EVERSOURCE

Operations Project Authorization Form

Approved on August 3, 2022 EPAC

Link to Meeting Minutes

Project Title: [redacted] **Relay Upgrades**	**Project Number: CS00463**
Date Prepared: 07/13/2022	**Company: Eversource CT**
Organization: Asset Management	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Relays**
Managing Organization: Transmission / Major Projects	**Schedule ID#: CS00463**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Capital Investment part of original Op Plan: Yes**
Estimated in service date: 3/13/2023	**Emergency Related Request? No**
Eng./Constr. Resources Budgeted? Yes	**Facility Type (check all that apply):** ☐ PTF ☐ non-PTF ☒ Distribution ☐ N/A (General Plant)
Total Capital Request: $1.198M	**Authorization Type: Full Funding**

[1] Executive Summary

This project at the [redacted], is seeking full funding in the amount of $1.198M to replace [redacted].

[redacted]

[redacted]

[redacted]

[redacted]

Project CS00463 initially received $125K of initial funding approved in PowerPlan on March 1, 2021. The Initial Funding request was revised and approved for $200K in PowerPlan on April 19, 2022. As of July 12, 2022, the initial funding has been spent to complete the preliminary design under CS00463 work order 20220427.

This project was presented to and approved by the Solution Design Committee (SDC) on June 22, 2022. This work was originally included in the Connecticut Electromechanical Relay Replacement Program CS00488 to replace all electromechanical relays and obsolete microprocessor relays still in service at all Eversource CT distribution substations. This work is being performed prior to the program due to specific known issues [redacted].

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[2] PROJECT COSTS SUMMARY

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2022 to Go	2023	2024	Total
1. ROW / Easements / Land Acquisition						
2. Environmental Approvals / Permits						
3. Outreach						
4. Siting Approvals / Permits						
5. Engineering / Design		$79	$150	$100		$329
6. Materials (Eversource purchased)			$47	$8		$55
7. Construction (incl matl's by contractors)		$0	$66	$12		$78
8. Testing / Commissioning		$1	$56	$57		$115
9. Project Mgmt Team		$43	$5	$3		$51
10. Removals			$1	$0		$2
11. Other						
12. Risks			$70	$25		$95
SUBTOTAL DIRECTS W/ RISKS	**$200K**	**$124**	**$396**	**$205**		**$724**
13. Indirects/Overhead		$77	$197	$116		$390
14. AFUDC		$4	$33	$11		$47
PROJECT TOTAL – BASELINE BUDGET	**$200K**	**$204**	**$626**	**$331**		**$1,161**
15. Contingency			$24	$12		$36
TOTAL CAPITAL REQUEST	**$200K**	**$204**	**$650**	**$344**		**$1,198**
16. Reimbursables/Customer Contribution						
PROJECT TOTAL (LESS REIMBURSABLES)	**$200K**	**$204**	**$650**	**$344**		**$1,198**
O&M						
TOTAL REQUEST	**$200K**	**$204**	**$650**	**$344**		**$1,198**

Detail other costs, project risk items and their allocations:

Risk	Allocation
1. Asbestos in Relay Panel or Existing Control Room Removal	$20K
2. Severe Weather, Delays, OT	$30K
3.Design Development	$25K
4. Overtime due to outage durations	$20K
5.	$
Total	$95K

Explain unique payment provisions, if applicable:

NA

Identify and detail any unique O&M impacts resulting from this project:

NA

[3] Technical Justification

Project Need, Objective and Justification



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Project Scope

Scope of work includes the following:

[redacted]



[redacted]

A constructability review was performed on April 29, 2020 and again on May 18, 2022. The Constructability review form is included as Attachment C.

Substation Equipment

Station	Device Position /	Device Removals	Device Additions
[redacted]			

Background

[redacted]

[redacted]

[4] ALTERNATIVES CONSIDERED

This project was presented to and approved by the Solution Design Committee (SDC) on June 22, 2022.

Alternative #1

Do nothing and replace relays as they fail. [redacted]

Alternative #2 (Preferred Solution)

[redacted] The planning grade estimated cost for this solution is $1.198M.

[5] PROJECT SCHEDULE

Milestone	Scheduled Completion Date
IFR Approval	3/1/2021
SDC Approval (for applicable projects)	6/22/2022
Preliminary Design Completion (or latest pre-full funding design phase)	5/10/2022
EPAC Full Funding Approval	8/26/2022
Start of Construction	10/31/2022
Project In-Service Date (ISD)	3/13/2023

The P6 schedule is included as Attachment B.

[6] REGULATORY APPROVALS

N/A

[7] RISK AND RISK MITIGATION PLANS

Contingency:

Contingency of $36K has been included for this project for unanticipated unknowns.

