(If yes, list in regulatory approvals section)*	No
SITING & CONSTRUCTION SERVICES (OUTREACH)	
What is the level of outreach expected?	None
INITIATOR	
Has a field constructability review been completed?	Yes
INVESTMENT RECOVERY	
Does the project require development of an Investment Recovery plan?	Choose an item
COST ESTIMATING	
What team/firm prepared the cost estimate?	Choose an item
Name of the person who prepared the estimate:	
Was the estimate reviewed by Eversource Estimating?	Choose an item

Cost Estimate Backup Details

Please see Attachment A for the detailed cost estimate backup.

ESTIMATE SUMMARY

Project Title: [redacted]
Project Mgr/Lead: [redacted]

Estimate By: [redacted]
Date of Estimate: 08/04/21

Project Number: CS00473
WO & Task #: TBD
Est. Revision # 01
Estimate Type - Station work

ISD:12/31/2021

Estimate # C-21-213 Rev 1

Template Revision # 01.61

ESTIMATE SUMMARY

Estimate Type: Conceptual

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026
1	ROW / Easements / Land purchases										
2	Environmental Approvals / Permits										
3	Outreach										
4	Siting Approvals / Permits										
5	Engineering / Design	$27,800	10.6%	6.2%		$20,700	$7,100				
6	Materials (Eversource purchased)	$45,900	17.5%	10.3%		$45,900					
7	Construction (incl matl's by	$95,000	36.1%	21.4%		$95,000					
8	Testing / Commissioning	$42,400	16.1%	9.5%		$33,800	$8,600				
9	PMT Project Mgmt Team	$24,700	9.4%	5.6%		$21,500	$3,200				
10	Removals										
11	Other										
12	Risks	$27,000	10.3%	6.1%		$22,000	$5,000				
	Project Directs Total w/Risks	**$262,800**	100.0%	59.1%		**$238,900**	**$23,900**				
13	Indirects/Overhead	$163,400		36.7%		$144,400	$19,000				
14	AFUDC	$6,900		1.6%		$6,900					
	Project Total - Baseline Budget	**$433,100**		97.3%		**$390,200**	**$42,900**				
15	Contingency	$11,800		2.7%		$11,800					
	Project Total - Funding Approval Level	**$444,900**		100.0%		**$402,000**	**$42,900**				
16	Reimbursables/Customer Contribution	-$444,900				-$402,000	-$42,900				
	Project Total (less reimbursables)	-									
	Amount of Escalation included above	$1,100					$1,100				
6	Total materials - Eversource	$45,900				$45,900					
	Total materials - Contractor	$1,300				$1,300					
	Total materials	$47,200				$47,200					
	NOTE: Risk / Contingency is 9.6% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)										
	Estimate Range	**-25%**	-		**50%**						
			-								

COMMENTS:

Project Scope:

[redacted]

Assumptions/Clarifications:
Indirect rates based on: 11 - CT . Station work

Engineering, construction and test to be completed by contractors.
Engineering review, Telecom Eng, Field Comunication, Drawing update and LCE internal.

RISKS

Potential UG Obstructions	$	8,000
Severe Weather, Delays, OT	$	4,000
Design development	$	10,000
Existing conditions	$	5,000

Project Number: CS00475
Date of Estimate: 08/04/21
Est. Revision # 01
Template Revision # 01.01

CSTXX-CONSTRUCTION	R		Prior actuals to date Mhrs	DOLLARS	2021 Mhrs	DOLLARS	1 2022 Mhrs	DOLLARS	2 2023 Mhrs	DOLLARS	3 2024 Mhrs	DOLLARS	4 2025 Mhrs	DOLLARS	5 2026 Mhrs	DOLLARS	TOTAL Mhrs	DOLLARS
Electrical Construction	LT																	
General Construction	LT																	
SCADA / Automation	LT																	
Telecom - Field	LT																	
Construction Reps (Internal)	LT																	
Support Switch/Tap	LT																	
Other (specify)	LT																	
Other (specify)	LT																	
Other (specify)	LT																	
LT Total																		
Employee Expenses	AE	5%																
Construction Purchased Material	AM	1%				$706												$706
Outside Construction Vendor	AO					$70,644												$70,644
Sales tax on Constr. Vendor																		
Vehicles (now in indirects section)	AV																	
Inspection services (Outside Vendor)	AO																	
Construction Rep (Outside vendor)	AO					$23,040												$23,040
Rents and Leases	BR																	
CSTXX Subtotal						$94,390												$94,390
Escalation						-		$ -		$ -		$ -		$ -		$ -		$ -
	P1																	
CSTXX Total						$94,390												$94,390
ENRXX-TG ENGINEERING/DESIGN																		
Project Services/Drafting	LT							$1,092										$1,092
T- Line Engineering/Design	LT					$1,080												$1,080
D- Street Engineering/Design	LT																	
Civil Engineering/Design	LT																	
Substation (T) Engineering/Design	LT																	
Substation (D) Engineering/Design	LT					$795												$795
Protection & Controls Engineering	LT					$1,590		$546										$2,136
Survey Engineering	LT																	
SCADA / Automation Engineering	LT					$2,120		$546										$2,666
Telecom Engineering	LT					$1,590		$546										$2,136
Metering	LT					$1,590		$546										$2,136
Field Communication	LT					$1,590		$546										$2,136
LT Total						$10,335		$3,822										$14,157
Employee Expenses	AE	5%				$517		$192										$709
Contractor Engineering - T-Lines	AQ																	
Contractor Engineering - D-Street	AQ					$3,775		$1,555										$5,330
Contractor Engineering - T -Station	AQ																	
Contractor Engineering - D-Station	AQ																	
Contractor Engineering - PSC	AQ					$6,120		$1,578										$7,698
Contractor Engineering - Survey	AQ																	
Contractor Engineering - SCADA / Automatic	AQ																	
Contractor Engineering - Telecom	AQ																	
Contractor Engineering - Specify	AQ																	
Contractor Engineering - Specify	AQ																	
Contractor Engineering - Specify	AQ																	
Vehicles (now in indirects section)	AV																	
ENRXX Subtotal			-			$20,747		$7,145	-		-		-		-			$27,892
Escalation																		
	P1																	
ENRXX Total			-			$20,747		$7,145	-		-		-		-			$27,892
LNDXX-TG LAND																		
Real Estate	LT																	
Employee Expenses	AE	5%																
Purchase Land	AM																	
Vehicles (now in indirects section)	AV																	
Fees and Payments	BF																	
LNDXX Subtotal			-						-		-		-		-			
Escalation																		
	P1																	
LNDXX Total			-						-		-		-		-			
MATXX-TG MATERIAL																		
Eversource	AM					$43,518												$43,518
Outside Services	AM					$1,300												$1,300
	AM																	
Freight																		
Sales Tax Eversource/outside services		4%				$1,700												$1,700
Other																		
MATXX Subtotal						$46,518												$46,518
Escalation																		
	P1																	
MATXX Total						$46,518												$46,518
PSMXX-PROJECT MANAGER & SUPPORT																		
Project Management (PM)	LT					$3,392		$437										$3,829
Project Planning/Coast (P)	LT					$848		$218										$1,066
Contracts/Purchasing (C/P)	LT					$424												$424
System Planning	LT					$848												$848
Environmental	LT																	
SCS - None	LT																	
Legal	LT																	
Estimating	LT					$636												$636
Siting - None	LT																	
Asset Management	LT																	
Other -	LT																	
Other -	LT																	
Other -	LT																	
Other -	LT																	
LT Total						$6,148		$655										$6,803
Employee Expenses	AE	5%				$307		$33										$340
Project Support Vendor - PM	AQ					$15,000		$2,472	-		-		-		-			$17,472
Project Support Vendor - P	AQ								-		-		-		-			
Project Support Vendor - C/P	AQ								-		-		-		-			
Project Support Vendor - System Planning	AQ								-		-		-		-			
Project Support Vendor - Enviromental	AQ								-		-		-		-			
Project Support Vendor - SCS - None	AQ								-		-		-		-			
Project Support Vendor - Legal	AQ								-		-		-		-			
Project Support Vendor - Estimating	AQ								-		-		-		-			
Project Support Vendor - Siting - None	AQ								-		-		-		-			
Project Support Vendor - Asset Management	AQ								-		-		-		-			
Project Support Vendor - Other	AQ								-		-		-		-			
Project Support Vendor - Other	AQ								-		-		-		-			
Project Support Vendor - Other	AQ								-		-		-		-			
Project Support Vendor - Other	AQ								-		-		-		-			
Vehicles (now in indirects section)	AV																	
Property or CWIP tax large proj. allowance	BR																	
	BR																	
Fees and Payments - Enviromental	BF																	
Fees and Payments - Siting	BF																	
Fees and Payments - Other	BF																	
PSMXX Subtotal			-			$21,455		$3,160	-		-		-		-			$24,615
Escalation																		
	P1																	
PSMXX Total			-			$21,455		$3,160	-		-		-		-			$24,615
REMXX-TG REMOVAL																		
Engineering/Design	LT																	
Internal Construction	LT																	
LT Total																		
Employee Expenses	AE	15%																
Outside Services	AO																	
Contractor Labor	AQ																	
Vehicles (now in indirects section)	AV																	
Rents and Leases	BR																	
REMXX Subtotal			-						-		-		-		-			
Escalation																		
	P1																	
REMXX Total			-						-		-		-		-			
TSTXX-TG TEST																		
Test / Field Engr. Labor (In House)	LT																	
Lead Commissioning Engr. (LCE) (internal)	AQ					$9,556												$9,556
Employee Expense	AE	10%				$989												$989
Test / Field Engr. Labor (contractor)	AQ					$22,880		$8,570										$31,450
Lead Commissioning Engr. (LCE) (contactor)	AQ																	
Vehicles (now in indirects section)	AV																	
TSTXX Subtotal						$33,757		$8,570										$42,327
Escalation																		
	P1																	
TSTXX Total						$33,757		$8,570										$42,327
SUBTOTAL PROJECT DIRECT COST			-			$216,867		$18,875	-		-		-		-			$235,742
Risk																		
Risk						$22,000		$5,000										$27,000
Risk Total						$22,000		$5,000										$27,000
TOTAL PROJECT DIRECT COST			-			$238,867		$23,875	-		-		-		-			$262,742
INDIRECTS																		
Non-Productive Time Allocation (ZB)	58	14.1%				$3,969		$674										$4,643
Payroll Benefits Allocation (ZE) Incl NPT	59	44.0%				$5,006												$5,006
Gen SVC CO Overhead (ZF) Incl NPT	60	75.0%				$14,223		$3,863										$18,086
E&S Allocations (ZI)	61	90.0%				$95,514		$11,593										$107,107
AS&E Allocations (ZJ)	62	1.5%				$4,195		$438										$4,633
Stores Expense Allocation (ZC)	62	8.0%				$3,481												$3,481
Lobby Stock																		
MDEC		5.0%				$10,617		$1,170										$11,787
Vehicles		28.0%				$7,384		$1,254										$8,638
	63																	
Indirects Subtotal						$144,389		$18,992										$163,381
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)						$383,256		$42,867										$426,123
AFUDC																		
AFUDC (ZK)						$6,913	0		0		0		0		0		0	$6,913
In Service Dollars																		
Cumulative ISS																		
AFUDC Subtotal						$6,913												$6,913
TOTAL PROJECT COST - Baseline Budget						$390,169		$42,867										$433,036
Continoecv																		
Contingency						$11,795												$11,795
Other																		
Continoecv SubTotal						$11,795												$11,795
TOTAL PROJECT COST - Approved Funding						$401,964		$42,867										$444,831
Reimbursables / Customer Contribution																		
Reimbursables / Customer Contribution (enter as negative)						-$401,964		-$42,867										-$444,831
	59																	
TOTAL PROJECT COST																		

ES VER: 05/2015

3/20/2019 9:17 AM - aldiema - \\nu.com\data\Shareddata\Adept_Drawings\PWQueBatch\1e1c44e0-01b7-41ee-ab35-c73dedfb7780\a334de9d-7402-42f4-b6dc-af8232a7dd6f\26401-91001.DWG - As Built

ES VER: 05/2015

[redacted]

3/20/2019 9:17 AM - oldiema - \\nu.com\data\Shareddata\Adept_Drawings\PWQueBatch\1e1c44e0-01b7-41ee-ab35-c73dedfb7780\a334de9d-7402-42f4-b6dc-df8232a7dd6f\26401-91001.DWG - Construction-All

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Constructability Review Form: **Substation**

Project Title: CS00473 [redacted] Add OP-18 Metering	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS00473	**Project Constructability Phase:**	
Date(s) of Constructability Review: Click to enter a date 8/220/2021	☐ Conceptual Engineering Design	
Click to enter a date	☒ Preliminary Engineering Design	
	☐ Detailed Engineering Design	

Project Scope Statement: Eversource is the Lead Market Participant (MP) for Rainbow Dam Hydroelectric Facility. Per ISO-NE OP-14, as Lead MP, Eversource is responsible for ensuring this facility meets the Metering and Telemetering criteria, which are found in ISO-NE OP-18.

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	Name
☐	X	Project Management	[redacted]	☐	x	S/S Engineering	[redacted]
☐	☐	Asset Management		☐	☐	P&C Engineering	
☐	x	Constr. Management		☐	☐	Civil Engineering	
☐	☐	S/S Technical / LCE		x	x	Telecom	
☐	☐	S/S Operations**		☐	☐	Environmental	
☐	☐	Field Engineering		☐	☐	Real Estate	
☐	☐	Line Engineering		☐	☐	T&D ROW	
☐	☐	Vegetation Management		☐	☐	Survey Engineering	
☐	☐	Siting		☐	☐	Cost Estimating	
☐	☐	Safety		☐	☐	Outreach (SCS)	
☐	☐	SCADA		☐	☐	Material Procurement	

*** Sign-off in the table above for the Detailed Engineering Design Constructability Review indicates that all Action Items/Concerns from prior Constructability Reviews have been mitigated/resolved as documented in this form. Not every department is required to attend walkdowns for every project but should be consulted for project impact considerations**

** Internal Eversource Substation Operations must be included in the review even if external construction resources are planned

[Project Manager] certifies that this review was performed to completeness, that all applicable departments were informed of the project and have had opportunity to provide input to this review:

[redacted] 8/20/2021

Name / Signature *Date*

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Constructability Review Form: **Substation**

Documents available for use prior to Constructability Review					
[X]	Document	[X]	Document	[X]	Document
☐	Initial Scope -Birdseye site plan -General Arrangement	☐	Preliminary Drawings -Civil Site Drawing -Electrical Drawing -Section Drawings	☐	Prints in hand for marking up -Panel Front/Read View -Control Enclosure Layout -Floor / Wall Plans
☐	Detailed Scope Document	☐	Proposed Schedule	☐	Construction Sequence/Timeline
☐	Previous Notes / Comments / Observations	☐	Major Material / Equipment List	☐	Replace / Reuse of equipment

Action Items and Resolutions:

Item No.	Const. Review Action Item/Concern	Design Resolution/Mitigation:
1		
2		
3		
4		
5		