Risk Mitigation:

Risk	Mitigation
1. Asbestos in Relay Panel or Existing Control Room Removal	Verify presence or absence of asbestos before beginning work. Risk allocation is also included in the estimate.
2. Severe Weather, Delays, OT	Allow time in schedule for delays. Risk allocation is also included in the estimate.
3.Design Development	Check in regularly with designers. Risk allocation is also included in the estimate.
4. Overtime due to outage durations	Minimize overtime where possible. Verify outage durations with construction and testing. Risk allocation is also included in the estimate.
5. SCLL conditions.	Temporary relay will be provided to protect from SCLL condition for each transformer during outages.

[8] REFERENCES

References
1. CS00463 [redacted] Obsolete Distribution Relay Replacement – IFR, dated 2/19/2021
2. CS00463 [redacted] KCGG Rly Rplc-IFR-R1, dated 4/14/2022
3. CS00463 [redacted] KCGG Rly Rplc-SSF, dated 7/15/2022
4.
5.

[9] ATTACHMENTS (One-Line Diagrams, Images, etc.)

Attachment	Included in Submittal?
A. Cost Estimate	YES
B. P6 Schedule	YES
C. Constructability Review	YES
D. System and Station One-Lines	NO

Project Checklist - Transmission & Substation Capital Project		
Project Name: [redacted]	**Relay Upgrades**	**Project Number: CS00463**
Facility Type: ☐BPS ☐BES ☐PTF ☐PTF non-regional ☐non-PTF ☐CIP ☒Distribution ☐General Plant		
PLANNING		
Is a NX-9 required?	Yes	
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	
ISO-NE Approval Date (if completed):	Enter Date	
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?	Yes	
Has an outage schedule been approved?	Yes	
Are Operations & Maintenance procedures/training required?	No	
STANDARDS		
Does the project include standard equipment and designs?	Yes	
SUBSTATION ENGINEERING		
Does this impact Revenue Metering	No	
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] Relay Upgrades		**Project Number: CS00463**
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	
PROJECT SERVICES (OUTREACH) and ROW WORK COORDINATION		
What is the level of outreach expected?	None	
Is any part of this project in an Environmental Justice Community?	No	
Has ROW Coordination reviewed this project?	No	
Is this project coordinating with other existing scheduled work?	No	
INITIATOR		
Has a field constructability review been completed?	Yes	
INVESTMENT RECOVERY		
Does the project require development of an Investment Recovery plan?	No	
COST ESTIMATING		
What team/firm prepared the cost estimate?	Estimate was prepared by Eversource Engineering	
Name of the person who prepared the estimate:	[redacted]	
Was the estimate reviewed by Eversource Estimating?	Yes - Partial Review	

ESTIMATE SUMMARY

Project Title: [redacted] Replace Relay
Project Manager: [redacted]
Project Number: CS00463
WO & Task #: 80053196
Estimate revision #: 00
Estimate Type - Station work

Estimate #: TBD
Date of Estimate: 04/26/2022
Estimate done by: [redacted]
In Service date: [redacted]

Template Revision # 01.10a

All Estimate Summary for PP4 Calc (escalation separate)

Estimate #: TBD
Date of Estimate: 04/26/2022

Project Number: CS00463
WO & Task #: 80053196

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2022	2023	2024	2025	2027	2028	2029	2030	2031
1	ROW / Easements / Land purchases													
2	Environmental Approvals / Permits													
3	Outreach													
4	Siting Approvals / Permits													
5	Engineering / Design	$329,000	45.4%	27.5%	$79,100	$150,300	$99,600							
6	Materials (Eversource purchased)	$55,400	7.6%	4.6%		$47,000	$8,400							
7	Construction (Incl mat'ls by contractors)	$78,100	10.8%	6.5%	$300	$65,800	$12,000							
8	Testing / Commissioning	$114,500	15.8%	9.6%	$1,200	$56,500	$56,800							
9	PMT Project Mgmt Team	$50,600	7.0%	4.2%	$42,900	$5,000	$2,700							
10	Removals	$1,700	0.2%	0.1%		$1,400	$300							
11	Other													
12	Risks	$95,000	13.1%	7.9%		$70,000	$25,000							
135	**Project Directs Total w/Risks**	**$724,300**	100.0%	60.5%	**$123,500**	**$396,000**	**$204,800**							
13	Indirects/Overhead	$389,900		32.6%	$77,000	$197,200	$115,700							
14	AFUDC	$47,000		3.9%	$3,600	$32,500	$10,900							
136	**Project Total - Baseline Budget**	**$1,161,200**		97.0%	**$204,100**	**$625,700**	**$331,400**							
15	Contingency	$36,400		3.0%		$24,100	$12,300							
	Project Total - Funding Approval Level	**$1,197,600**		100.0%	**$204,100**	**$649,800**	**$343,700**							
16	Reimbursables/Customer Contribution													
194	**Project Total (less reimbursables)**	**$1,197,600**			**$204,100**	**$649,800**	**$343,700**							
	Cost per key qty (if appl)	-	$'s / EA											
	Amount of Escalation included above	$8,500					$8,500							
6	Total materials - Eversource	$55,400				$47,000	$8,400							
	Total materials - Contractor													
	Total materials	$55,400				$47,000	$8,400							

NOTE: Risk / Contingency is 12.3% of Project Total Costs (Incl escal/Indirects/AFUDC but excl reimb.)