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
A	**Engineering & Asset Management**		
1	**Scope of Work** - Is scope adequately developed and sufficiently detailed for intended deliverable? - Any complimentary projects or other adjacent obsolete equipment for inclusion? - Any overlapping projects that could impact work/outages? - Consider Physical Installation, P&C Scope, Civil Scope, Engineering studies, Design standard adherence - Any remote station impacts? - Engineering Estimates for Design and Technical Support? (EE and EOC) Total Project	X	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
2	**Materials Identified/Ordered** -Any concerns with BOM/Major Materials? Review BOM lead times and project need dates -Specialty Major Materials: Identify Specialty Equipment & Materials potentials - temporary/replacement - long lead items? -Any Materials needed to facilitate construction access?	☐	
3	**Control House** - Review Unmapped equipment interferences, Control/Battery Enclosure Layout, HVAC System (if equipment added), space for new or modified equipment, AC / DC station breaker availability and service loading, Panel Space, Expansion, one-line and/or riser type panelboard drawings, other..	☐	
4	**Ratings & Dimensions** for Major Equipment. Any concerns upon field review? Equipment Rating One Line (and/or equipment thermal ratings tables) - Review for any errors in field	☐	
5	**Wall, Fence, Gate, and Foundation Considerations** -Any permanent / temporary alterations or relocations required? -Pre-Project Sound Measurements Needed? Sound Walls? -Take measurements for Foundation quantities, dimensions and concrete volumes -CIP Review/Ballistic needs. Any Physical Security Requirement Consideration? -Assess condition of existing yard equipment foundations and viability for reuse (if proposed) -Review station expansion areas (if needed) for structures, old foundations, etc. -Any Steel Structural Plan Considerations? -Any impacts to construction plan?	☐	
6	**Below Grade / Enclosure Raceway** - If possible, evaluate existing raceway and review spacing requirements. Review for any subsurface investigation needs or potential below grade obstructions. GPR/test pits needed? Geotechnical Investigation - is soil boring or resistivity investigation needed?	☐	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
7	**Underground Obstructions** -Drawing review concerns? -Is preconstruction or test excavation needed? -Is reuse of underground control cables / Conduits /replace Non-Shielded Cable feasible (if applicable) -Are spare conduits available? Are they useable? -Review if any areas will need to be plated for increased load bearing for equipment access (i.e. large Xfmr, etc.)	X	
8	**Grounding Plan (Ground Grid)** - Will footprint impact layout or other equipment? Identify locations to improve grounding. Impacts to foundations and ground grid plans. Observations on wetlands or ability to perform tests	X	
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	X	
10	BPS Separation Requirements - Is this BPS Substation? Y/N (part of PAF) - Changes to pre-existing BPS standards?	X	
11	IEC 61850 Substation Automation and Communication Requirements - Any Impacts/Retrofit needed?	X	
12	Any Upgrades to ES Standards - Is retrofit needed to bring up to ES standards? Can that be done?	X	
B	**Construction**		
1	**Any safety hazards specific to the facility? i.e. Low Bus, Deterioration, etc.**	X	Energized Equipment
2	**Prior known Site Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	X	
3	**Identify/Consider Required Depts for Construction?** -Who is constructor: Internal vs External Resources -S/S Ops, GO, Test, Field Engineering, etc	X	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
	-Specialty Contractors Required? -Required Oversite Needed - Estimated level of CR and LCE support needed		CR support 1-2 weeks LCE support 2-3 days
4	**Site Plan, Access, and Temporary Construction Facilities:** -Confirm maintenance access for proposed new or replaced equipment -Verify clear footprint for yard equipment / Property Plan -General access to site, can areas outside substation be utilized? -Substation Entry Plan (driveway and drive path modifications) - Identification of Unique Requirements, i.e. (access bridges, station service, etc.) -Site Development Plan (grading and drainage) with Cut/Fill -Existing Rock Conditions? Potential Impacts (rock quantity)? -Any police details needed for deliveries, restricted hours, and/or need for extended hour approvals -Any Sanitary Civil Requirements? (Septic tanks, etc) -Review turning radius for delivery trucks (if critical) -Any Substation Access and site/yard access Limitations? -Office Trailer Needs: Facilities, Utilities, Restroom, Container, Dumpster Space -Weather impacts to Site (Snow Placement) -Identify Material Laydown and Security -Where will new vs removed equipment go? -Construction permit for trailers outside substation fence?	X	
5	Unique Equipment Considerations: Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser	X	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
6	**Outage & Energization Plan and Construction Sequence:** *Review electrical working clearances for equipment during construction, Detailed look at protection zone changes, Locked sequence or random outages, Outage durations minimized.* ***Considerations:*** -Approach Distances – Outage Requirements to maintain electrical clearances throughout proposed installation -Distribution Clearances -Clearance Holder Assignments -Drawings vs Field Conditions -Outage boundaries and interconnections -Phased approach needs for additional mobilizations -Verify outage sequence supports the planned construction sequence and timeline. (Lead Commissioning Engineer "LCE", Substation Operations, and Outage Planner input) -Any design alterations or considerations to Eliminate SCLL Conditions, Reduce Recall Time, Reduce Outage durations, Special Conditions -Additional outage requirements: Railroad Catenaries, Fiber outage, SCADA outage, Relay permissions -Seasonal or weather conditions impacts	X	Outages will need to be coordinated with Stanley Black & Decker
7	**Equipment Testing & Acceptance** -Grounding plans / Resources? Will we need grounds hung? -Hi-pot testing and where will the equipment be set up?	X	
8	Need for mobile generator and where connected (if needed)	X	
9	Need for mobile battery and where connected (if needed)	X	
10	OT work required or Notable Permit Conditions (special hours)?	X	Possible need to support work off hours to not infringe on generator
11	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	☐	Coordinate boundaries in cabinet with Stanley Black & Decker

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
C	**Environmental**		
1	Soil Pre-Characterization or Grab Sampling Completed/Planned	X	
2	**Desktop investigation and EAD Review** -Required Permits -Stormwater Considerations -Dewatering requirements -Wetland and buffer review	X	
3	Risk or presence of PCB's/Asbestos/Lead/SF6	X	
4	Transformer Spill Containment Recommended?	X	
5	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)	X	
6	Environmental oversight considerations? (Inspection type/Interval)	X	
7	Environmental mitigations - Any matting or seasonal needs? Review D&M Plan with CR.	X	
D	**Siting, S&CS, and T&D Real Estate**		
1	**Any regulatory concerns or approvals needed?** - Consider scope/design alterations to mitigate concerns - Consider Visual screening considerations (feasibility or location) -Zoning Relief and Permits required	X	
2	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?	X	
3	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	X	
4	Installation within Eversource Rights - Is Rights and Restrictions Review required?	X	
5	Expanding Footprint / New Buildings or future Expansion Plans?	X	
6	Proposed Equipment on same property? - Any Encroachments	X	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	☐	
2	Space on existing panels for new equipment? (front & rear of panel fronts)	X	
3	Panel fronts conform to drawings	☐	
4	Access to bring new panels into control enclosure	☐	
5	Nameplate list and location of nameplates	X	
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	X	
7	Temporary protection, relays, control cable needed? How long will they be required?	X	
8	Will relay setting changes be needed? Any additional outage requirements for changes?	X	
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	X	
2	Review path to get telecom circuits into the station and paths within the control house. Determine whether new underground duct or overhead tray work is needed.	☐	[redacted]
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.	X	
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.	X	
5	Review and list any remote station impacts/updates	☐	[redacted]
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination	N/A	
7	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed	X	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
8	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	☐	[redacted]
9	Review third party Telecommunications at substation and confirm whether additional capacity or Ground Potential Rise protection is required	☐	

Photos

(Ex. Equipment control cabinet, Breakers, MODs, CCVTs, PTs, Transformers)



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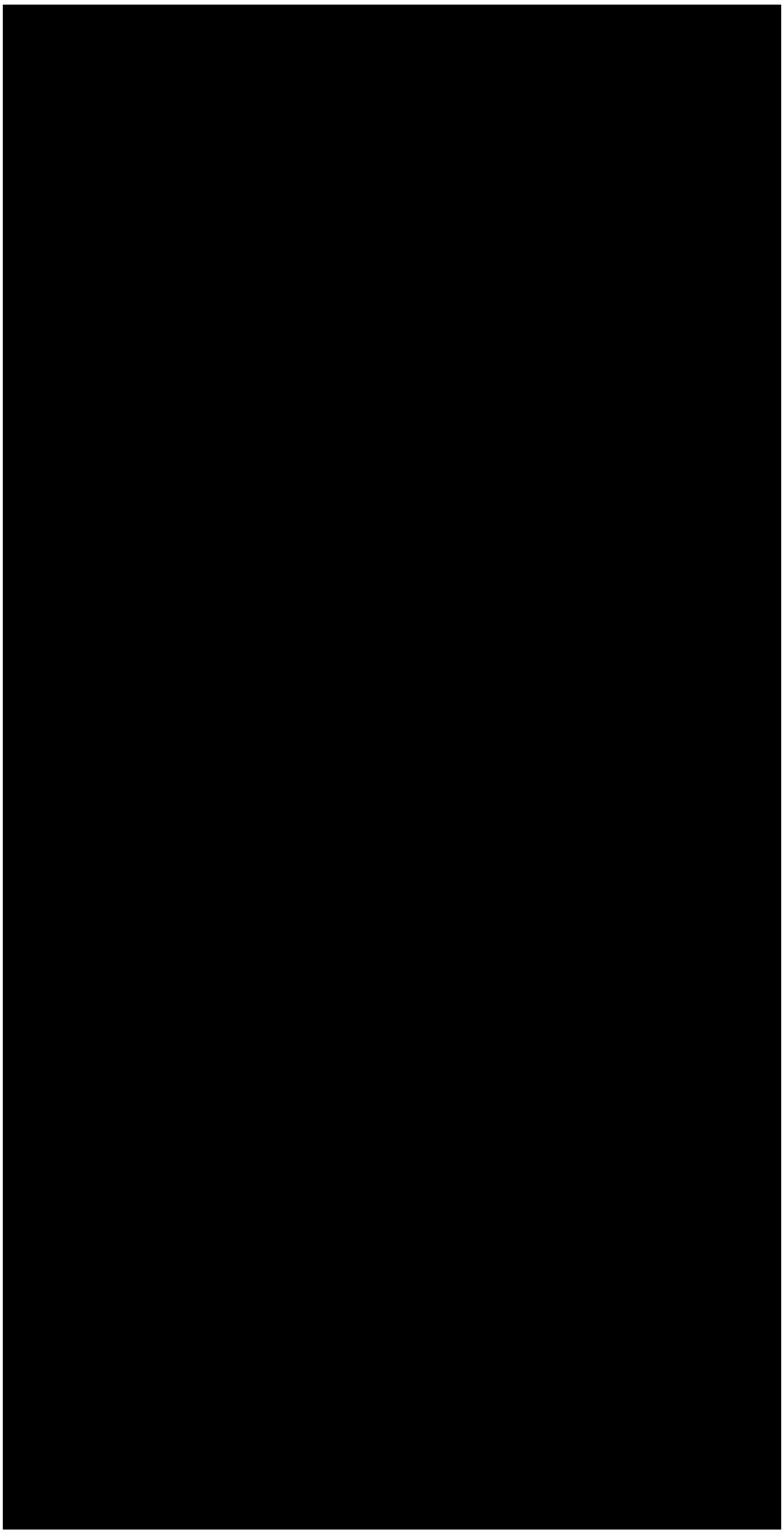
Constructability Review Form: **Substation**



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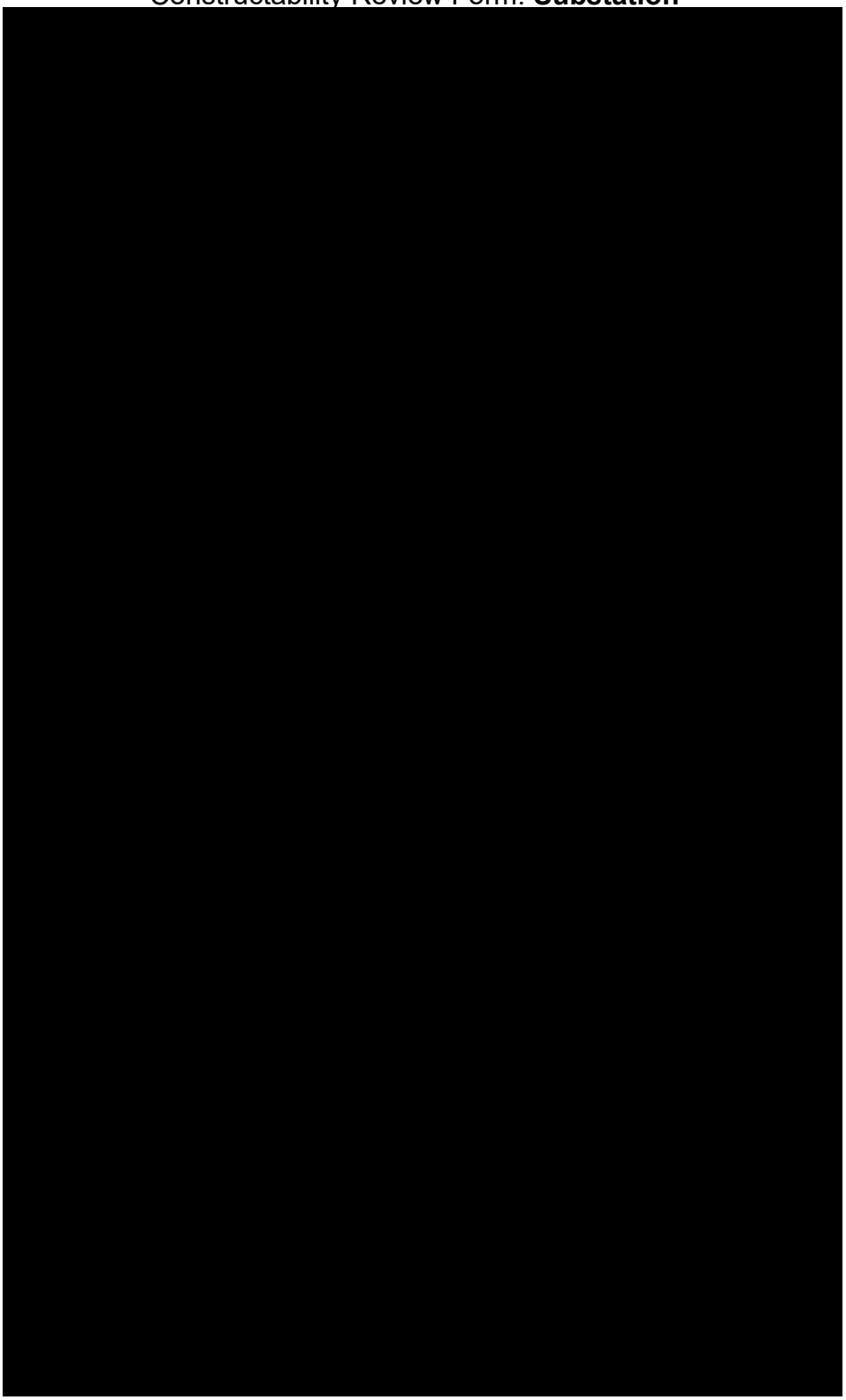
Constructability Review Form: **Substation**



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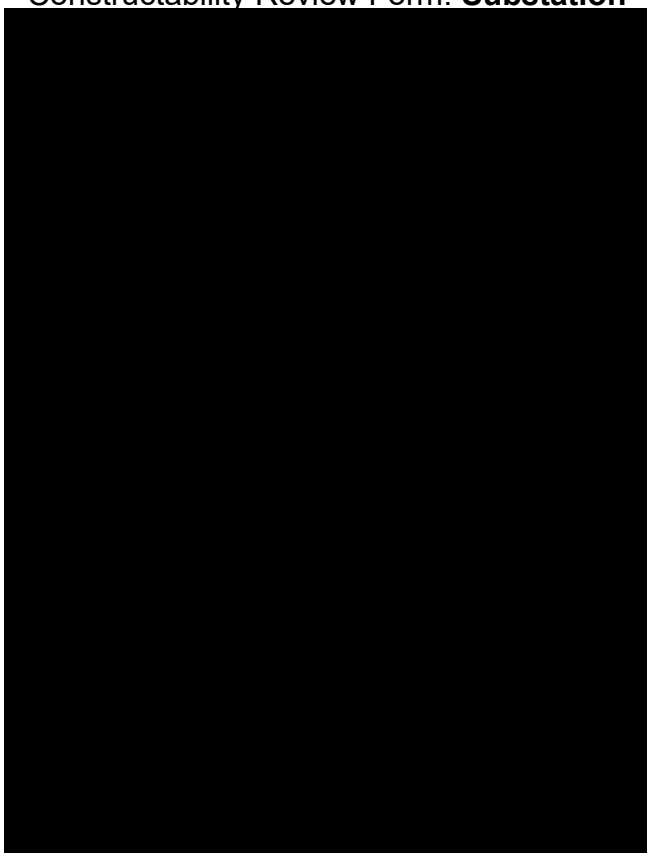
Constructability Review Form: **Substation**