Estimate Range	**-25%**	**25%**
	$898,000	**$1,497,000**

	TOTAL w/ escal broken out
ROW / Easements / Land purchas	$ -
Environmental Approvals / Permit	$ -
Outreach	$ -
Siting Approvals / Permits	$ -
Engineering / Design	$ 326,100
Materials (Eversource purchased	$ 55,300
Construction (Incl mat'ls by cont	$ 77,700
Testing / Commissioning	$ 112,900
PMT Project Mgmt Team	$ 50,500
Removals	$ 1,600
Other	$ -
Risks	$ 95,000
	$719,100
Indirects/Overhead	$ 386,500
AFUDC	$ 47,100
	$ -
	$1,152,700
	$ -
Contingency	$ 36,400
	$1,189,100
	$ -
	$ -
	-
	$1,189,100
	$ 8,500
Excel total	**$1,197,600**
Check total	

COMMENTS

Project Scope:
Key qty's and UOM (tie to inputs on est sheets)

- EA

[redacted]

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

Engineering to be completed with EDC resources per vendor quotation, construction to be outsourced.
Field Engineering Test to be outsourced.
This estimate is based on TPS description only, actual quantities may vary during detailed engineering.
All new equipment will be installed within the confines of the existing controlenclosure & fenced yard.
Allowances have been added for aggressive outage recall times for inclemate weather.
Estimate includes an average of contingency on direct costs which equates to contingency of total cost.
Existing Lock Out relays will be reused for transformer protection.
A preliminary battery calculation will be performed. If necessary, changes required to the station battery will be implemented under a separate project.

RISKS

Asbestos Relay Panel and or Existing Control Room Removal	$ 20,000
Severe Weather. Delays. OT	$ 30,000
Design disalignment	$ 25,000
Overtime due to Outage Durations	$ 20,000