Activity ID	Activity Flag	Activity Name	Original Duration	Start	Finish	DEPT - DEPARTMENT	Resources	Predecessors	Successors
[redacted] - Add OP-18 Metering									
INITIALIZATION AND SCOPE DEVELOPEMENT									
Project Initiation									
EPAC Full Funding									
FF1000	EPAC-F	EPAC Full Funding Approval	1.0	30-Jul-21	30-Jul-21	ENG.AM.ENG		DE1600, PAFF2200	FF1010, DSSE-520, DSSE-500
FF1010	PPA-FF	Full Funding PowerPlan Approval	10.0	02-Aug-21	13-Aug-21	ENG.AM.ENG		FF1000	DSSE-240
T-Minus Milestones									
T-Minus Milestones "A" Group									
AT3001	ENG-SCC	A-T-30.01 - Eng. Project Scoping Document Issued (Scope Lockdown)	0.0		28-Jun-21				
AT1811	ENG-DTL	A-T-18.11 - Detail Design/Engineering Completed	0.0		21-Jul-21			DSSE-205	
AT0805P	P&C-IFC	A-T-08.05.P&C IFC - P&C w/BOM	0.0		03-Aug-21	ENG.AM.COMP		DSSE-220	AT00
AT2404		A-T-24.04 DETERMINE / ASSIGN LCE (LEAD COMMISSIONING ENGINEER)	0.0		05-Aug-21	PM		LCE200	AT00
AT0805E	AG-IFC	A-T-08.05.Elect IFC - Electrical (AG) w/Final BOM	0.0		13-Aug-21	ENG.ST.SS.ELEC		DSSE-240	AT00
AT0805	ENG-IFC	A-T-08.05 - Final Engineering Issued for Construction W/BOM	0.0		13-Aug-21			DSSE-120, DSSE-240, DSSE-22	
AT0409		A-T-04.09 ALL FIRM TOAAPPLICATIONS DUE TO LCC (for DISTRIBUTION Non-transformer equipment)	0.0		20-Aug-21	CONS		A1250	AT00
AT1201		A-T-12.01 SCADA Date (Tab) Sheets/Signal List Sent to LCC	0.0		27-Aug-21	ENG.ST.P&C.P&C		DSSE-990	AT00
AT0404		A-T-04.04 ALL FINAL RELAY PROTECTIVE SETTING ISSUED	0.0		27-Aug-21	ENG.ST.P&C.P&C		DSSE-440	AT00
AT0203		A-T-02.03 CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0.0		27-Aug-21	PM		A1170	AT00
AT0401		A-T-04.01 ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0.0		01-Sep-21	CONS		DSSE-560, DSSE-550, DSSE-10	AT00
AT1202		A-T-12.02 P/C DESCRIPTION / DRAFT OPERATING INSTRUCTIONS ISSUED	0.0		13-Sep-21	ENG.ST.P&C.P&C		DSSE-460, DSSE-930, DSSE-92	AT00
AT1301		A-T-13.01 COMMISSIONING PLAN COMPLETE	0.0		06-Oct-21	PM		LCE500	AT00
AT00	SOC	A-T-00 - START OF CONSTRUCTION - WO#	0.0	07-Oct-21		CONS		AT0805P, AT0203, AT1202, AT04	TOA-Const, BT00, A1120, A114
T-Minus Milestones "B" Group for Transformer Test									
BT1801		B-T-18.01 ALL FIRM TOAAPPLICATIONS DUE TO LCC (for DISTRIBUTION Transformer TEST ENERGIZATI	0.0		01-Sep-21	CONS		A1290	BT00
BT00		B-T-00 - START OF CONSTRUCTION - WO#	0.0	06-Jan-22		CONS		TOA-Const, AT00, BT1801	
ENGINEERING & DESIGN									
Electrical Engineering									
DSSE-260		Submit Electrical Design to Siting & Permitting for Filing w/Regulator Authority	5.0	28-Jun-21	02-Jul-21	ENG.ST.SS.ELEC		PF1000	DE1900
DSSE-200	ES-PREL	Detail (Detail) Electrical Design Package Design to Drafting	5.0	08-Jul-21	14-Jul-21	ENG.ST.SS.ELEC		PF1000, A3380	DE1900, DE1800, DSSE-205
DSSE-205	ES-DTL	Detail (Detail) Electrical Design Package Drafting	5.0	15-Jul-21	21-Jul-21	ENG.ST.SS.ELEC		DSSE-200	AT1811, DSSE-210, DSSE-520
DSSE-210	ES-100%	Final (100%) Electrical Design Package IFR	7.0	22-Jul-21	30-Jul-21	ENG.ST.SS.ELEC		DSSE-205	LCE100, DSSE-220, DSSE-240
DSSE-230		Electrical Engineering - BOM Complete	2.0	02-Aug-21	03-Aug-21	ENG.ST.SS.ELEC		DSSE-210	DSSE-240
DSSE-240	ES-IFC	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	5.0	09-Aug-21	13-Aug-21	ENG.ST.SS.ELEC		FF1010, PF1000, DSSE-210, DS	AT0805, A1290, AT0805E, A117
DSSE-920		Operating Instructions - SSED Review Draft Convex OI	5.0	07-Sep-21	13-Sep-21	ENG.ST.P&C.P&C		DSSE-450, DSSE-440	AT1202
DSSE-460		Operating Instructions - SSED Review Draft Distribution OI	5.0	07-Sep-21	13-Sep-21	ENG.ST.P&C.P&C		DSSE-450, DSSE-440	AT1202
P&C Engineering									
DSSE-400	ES-CONC	Prepare & Issue P&C Design Package to Drafting	3.0	28-Jun-21	30-Jun-21	ENG.ST.P&C.P&C			DE1900, DSSE-410
DSSE-410		Drafting Prepare & Issue Back to P&C	2.0	01-Jul-21	02-Jul-21	ENG.ST.P&C.P&C		DSSE-400	A3380
A3380	ES-PREL	Issue P&C Package Design	2.0	06-Jul-21	07-Jul-21	ENG.ST.P&C.P&C		DSSE-410	AT2605, DSSE-440, DSSE-510
DSSE-220	ES-IFC	SDS Complete (~= P&C IFC)	2.0	02-Aug-21	03-Aug-21	ENG.ST.SS.ELEC		DSSE-210	AT0805P, AT0805, DSSE-990
DSSE-480	CASCADE	P&C INITIATE CASCADE FORMS (Apenndix A) for Construction	10.0	16-Aug-21	27-Aug-21	ENG.ST.P&C.P&C		DSSE-240	CFM

TASK filters: Activity Name N/A or N/R, Not Completed Acts - Completed.