CSTXX-CONSTRUCTION	R	Prior Mhrs	Prior DOLLARS	2022 Mhrs	2022 DOLLARS	2023 DOLLARS	2024 Mhrs	2024 DOLLARS	2025 Mhrs	2025 DOLLARS	2026 Mhrs	2026 DOLLARS	2027 Mhrs	2027 DOLLARS	2028 Mhrs	2028 DOLLARS	2029 Mhrs	2029 DOLLARS	2030 Mhrs	2030 DOLLARS	2031 Mhrs	2031 DOLLARS	TOTAL Mhrs	TOTAL DOLLARS
Electrical Construction	LT																						
General Construction	LT		$250																				$250
SCADA / Automation	LT																						
Telecom - Field	LT																						
Construction Reps (internal)	LT																						
Support Switch/Tag	LT																						
Other (specify)	LT																						
Other (specify)	LT																						
Other (specify)	LT																						
LT Total			$250																				$250
Employee Expenses	AE																						
Construction Purchased Material	AM				$658	$116																	$774
Outside Construction Vendor	AQ				$66,832	$11,617																	$77,449
Sales tax on Const. Vendor																							
Vehicles (now in indirects section)	AV																						
Inspection services (Outside Vendor)	AQ																						
Construction Rea (Outside vendor)	AQ																						
Rents and Leases	BR																						
CSTXX Subtotal			$250		$66,490	$11,733																	$78,473
Escalation	LT																						
CSTXX Total			$250		$66,490	$11,733																	$78,473
ENRXX-TG ENGINEERING/DESIGN																							
Project Services/Drafting	LT																						
T- Line Engineering/Design	LT																						
D- Street Engineering/Design	LT																						
Civil Engineering/Design	LT																						
Substation (T) Engineering/Design	LT																						
Substation (D) Engineering/Design	LT		$1,294		$3,360	$1,575																	$6,229
Protection & Controls Engineering	LT		$2,589		$6,350	$3,402																	$12,341
Survey Engineering	LT																						
SCADA / Automation Engineering	LT																						
Telecom Engineering	LT																						
Other - specify	LT																						
Other - specify	LT																						
LT Total			$3,884		$9,710	$4,977																	$18,571
Employee Expenses	AE				$486	$249																	$735
Contractor Engineering - T-Lines	AQ																						
Contractor Engineering - D-Street	AQ																						
Contractor Engineering - T -Station	AQ																						
Contractor Engineering - D-Station	AQ		$19,752		$37,680	$21,980																	$79,412
Contractor Engineering - P&C	AQ		$55,483		$102,384	$69,520																	$227,387
Contractor Engineering - Survey	AQ																						
Contractor Engineering - SCADA / Automation	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			$79,118		$150,269	$96,726																	$326,104
Escalation																							
ENRXX Total			$79,118		$150,269	$96,726																	$326,104
LNDXX-TG LAND																							
Real Estate	LT																						
Employee Expenses	AE																						
Purchase Land	AM																						
Vehicles (now in indirects section)	AV																						
Fees and Payments	BF																						
LNDXX Subtotal																							
Escalation																							
LNDXX Total																							
MATXX-TG MATERIAL																							
Eversource	AM				$44,645	$7,879																	$52,524
Outside Services	AM																						
	AM																						
Freight																							
Sales Tax Eversouce/outside services	3.9%				$1,700	$300																	$2,000
Other																							
MATXX Subtotal					$46,345	$8,179																	$54,524
Escalation																							
MATXX Total					$46,345	$8,179																	$54,524
PSMXX-PROJECT MANAGER & SUPPORT																							
Project Management (PM)	LT		$4,454		$2,184	$1,638																	$8,276
Project Planning/Cost (IP)	LT				$790	$395																	$1,185
Contracts/Purchasing (C/P)	LT				$858	$429																	$1,287
System Planning	LT																						
Environmental	LT																						
SCS - None	LT																						
Legal	LT																						
Estimating	LT																						
Siting - None	LT																						
Asset Management	LT				$907																		$907
Other -	LT																						
Other -	LT																						
Other -	LT																						
LT Total			$4,454		$4,739	$2,462																	$11,655
Employee Expenses	AE				$237	$123																	$360
Project Support Vendor - PM	AQ		$38,463																				$38,463
Project Support Vendor - IP	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																						
Builder All risk insurance excluding deductables(if project is over $50m)	BR																						
Fees and Payments - Enviromental	BF																						
Fees and Payments - Siting	BF																						
Fees and Payments - Other	BF																						
PSMXX Subtotal			$42,917		$4,976	$2,585																	$50,478
Escalation																							
PSMXX Total			$42,917		$4,976	$2,585																	$50,478
REMXX-TG REMOVAL																							
Engineering/Design	LT																						
Internal Construction	LT																						
LT Total																							
Employee Expenses	AE																						
Outside Services	AQ																						
Contractor Labor	AQ				$1,384	$244																	$1,628
Vehicles (now in indirects section)	AV																						
Rents and Leases	BR																						
REMXX Subtotal					$1,384	$244																	$1,628
Escalation																							
REMXX Total					$1,384	$244																	$1,628
TSTXX-TG TEST																							
Test / Field Engr. Labor (In House)	LT		$1,234																				$1,234
Lead Commissioning Engr. (LCE) (internal)	LT																						
Employee Expense	AE																						$123
Test / Field Engr. Labor (contractor)	AQ				$28,675	$30,525																	$59,200
Lead Commissioning Engr. (LCE) (contactor)	AQ				$27,820	$24,610																	$52,430
Vehicles (now in indirects section)	AV																						
TSTXX Subtotal			$1,234		$56,495	$55,135																	$112,987
Escalation																							
TSTXX Total			$1,234		$56,495	$55,135																	$112,987
SUBTOTAL PROJECT DIRECT COST		-	**$123,520**		**$325,950**	**$174,602**																39	**$624,195**
Risk																							
Risk					$70,000	$25,000																	$95,000
					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
					$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	
Risk Total					$70,000	$25,000																	$95,000
TOTAL PROJECT DIRECT COST (w risk)		-	**$123,520**		**$395,950**	**$199,602**																39	**$719,195**
INDIRECTS																							
Non-Productive Time Allocation (**ZNP**)	17.0%		$1,597		$2,456	$1,265																	$5,318
Payroll Benefits Allocation (**ZPB**) incl NPT	44.0%		$176																				$176
Gen SVC CO Overhead (**ZGS**) incl NPT	80.0%		$6,316		$13,524	$6,963																	$26,803
E&S Allocations (**ZEB,ZEL,ZES**)	50.0%		$58,861		$147,102	$87,082																	$293,045
AS&E Allocations (**ZAS**)	1.3%		$2,074		$6,113	$3,374																	$11,561
Stores Expense Allocation (**ZST**)	8.0%				$3,572	$630																	$4,202
Lobby Stock			$0																				$0
MDEC (**ZMI**)	6.0%		$7,709		$20,374	$10,945																	$39,028
Vehicles (**ZVE**)	28.0%		$247		$4,046	$2,083																	$6,376
Indirects Subtotal			$76,980		$197,187	$112,342																	$386,509
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)			**$200,500**		**$593,137**	**$311,944**																	**$1,105,704**
AFUDC																							
AFUDC (ZK)			$3,645	6.50%	$32,546	$10,941	6.50%		6.50%		6.50%		6.50%		6.50%		6.50%		6.50%		6.50%	1	$47,132
In Service Dollars																							
Cumulative ISS					-	-	-		-		-		-		-		-		-		-		
AFUDC Subtotal			$3,645		$32,546	$10,941																	$47,132
TOTAL PROJECT COST - Baseline Budget			**$204,144**		**$625,683**	**$322,885**																	**$1,152,835**
Contingency																							
Contingency					$24,108	$12,331																	$36,439
Other			$ -		$ -	$ -	$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		
Contingency SubTotal					$24,108	$12,331																	$36,439
TOTAL PROJECT COST - Approved Funding			**$204,144**		**$649,791**	**$335,215**																	**$1,189,274**
Reimbursables / Customer Contribution																							
Reimbursables / Customer Contribution (enter as negative)			$ -		$ -	$ -	$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		