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Activity ID	Activity Flag	Activity Name	Original Duration	Start	Finish	DEPT - DEPARTMENT	Resources	Predecessors	Successors
DSSE-990	SCADA	P&C INITIATE SCADA Data Sheets	10.0	16-Aug-21	27-Aug-21	ENG.ST.P&C.P&C		DSSE-220, DSSE-240	AT1201
DSSE-450		Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	5.0	30-Aug-21	03-Sep-21			DSSE-440	DSSE-920, DSSE-460, DSSE-9
DSSE-470		Operating Instructions - P&C Review Draft Distribution OI	5.0	07-Sep-21	13-Sep-21	ENG.ST.P&C.P&C		DSSE-440, DSSE-450	AT1202
DSSE-930		Operating Instructions - P&C Review Draft Convex OI	5.0	07-Sep-21	13-Sep-21	ENG.ST.P&C.P&C		DSSE-440, DSSE-450	AT1202
Relay Settings									
DSSE-440	ES-RSET	Relay Settings - Prepare and Issue Relay Settings IFC- (Is standard Relay logic Needed?)	20.0	02-Aug-21	27-Aug-21	ENG.ST.P&C.P&C		A3380, FF1000	DSSE-930, DSSE-470, DSSE-4
MATERIAL PROCUREMENT									
MATERIAL FOR P&C									
DSSE-510	DR-RM	MATERIAL - P&C - Prepare & Issue DR	5.0	30-Jun-21	07-Jul-21	ENG.ST.P&C.P&C		A3380	DSSE-980
DSSE-980		MATERIAL - P&C - Procurement Issue PO	10.0	08-Jul-21	17-Jul-21	PURC		DSSE-510	DSSE-1000
DSSE-1000		MATERIAL - P&C - Material Vendor Delivery Leadtime	15.0	18-Jul-21	01-Aug-21	ENG.ST.SS.ELEC		DSSE-980	DSSE-1010
DSSE-1010	M-DELIV	MATERIAL - P&C - Engineering Confirm Material Delivery to Site	1.0	02-Aug-21	02-Aug-21	ENG.ST.SS.ELEC		DSSE-1000	AT0401
MATERIAL FOR ELECTRICAL									
DSSE-520	DR-RM	MATERIAL - Electrical - Prepare & Issue DR	5.0	02-Aug-21	06-Aug-21	ENG.ST.SS.ELEC		FF1000, DSSE-205	DSSE-590, DSSE-1020
DSSE-590	DR-AGM/	Electrical (AG) Material Ordered	0.0		06-Aug-21	ENG.ST.SS.ELEC		DSSE-520	
DSSE-1020		MATERIAL - Electrical - Procurement Issue PO	10.0	07-Aug-21	16-Aug-21	PURC		DSSE-520	DSSE-1030
DSSE-1030		MATERIAL - Electrical - Material Vendor Delivery Leadtime	15.0	17-Aug-21	31-Aug-21	ENG.ST.SS.ELEC		DSSE-1020	DSSE-550
DSSE-550	M-DELIV	MATERIAL - Electrical - Engineering Confirm Material Delivery to Site	1.0	01-Sep-21	01-Sep-21	ENG.ST.SS.ELEC		DSSE-1030	AT0401
CONSTRUCTION									
CONSTRUCTION - ELECTRICAL									
A1130		Construction - Electrical	5.0	07-Oct-21	14-Oct-21	CONS		AT00	CFM
CONSTRUCTION - P&C									
A1140		Construction - P&C Implement Relay Settings	5.0	07-Oct-21	14-Oct-21	CONS		AT00	CFM
CONSTRUCTION - CONST.REP TASKS									
A1280		Construction Rep SUBMIT OUTAGE REQUESTS for TRANSFORMER INSTALLATION (13 weeks before outage	5.0	16-Aug-21	20-Aug-21	CONS		DSSE-120, DSSE-240	
A1290		Construction Rep SUBMIT OUTAGE REQUESTS for TRANSFORMER TEST ENERGIZATION (18 weeks before	5.0	16-Aug-21	20-Aug-21	CONS		DSSE-240, DSSE-120	BT1801
A1250		Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage)	5.0	16-Aug-21	20-Aug-21	CONS		DSSE-240, DSSE-120	AT0409
A1260		Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10.0	06-Jan-22	20-Jan-22	CONS		CFM	A1030
CONSTRUCTION RESOURCE TRACKING									
A1070		RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT	1.0	08-Oct-21	08-Oct-21	CONS		TOA-Const	CFM
ConRep-S		RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	60.0	07-Oct-21	05-Jan-22	CONS		CSM	CFM
A1080		RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN	1.0	05-Jan-22	05-Jan-22	CONS		TOA-Const	CFM
CONSTelec		RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	60.0	07-Oct-21	05-Jan-22	CONS		CSM	CFM
CONSTRUCTION OUTAGES									
CSM	CRH	Construction Start Milestone	0.0	07-Oct-21		CONS		AT00	ConRep-S, TOA-Const, CONST
CFM		Construction Finish Milestone	0.0		05-Jan-22	CONS		A1140, CONSTelec, DSSE-480, A	A1020, A1030, A1040, A1110, D
ISD	ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0.0		05-Jan-22			CFM, LCE700, LCE610	LCE900, LCE800
TOA-Const	OUT	OUTAGE / General Construction Work	77.0	08-Oct-21	05-Jan-22	CONS		AT00, CSM	BT00, A1070, A1080
TEST AND COMMISSION									
LCE PLANNING									
LCE100		PM to Request Lead Commissioning Engineer GO/NO-GO {Preliminary or Detail design is often the predecessor}	2.0	02-Aug-21	03-Aug-21	PM		DSSE-210	LCE200

TASK filters: Activity Name N/A or N/R, Not Completed Acts - Completed.

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Activity ID	Activity Flag	Activity Name	Original Duration	Start	Finish	DEPT - DEPARTMENT	Resources	Predecessors	Successors
LCE200		Assign Lead Commissioning Engineer	2.0	04-Aug-21	05-Aug-21	ENG.ST.SUBTECH.L	[redacted]	LCE100	LCE310, AT2404, LCE320
LCE400	V-COMPL	Develop Test and Commissioning Plan	21.0	09-Aug-21	07-Sep-21	TEST		LCE310, LCE320	LCE500
LCE500	ES-COMF	LCE Review and Approve Vendor's Test and Commissioning Plan	21.0	08-Sep-21	06-Oct-21	ENG.ST.SUBTECH.L		LCE400	AT1301, LCE610, LCE620
TEST ACTIVITIES									
LCE310		Mobilize LCE Prior to Construction	2.0	06-Aug-21	07-Aug-21	ENG.ST.SUBTECH.L		LCE200	LCE400
LCE320		Mobilize Testing Vendor Prior to Construction	2.0	06-Aug-21	07-Aug-21	TEST		LCE200	LCE400
LCE610		LCE Oversee Execution of Test and Commissioning Plan	30.0	07-Oct-21	19-Nov-21	ENG.ST.SUBTECH.L		LCE500	ISD
LCE620		Execute Test and Commissioning Plan	30.0	07-Oct-21	19-Nov-21	TEST		LCE500	LCE700
LCE700		LCE Ensure Test Group Prepare Electrical Field Mark Ups	1.0	22-Nov-21	22-Nov-21	ENG.ST.SUBTECH.L		LCE620	ISD
PROJECT CLOSE OUT									
A3620	ES-FLDA:	Prepare & Submit Civil Field Mark Ups (Tie after Last Civil Construction Activity)	21.0	15-Oct-21	15-Nov-21	ENG.ENGR.FIELD		A1120	A3730
DSSE-1100		Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5.0	06-Jan-22	12-Jan-22	CONS		CFM	
A3640	ES-FLDA:	Prepare & Submit Electrical Field Mark Ups	21.0	24-Jan-22	22-Feb-22	ENG.ENGR.FIELD		LCE900	A3750
A3650	ES-FLDA:	Prepare & Submit P&C Field Mark Ups	21.0	24-Jan-22	22-Feb-22	ENG.ENGR.FIELD		LCE900	A3770
A3670	ES-FLSA:	FE Files Civil Design Drawings at Station	30.0	15-Feb-22	29-Mar-22	ENG.ENGR.FIELD		A3660	A3720
A3680	PM	PM to Document Electrical As-Built Drawings Complete (Electrical, P&C)	1.0	18-May-22	18-May-22	PM		A3780, A3760	A3710, A3690
A3720		Tie to Project Complete Milestone (Delete this Activity and make the tie or make the tie and Dissolve this Activity)	0.0		30-Jun-22			A3710, A3690, A3670	
A3690	ES-FLSA:	FE Files Substation Design Drawings at Station	30.0	19-May-22	30-Jun-22	ENG.ENGR.FIELD		A3680	A3720
A3710	ES-FLSA:	FE Files P&C Design Drawings at Station	30.0	19-May-22	30-Jun-22	ENG.ENGR.FIELD		A3680	A3720
Electrical As-Builts									
A3750	ES-ASB	Eversource Engineering Verifies Electrical Mark Ups and Updates As-Built Drawing Package	55.0	23-Feb-22	10-May-22	ENG.ST.SS.ELEC		A3640	A3760
A3760	ES-ASB	Electrical Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	5.0	11-May-22	17-May-22	ENG.ST.SS.ELEC		A3750	A3680
P&C As-Builts									
A3770	ES-ASB	Eversource Engineering Verifies P&C Mark Ups and Updates As-Built Drawing Package	55.0	23-Feb-22	10-May-22	ENG.ST.P&C.P&C		A3650	A3780
A3780	ES-ASB	P&C Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	5.0	11-May-22	17-May-22	ENG.ST.P&C.P&C		A3770	A3680
Test Closout									
LCE800		LCE Ensures Marked up Prints Ready for Pick-up	1.0	06-Jan-22	06-Jan-22	ENG.ST.SUBTECH.L		ISD	LCE900
LCE900		LCE Review Test Data and Issue Commissioning Report	10.0	07-Jan-22	21-Jan-22	ENG.ST.SUBTECH.L		ISD, LCE800	A3650, A3640
MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT									
A1020		Cost Analyst Prepares FINAL Units of Property	30.0	06-Jan-22	17-Feb-22			CFM	FINISH
A1030		Asset Management Complete Asset Update(s) in CASCADE	30.0	21-Jan-22	04-Mar-22	ENG.AM.COMP		A1260, CFM	FINISH
PROJECT MANAGEMENT CLOSEOUT									
A1040		PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30.0	06-Jan-22	17-Feb-22	PM		CFM	FINISH
A1270		Prepare TD-707 Document	30.0	06-Jan-22	17-Feb-22	PM		CFM	FINISH
FINISH		Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0.0		04-Mar-22	PM		A1020, A1040, A1110, A1270, A1(	
OVERHEAD / INDIRECTS									
PROJECT MANAGEMENT									
A1170		Prepare CAN (Construction Authorization Notice)	10.0	16-Aug-21	27-Aug-21	PM		DSSE-240, DSSE-120	AT0203

TASK filters: Activity Name N/A or N/R, Not Completed Acts - Completed.

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Project Summary

Project Type:	Modeled generator (non-solar)	*
Queue Number:	7005	
Project Name:	Rainbow Hydro	*
Facility Address:	[redacted]	
Market Asset Name(s):	Rainbow 1 Hydro, Rainbow 2 Hydro	
Asset ID(s):	69190, 69181	

Asset Technical Data

Nameplate (MVA):	4.815/4.986	
Winter Interconnection Limit:	4.1/4.1	
Summer Interconnection Limit:	4.1/4.1	
Facility Type:	HDP - Hydraulic Turbine - Conv Daily Pondage	
Energy Source:	Water	*

Projected Dates

In-Service Date: *(ready to receive backfeed power)*	Wednesday, December 1, 2021	*
Initial Sync Date: *(begin trial/test operation)*	Wednesday, December 1, 2021	*
Commercial Operation Date (COD):	Wednesday, December 1, 2021	*

**Actual dates can be extended, but are subject to the Tariff.*

Project Description

2 less than 5 MW hydro units coverting to modeled gens due to being located at a point of common coupling.

Basic Project Information

Lead Market Participant:	*Connecticut Light & Power Company (50092)*	*Existing* *
Designated Entity:	*DE-CES (90087)*	*Existing* *
Transmission Owner/DistCo Market Participant:	*Eversource Energy Service Company (112)*	
Interconnection Point:		
Local Control Center:	*CONVEX*	

Checklist Indicators

Participate in Forward Capacity Market?:	YES		FERC Jurisdictional?:	NO
Resource ID:	35658, 35656		NX-9 Required?:	NO *
Obligation Date:	NA		Intermittent?:	NO *
Resource Lead Participant:	50092		Auto Ring Down (ARD):	NO *
Participate in VAR Market?:	NO		Ops real-time studies required?:	NO *
Participate in Reserve Market?:	NO		Regulation Capable:	NO
Any Load (other than Station Service):	NO		EDC (Dispatchable):	YES
DR behind same retail delivery point?:			DNE Dispatchable:	NO
Composite? (multiple units per asset):			Fast Start Capable:	NO
How many market assets?:	2		Auto Start Capable:	NO
Mapped to UN Node? :	NO	*	ISO Directly Connected RTU?:	YES - Existing *
Automatic Voltage Regulator (AVR) Exempt?:		*	Regional Network Service?:	*
Governor Control Exempt?:		*	Local Transmission Service?:	*

Project Contacts

Organization -	Contact	Name	Email *	Primary Phone
Project -	*Manager*	[redacted]		
Lead Participant -	*Asset Registration*			
Project -	*Interconnection Agreement*			
Project -	*Planning Technical*			
Project -	*Power System Modeling*			
Project -	*Facility Technical*			
Project -	*Communications Technical*			
Local Control Center -	*Lead*			
Local Control Center -	*Technical*			
Transmission Owner/DistCo -	*Lead*			
Transmission Owner/DistCo -	*Technical*			
ISO-NE -	*Asset Registration & Auditing*			
ISO-NE -	*Modeled Asset Coordinator*			
ISO-NE -	*Assistant Coordinator*			
ISO-NE -	*Customer Support*			
ISO-NE -	*Membership Coordinator*			
ISO-NE -	*Resource Adequacy*			
ISO-NE -	*Resource Analysis & Qualification*			
ISO-NE -	*Transmission Strategy & Services*			
ISO-NE -	*Transmission Strategy & Services*			
ISO-NE -	*Transmission Planning*			
ISO-NE -	*Transmission Planning*			
ISO-NE -	*Power System Modeling*			
ISO-NE -	*NX-9 Administration*			
ISO-NE -	*Data Communications*			
ISO-NE -	*IT Communication Projects*			
ISO-NE -	*Transmission Operations Technical Studies*			
ISO-NE -	*Real-Time Studies*			
ISO-NE -	*Transmission Operations Technical Studies*			
ISO-NE -	*System Operations*			
ISO-NE -	*Ops Performance, Training, and Integration*			
ISO-NE -	*Operations Tariff & Agreement Mgr*			
ISO-NE -	*Market Compliance*			
ISO-NE -	*Interconnection Distribution List*			
ISO-NE -	*For Meeting Invites Only*			
ISO-NE -	*For Meeting Invites Only*			
ISO-NE -	*For Meeting Invites Only*			
ISO-NE -	*For Meeting Invites Only*			
ISO-NE -	*For Meeting Invites Only*			
ISO-NE -	*For Meeting Invites Only*			

** - Indicates fields that impact other tabs or functions of this workbook.*

ISO-NE CONFIDENTIAL - COMPLETED FORM

Itemized Checklist to be used by ISO-NE and the Modeled Asset Project Contacts to help meet requirement deadlines

All Email Correspondence related to below items between the Internal ISO Contact and the Modeled Asset Project Contact shall cc: NewGenCoord@iso-ne.com.

Checklist Color Key
Not Applicable
Action Item
Completed
Overdue - Immediate Action Needed