Activity Flag	Activity ID	Activity Name	At ompletion Duration	Start	Finish	Resources
CS00463 [redacted] KCGG Relaying Replacement (CS00463 / 800!			688	12/01/20 08 A	08/25/23 16	
CS00463.01 INITIALIZATION AND SCOPE DEVELOPMENT			474	12/21/20 00 A	11/08/22 16	
	START10	SCHEDULE START MILESTONE (Compo)	0	12/21/20 00 A		
CS00463.01.2 Initial Funding			61	02/16/21 08 A	05/11/21 16 A	
	PI1210	Project Initiator Develop & Submit Intitial Funding Request (Compo)	50	02/16/21 08 A	04/26/21 16 A	
EPAC-I	PI1310	Initial EPAC Funding Request Approved (Compo)	0		04/27/21 16 A	
PM-AM	PI1410	Assign Project Manager (Compo)	5	05/05/21 08 A	05/11/21 16 A	
PM	PI1510	Assign Scheduler (Compo)	5	05/05/21 08 A	05/11/21 16 A	
	PI1620	Assign Cost Analyst (Compo)	5	05/05/21 08 A	05/11/21 16 A	
PPA-IF	PI1630	Initial Funding EPAC / PowerPlan Approval (Compo)	10	04/28/21 08 A	05/11/21 16 A	
CS00463.01.09 Project Initiation			326	05/12/21 08 A	08/26/22 16	
CS00463.01.09.00 Engineering Scope Development			214	05/12/21 08 A	03/21/22 16 A	
	PE1400	Develop P&C Engineering Scope Design in Accordance with Deliverables Checklist (Compo)	10	05/12/21 08 A	05/25/21 16 A	
	PE1710	Create Engineering Scope Document (Compo)	1	05/26/21 08 A	05/26/21 16 A	
Scope Cor	PE1720	Engineering Scope Document Complete (Compo)	0		05/26/21 16 A	
V-CONCPT	PE1730	Vendor Engineer Develop Conceptual Design (Compo)	7	02/23/22 00 A	03/04/22 00 A	
ES-CONCP	PE1740	Substation Engineering Review Conceptual Design (Compo)	5	03/07/22 00 A	03/11/22 16 A	
ES-CONCI	PE1750	Telecom Engineering Review Conceptual Design (Compo)	11	03/07/22 00 A	03/21/22 16 A	
CS00463.01.09.02 Electrical Engineering Preliminary Design			42	03/14/22 08 A	05/10/22 16 A	
V-PRELIM	A22680	Vendor Engineer Develop SS Preliminary Design (Compo)	31	03/14/22 08 A	04/25/22 16 A	
ES-PRELIM	A22690	Substation Engineering Review SS Preliminary Design (Compo)	11	04/26/22 08 A	05/10/22 16 A	
ES-PRELI	A22700	Telecom Engineering Review SS Preliminary Design (Compo	11	04/26/22 08 A	05/10/22 16 A	
CS00463.01.09.06 P&C Engineering Preliminary Design			40	03/14/22 08 A	05/09/22 00 A	
V-PRELIM	DE2090	Vendor Engineer Develop P&C Preliminary Design (Compo)	31	03/14/22 08 A	04/25/22 16 A	
ES-PRELI	DE2100	P&C Engineering Review P&C Preliminary Design (Compo)	9	04/26/22 08 A	05/09/22 00 A	
CS00463.01.09.2 EPAC Partial Funding			20	02/22/22 08 A	03/21/22 16 A	

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Activity Flag	Activity ID	Activity Name	At ɔmpletion Duration	Start	Finish	Resources
	A22840	Request Engineering Resource Assignments	5	02/22/22 08 A	02/28/22 16 A	
	A22730	N/R_Partial Funding Not Required, will go to full funding	1	03/21/22 08 A	03/21/22 16 A	
CS00463.01.09.3 EPAC Full Funding			86	04/27/22 08 A	08/26/22 16	
	DE1910	Conduct Detail Constructability Walk Down (Compo)	1	04/27/22 08 A	04/27/22 16 A	[redacted]
Construct	DE2010	Project Constructability Review Complete (Compo)	1	04/29/22 08 A	04/29/22 16 A	
	DE1710	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM) (Compo)	23	04/28/22 08 A	05/31/22 16 A	
EST-FULL	DE1610	Create Planning Grade Estimate (+/-25% Full Funding) (Compo)	19	05/09/22 08 A	06/03/22 16 A	
	PAFF2010	Submit Full Funding PAF for Internal Review (Compo)	2	06/23/22 08 A	06/24/22 16 A	
PAF Submit	PAFF2120	Incorporate Internal Review Comments - including battery calculations - Submit Full Funding PAF to EPAC (Compo)	20	06/27/22 08 A	07/25/22 16	
	PAFF2130	Full Funding Approval EPAC Meeting (Compo)	0		08/03/22 16*	
	PAFF2210	Incorporate EPAC Full Funding PAF Review Comments (Compo)	5	08/04/22 08*	08/10/22 16	
EPAC-F	FF1620	Full Funding Approval (Compo)	0		08/12/22 16	
PPA-FF	FF1010	Full Funding PowerPlan Approval (Compo)	10	08/15/22 08	08/26/22 16	
CS00463.01.12 T-Minus Milestones			590	03/29/21 08 A	11/08/22 16	
CS00463.01.12.1 Electrical T-Minus Milestones			590	03/29/21 08 A	11/08/22 16	
	AT1805	N/R - T-18 NX-9 Rating to LCC + ISO for New 'T' Equipment (NC=Per Procedure/120 calendar days before DOE) (Compo)	0		03/29/21 08 A	
	AT0408	N/R - A-T-04.08 TCA (12C) Application Submitted (Compo)	0		03/29/21 08 A	
	AT3001	Engr Project Scoping Document Issued (Scope Lockdown) ** Re-instated **	0		05/26/21 16 A	
ENG-PREI	AT2605	Preliminary Design / Engineering Completed (Preliminary)	0		05/10/22 16 A	
TOA	AT0409	T-04 All Firm TOA Applications Due to LCC	0		06/06/22 16 A	
ENG-DTL	AT1811	Detail Design / Engineering Completed (Detail) - Electrical	0		07/25/22 16	
	AT0301	T-03 NX-9 Ratings to LCC & ISO for Existing Equipment (EM=Per Procedure/15 business days before DOE)	0		08/16/22 16*	
P&C-IFC	AT0805E	IFC - Electrical w/BOM	0		08/29/22 16	
CONSTSE	AT0814	Construction Contracts / PSA in Place	0		09/16/22 16	
	AT0203	Go / No-Go [CAN] Construction Authorization Notice Form Complete	0		09/30/22 16	
SOC	AT00	T-00 - Start of Construction (Compo) (Electrical)	0	10/31/22 08*		

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Activity Flag	Activity ID	Activity Name	At ɔmpletion Duration	Start	Finish	Resources
	AT0401	Final Material Receipt Review Completed *ES Purchased*	0		11/08/22 16	
CS00463.01.12.06 P&C T-Minus Milestones			175	05/09/22 08 A	10/31/22 08	
	BT2404	N/R_FTE / Determine / Assign Commissioning Engineer	0		05/09/22 08 A	
	BT1301	N/R_FTE_Commissioning Plan Complete	0		05/09/22 08 A	
ENG-PREI	BT2605	Preliminary Design / Engineering Completed (Preliminary)	0		05/10/22 16 A	
	BT0901	N/R_per P&C_T-09 Protection System Data - OP-24 Requirement (Tie to First Outage Milestone Phase)	0		06/14/22 16 A	
	BT1202	P/C Description / Draft OI Issued To LCC	0		07/25/22 16	
ENG-DTL	BT1811	Detail Design / Engineering Completed (Detail)	0		07/25/22 16	
P&C-IFC	BT0805P	IFC - P&C w/BOM	0		08/29/22 16	
	BT0404	All Final Relay Protective Settings Issued	0		08/29/22 16	
	BT0602	Units of Property (Items) Issued to Plant Accounting	0		08/29/22 16	
	BT0401	Final Material Receipt Review Completed *ES Purchased*	0		09/15/22 16	
	BT0203	Go / No-Go [CAN] Construction Authorization Notice Form Complete	0		09/30/22 16	
SOC	BT00	T-00 - Start of Construction (Compo) - P&C	0	10/31/22 08*		
CS00463.05 ENGINEERING & DESIGN			444	12/01/20 08 A	09/06/22 16	
CS00463.05.00 Engineering Services Staffing			307	12/01/20 08 A	02/22/22 16 A	[redacted]
	3370	Decision Required Regarding Engineering Staffing (ES, COC, BID) (Compo)	1	01/03/22 08 A	01/03/22 16 A	
CS00463.05.00.02 EOC - Engineer of Choice Process			307	12/01/20 08 A	02/22/22 16 A	
	EOC1140	Engineering of Choice (EOC) - Provide RFP to Single Vendor (Compo)	5	12/01/20 08 A	12/07/20 16 A	
	EOC1150	Engineering of Choice (EOC) - Vendor Responds with Proposal (Compo)	5	12/09/20 08 A	12/15/20 16 A	
	EOC1180	Engineering of Choice (EOC) - EOC Committee Reviews at Monthly Meeting & Approves (Compo)	1	02/22/22 08 A	02/22/22 16 A	
	EOC1200	Engineering of Choice (EOC) - DR Prepared by Project Engineer & Project Controls (Compo)	1	02/22/22 08 A	02/22/22 16 A	
	EOC1220	Engineering of Choice (EOC) - DR Approved & PO Issued for Vendor - Conceptual Design Effort (Compo)	1	02/22/22 08 A	02/22/22 16 A	
CS00463.05.06 P&C Engineering			82	05/11/22 08 A	09/06/22 16	
	OP1010	P&C Validation of PAF's Initial OP-24 Assessment NO GO (Compo)	1	06/06/22 08 A	06/06/22 16 A	
	OP1020	N/R_P&C Updates OP-24 Appendix B (Compo)	1	06/14/22 08 A	06/14/22 16 A	