Phase	Category	Itemized ISO-NE Requirements	Contingent	Target/Due Date:	Responsible Party	Date Completed/	Comments
1	System Planning & Operational Studies	01.b) System Impact Study (SIS) complete and As-Studied models uploaded to DDMS		Wednesday, May 5, 2021	*Project - Manager Contact*		
1	Power System Modeling	01.c.) One-Line Diagram - Final		Friday, June 4, 2021	*Project - Power System Modeling Contact*		
1	Real-Time Telemetry	01.d.) Provide Participant with Confidential OP-18, Appendix F and additional forms		Friday, June 4, 2021	*ISO-NE - Modeled Asset Coordinator*		
1	Lead Market Participant Registration	01.f.) Designation of Lead Market Participant		Friday, June 4, 2021	*Project - Manager Contact*		
1	System Planning & Operational Studies	01.g.) Return the Voltage Control Questionnaire		Friday, June 4, 2021	*Project - Manager Contact*		
1	System Planning & Operational Studies	01.h.) "As-Purchased" Generator Data submitted via DDMS *Subject to material modification review if different than the SIS	01.f.)	Friday, June 4, 2021	*Project - Planning Technical Contact*		
1	System Planning & Operational Studies	01.i.) Determination on scope and schedule - Operations real-time studies required		Friday, June 4, 2021	*ISO-NE - Transmission Operations Technical Studies Contact*		
1	RNS/Local Service	01.l.) Discuss Regional Network Service ("RNS") and Local Transmission Service as they relate to the facility and its station service load. Prompt Project - Manager Contact to consult with the affected Transmission Owner and determine if a RNS or LS Application is required to be submitted to ISO-NE.		Friday, June 4, 2021	*ISO-NE - Operations Tariff & Agreement Mgr Contact*		
1	Lead Market Participant Registration	01.m.) Application access provided to the Lead Market Participant	01.f.)	Sunday, July 4, 2021	*ISO-NE - Modeled Asset Coordinator*		
2	Real-Time Telemetry	02.e.) Develop and send the SCADA points list	02.b.)	Wednesday, July 14, 2021	*ISO-NE - Data Communications Contact*	*3/1/2021*	
2	Power System Modeling	02.a.) Facility Modeled	01.c.)	Tuesday, August 3, 2021	*Project - Power System Modeling Contact*		
2	Asset Registration	02.j.) Revenue Quality Metering Requirements understood		Tuesday, August 3, 2021	*Project - Manager Contact*		
2	Real-Time Telemetry	02.k.) Participant and LCC confirmation on required Telemetry	02.e.)	Tuesday, August 3, 2021	*Project - Communications Technical Contact*		
3	Real-Time Telemetry	03.a.) RTU configuration worksheet provided	02.k.)	Monday, August 23, 2021	*ISO-NE - Data Communications Contact*		
3	Real-Time Telemetry	03.b.) Confirmation on RTU configuration	03.a.)	Thursday, September 2, 2021	*Project - Manager Contact*		
3	System Planning & Operational Studies	03.j.) "As-Purchased" Generator Data confirmed to be in good order	01.h.)	Monday, November 1, 2021	*Project - Planning Technical Contact*		
3	Real-Time Telemetry	03.l.) LCC Posts SCADA points to ISO in Bilateral Table	02.j.)	Monday, November 1, 2021	*Local Control Center - Technical Contact*		
3	Asset Registration	03.m.) Preliminary Asset Registration Form(s)	01.f.)	Monday, November 1, 2021	*Lead Participant - Asset Registration Contact*		
4	Asset Registration	04.a.) Network Node Activation Complete	02.a.)	Monday, November 1, 2021	*ISO-NE - Modeled Asset Coordinator*	*7/9/2021*	Confirmed to be an already activated LD PNode
4	System Planning & Operational Studies	04.b.) Operational Guides completed for Initial Sync	01.i.)	Monday, November 1, 2021	*ISO-NE - Transmission Operations Technical Studies Contact*		
4	Voice Communications	04.c.) ARD - Voice Circuits installed and successfully tested	03.e.)	Monday, November 1, 2021	*ISO-NE - IT COMM Contact*		
6	System Planning & Operational Studies	06.j.) Confirmation of VAR Capability Testing CROW application submittal	04.q.)	Tuesday, November 16, 2021	*Lead Participant - Asset Registration Contact*		
6	Asset Registration	06.k.) IMMAC Prompt for Commercial Operation	04.a.)	Tuesday, November 16, 2021	*ISO-NE - Market Compliance Contact*		
4	System Planning & Operational Studies	04.i.) AVR and/or Governor Control requirements met	01.b.)	Wednesday, November 17, 2021	*Project - Planning Technical Contact*		
4	Real-Time Telemetry	04.j.) Router installed and tested	03.k.)	Wednesday, November 17, 2021	*ISO-NE - IT Comm. Projects Contact*		
5	System Planning & Operational Studies	05.h.) Voltage Schedule agreed upon & applicable documents received	01.i.)	Wednesday, November 17, 2021	*ISO-NE - Real-Time Studies Contact*		
4	Real-Time Telemetry	04.l.) Complete RTU testing	04.j.)	Wednesday, November 24, 2021	*ISO-NE - Data Communications Contact*		
4	Asset Registration	04.m.) Local Control Center requirements met		Wednesday, November 24, 2021	*Local Control Center - Lead Contact*		
4	Asset Registration	04.n.) Revenue Quality Metering (RQM) in place and ready	02.j.)	Wednesday, November 24, 2021	*Transmission Owner - Lead Contact*		
4	Lead Market Participant Registration	04.o.) Access to eMarket & eMarket Sandbox asset visibility	01.m.)	Wednesday, November 24, 2021	*ISO-NE - Modeled Asset Coordinator*		
4	System Planning & Operational Studies	04.q.) ISO-NE required testing scheduled	03.n.)	Wednesday, November 24, 2021	*Project - Manager Contact*		
5	Asset Registration	05.b.) Signed Modeled ARF	03.m.)	Wednesday, November 24, 2021	*Lead Participant - Asset Registration Contact*		
5	Asset Registration	05.e.) Technical Data (NX-12) Final Revision	02.n.)	Wednesday, November 24, 2021	*Lead Participant - Asset Registration Contact*		
5	Asset Registration	05.f.) Designated Entity (DE) Registration Form	02.o.)	Wednesday, November 24, 2021	*Lead Participant - Asset Registration Contact*		
5	System Planning & Operational Studies	05.i.) Operations and Operations Support Services check	04.b.)/05.h.)	Wednesday, November 24, 2021	*ISO-NE - Modeled Asset Coordinator*		
5	Asset Registration	05.j.) Provide Non-Commericial Testing Communications protocol to Lead Participant and Designated Entity	05.f.)	Wednesday, November 24, 2021	*ISO-NE - Modeled Asset Coordinator*		
6	System Planning & Operational Studies	06.l.) AVR Testing - Step Test completed	04.q.)	Wednesday, November 24, 2021	*ISO-NE - System Planning Technical Contact*		
6	System Planning & Operational Studies	06.m.) Governor speed control testing completed	04.q.)	Wednesday, November 24, 2021	*ISO-NE - Transmission Operations Technical Studies Contact*		
6	System Planning & Operational Studies	06.n.) VAR Capability Testing - Lagging and leading reactive capability testing completed	04.q.)	Wednesday, November 24, 2021	*ISO-NE - Transmission Operations Technical Studies Contact*		
6	System Planning & Operational Studies	06.o.) Operational Guides completed for Commercial Operation	04.b.)	Wednesday, November 24, 2021	*ISO-NE - Transmission Operations Technical Studies Contact*		
6	System Planning & Operational Studies	06.s.) Voltage Task Force approval granted	05.h.)	Wednesday, November 24, 2021	*ISO-NE - Real-Time Studies Contact*		
6	Asset Registration	06.t.) Verify Voltage and Reactive Control Data (NX 12D)	02.p.)	Wednesday, November 24, 2021	*ISO-NE - Transmission Operations Technical Studies Contact & Project - Facility Technical Contact*		
6	System Planning & Operational Studies	06.w.) Voltage Schedule Notification to the Lead Market Participant	06.q.)	Saturday, November 27, 2021	*ISO-NE - Real-Time Studies Contact*		
7	Asset Registration	07.a.) Submittal of Ask ISO Issue declaring Commercial Operation		Sunday, November 28, 2021	*ISO-NE - Assistant Coordinator Contact & Lead Participant - Asset Registration Contact*		
7	Asset Registration	07.b.) Process in CAMS, SMS and APF MOI (for ATRRs only) for Commercial Operation	07.a.)	Monday, November 29, 2021	*ISO-NE - Assistant Coordinator Contact*		
3	System Planning & Operational Studies	03.i.) Proposed Plan (PPA) Non-Denial (Letter from VP, System Planning following RC)	02.q.)	Tuesday, November 30, 2021	*ISO-NE - System Planning Technical Contact*		
5	System Planning & Operational Studies	05.k.) IA Executed	03.i.)	Tuesday, November 30, 2021	***ISO-NE - Transmission Strategy & Services Contact***	***7/9/2021***	Already existing IA
6	Real-Time Telemetry	06.a.) RTU Contact information received from the Lead Participant	04.l.)	Tuesday, November 30, 2021	*Project - Manager Contact*		
6	Voice Communications	06.b.) ISO Control Room phone system programmed	05.f.)	Tuesday, November 30, 2021	*ISO-NE - Assistant Coordinator Contact*		
6	Asset Registration	06.c.) ISO-NE Control Room Asset Initial Sync (or Minimal Responsiveness Test for ATRRs) Notification & Shift Supervisor phone call	05.b.)	Tuesday, November 30, 2021	*ISO-NE - Modeled Asset Coordinator*		
6	Asset Registration	06.d.) Lead Market Participant Confirmation	05.b.)	Tuesday, November 30, 2021	*ISO-NE - Modeled Asset Coordinator*		
6	System Planning & Operational Studies	06.p.) DDMS As Built Models in line with ISO-NE required testing results and submittal completed in full	06.n.)	Tuesday, November 30, 2021	*ISO-NE - System Planning Technical Contact*		
6	Real-Time Telemetry	06.e.) RTU moved onto the production Electronic Dispatch Server	04.l.)	Wednesday, December 1, 2021	*ISO-NE - Data Communications Contact*		
6	Real-Time Telemetry	06.f.) Verify good telemetry from asset(s)	06.e.)	Wednesday, December 1, 2021	*ISO-NE - Data Communications Contact*		
7	Asset Registration	07.k.) Lead Market Participant Commercial Operation Authorization	07.b.)	Wednesday, December 1, 2021	*ISO-NE - Modeled Asset Coordinator*		
7	Asset Registration	07.m.) Commercial Operation Notification to Day Ahead to Remove Outage Flag	07.l.)	Wednesday, December 1, 2021	*ISO-NE - Modeled Asset Coordinator*		
8	Asset Registration	08.a.) Create audit records from previous assets and connect audit history		Wednesday, December 1, 2021	*ISO-NE - Modeled Asset Coordinator*		
8	Asset Registration	08.b.) MDE needed to capture asset's output history in the FCM Failure to Cover Determination		Wednesday, December 1, 2021	*ISO-NE - Modeled Asset Coordinator*		
8	Asset Registration	MDE the real Initial Sync and COD from previous SOG assets		Wednesday, December 1, 2021	*ISO-NE - Modeled Asset Coordinator*		