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Activity Flag	Activity ID	Activity Name	At ɔmpletion Duration	Start	Finish	Resources
OP-24	OP1030	N/R_P&C Submits OP-24 Appendix B to ISO-NE (Compo) = No Go per P&C weekly sheet June 10	1	06/14/22 08 A	06/14/22 16 A	[redacted]
CASCADE	CSD1030	PE Initiate CASCADE Forms (Appendix A) for Construction Package (Compo)	5	08/30/22 08	09/06/22 16	
CS00463.05.06.01 P&C Engineering Detail Design			52	05/11/22 08 A	07/25/22 16	
V-DTL	PC1110	Vendor Engineer Develop P&C Detail Design (Compo)	44	05/11/22 08 A	07/11/22 16 A	
ES-DTL	PC1120	ES Engineering Review P&C Detail Design (Compo)	10	07/12/22 08 A	07/25/22 16	
CS00463.05.06.02 P&C Engineering IFC Design			50	06/20/22 08 A	08/29/22 16	
CS00463.05.06.02.03 P&C Design Package			25	07/26/22 08	08/29/22 16	
V-IFC	PC1320	Vendor Engineer Develop P&C IFC (Compo)	15	07/26/22 08	08/15/22 16	
ES-IFC	PC1330	ES Engineering Review P&C IFC (Compo)	10	08/16/22 08	08/29/22 16	
CS00463.05.06.02.01 Relay Settings			50	06/20/22 08 A	08/29/22 16	
V-RSET	PC1340	Vendor Engineer Develop IFR Relay Settings (Compo)	25	06/20/22 08 A	07/25/22 16	
ES-RSE	PC1350	ES Engineering Review IFR Relay Settings (Compo)	10	07/26/22 08	08/08/22 16	
ES-RSE	PC1410	Complete IFR Relay Settings (Compo)	15	08/09/22 08	08/29/22 16	
CS00463.05.03 Electrical Engineering			158	01/14/22 00 A	08/29/22 16	
CS00463.05.03.01 Electrical Engineering Detail Design			52	05/11/22 08 A	07/25/22 16	
V-DTL	A1130	Vendor Engineer Develop Electrical Detail Design (Compo)	42	05/11/22 08 A	07/11/22 16 A	
ES-DTL	A11405	Substation Engineering Review Electricial Detail Design (Compo)	10	07/12/22 08 A	07/25/22 16	
ES-DTL	A22710	Telecom Engineering Review Electricial Detail Design (Compc	10	07/12/22 08 A	07/25/22 16	
CS00463.05.03.02 Electrical Engineering IFC Design			25	07/26/22 08	08/29/22 16	
V-IFC	A8550	Vendor Engineer Develop Electrical IFC Design (Compo)	15	07/26/22 08	08/15/22 16	
ES-IFC RE	A8560	Substation Engineering Review Electrical IFC Design (Compc	10	08/16/22 08	08/29/22 16	
ES-IFC RE	A22720	Substation Engineering Review Electrical IFC Design (Compc	10	08/16/22 08	08/29/22 16	
CS00463.05.03.03 Substation NX-9			149	01/14/22 00 A	08/16/22 16	
	NX9A-EM220	N/R (per GB 14-1-22) LTRC Reviews and Makes "GO / NO-GO" Decision for 1-Line Nomenclature (Compo)	0	01/14/22 00 A	01/14/22 00 A	
	NX9A-EM230	N/R (per GB 14-1-22) PE Updates 1-Line Nomenclature Dwgs & Checklist M7-EN-3006.2 - e-mail link to project team & CONVEX	0	01/14/22 00 A	01/14/22 00 A	

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Activity Flag	Activity ID	Activity Name	At ompletion Duration	Start	Finish	Resources
	NX9A-EM240	N/R (per GB 14-1-22) P&C Develops and Provides LTRC with P&C Checklist (M7-EN-3006.1) (Compo)	0	01/14/22 00 A	01/14/22 00 A	[redacted]
	NX9A-EM260	N/R (per GB 14-1-22) LTRC Requests P&C Checklist (Comp	0	01/14/22 00 A	01/14/22 00 A	
	NX9A-EM320	N/R (per GB 14-1-22) LTRC Submits1-Line Nomenclature to TRC (Compo)	0	01/14/22 00 A	01/14/22 00 A	
	NX9A-EM310	N/R Scheduler @ NURS email "Submitted for DOE Monitoring" - Updates T-3, EquipDOE, Revs DOE per M7-EN-3006 (Compo)	0	01/19/22 08 A	01/19/22 08 A	
	NX9A-EM330	LTRC Reviews and Makes "GO / NO-GO" Decision for Thermal Ratings (Compo)	6	07/12/22 08 A	07/19/22 16	
	NX9A-EM300	LTRC Reviews and Sends Thermal Rating Data for TRC Review (Compo)	5	07/20/22 08	07/26/22 16	
	NX9A-EM290	TRC Reviews and Approves Thermal Rating Data (Compo)	5	07/27/22 08	08/02/22 16	
NX-9	NX9A-EM280	LTRC Sends Thermal Rating Data for Approval & Submit to NURS (Compo)	5	08/03/22 08	08/09/22 16	
	NX9A-EM250	TRC Review and Submit NX-9 Data to LCC + ISO-NE for S/S Thermal Rating (Compo)	5	08/10/22 08	08/16/22 16	
CS00463.05.03.03.01 Substation - NX-9 Pre NX9-DOE			0	01/19/22 08 A	01/19/22 08 A	
	NX9A120	N/R Scheduler - Send Email for 48Hrs Notification before DOE. (Compo)	0	01/19/22 08 A	01/19/22 08 A	
CS00463.05.03.03.02 Substation - NX-9 Post NX9-DOE/ISD			2	01/14/22 00 A	01/19/22 08 A	
	NX9FINAL70	N/R (per GB 14-1-22) [If Required] Receive + Issue Final Affirmed NX-9 Data to NURS (Compo)	0	01/14/22 00 A	01/14/22 00 A	
	NX9FINAL80	N/R Review + Affirm Accuracy of NX-9 for ISO Submission (Tie after Equip DOE or ISD) (Compo)	0	01/19/22 08 A	01/19/22 08 A	
CS00463.06 MATERIAL			74	07/26/22 08	11/08/22 16	
CS00463.06.02 Electrial Material			30	08/04/22 08	09/15/22 16	
CS00463.06.02.01 Electrical Material			30	08/04/22 08	09/15/22 16	
DR-RM	450	Issue DR for Cable / Wire (Compo)	5	08/04/22 08	08/10/22 16	
	460	Confirm PO Issed for Cable / Wire (Compo)	5	08/11/22 08	08/17/22 16	
DR-AGRM	480	Receive Cable / Wire	20	08/18/22 08	09/15/22 16	
CS00463.06.06 P&C Material			74	07/26/22 08	11/08/22 16	
CS00463.06.06.1 Relays			50	08/29/22 08	11/08/22 16	
DR-RM	380	Issue DR for Microprocessor Relays (stock coded) (Compo)	5	08/29/22 08	09/02/22 16	

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Activity Flag	Activity ID	Activity Name	At ɔmpletion Duration	Start	Finish	Resources
	390	Confirm PO Issed for Microprocessor Relays (stock coded) (Compo)	5	09/06/22 08	09/12/22 16	[redacted]
DR-AGRM	395	Receive Relays	40	09/13/22 08	11/08/22 16	
CS00463.06.06.4 Panels - Installed Pre-Wired Relays			63	07/26/22 08	10/24/22 16	
	420	Prepare & Approve SPEC (approx 4 weeks) (Compo)	5	07/26/22 08	08/01/22 16	
DR-RM	410	Issue DR for Relay Panel (Compo)	5	08/29/22 08	09/02/22 16	
	400	Confirms PO Issed for Relay Panel (Compo)	5	09/06/22 08	09/12/22 16	
	3380	Receive Pre-Wired Relay Panel	42	09/13/22 08	10/24/22 16	
CS00463.07 CONSTRUCTION			206	05/31/22 08 A	03/27/23 16	
CS00463.07.02 Electrical Construction			157	07/26/22 08	03/13/23 16	
CS00463.07.02.03 Equipment			90	10/31/22 08	03/13/23 16	
	A22540	Remove Existing Relays (Compo)	60	10/31/22 08	01/27/23 16	
	A22550	Install New Equipment (Compo)	90	10/31/22 08	03/13/23 16	
CS00463.07.02.05 Wiring / Terminating			90	10/31/22 08	03/13/23 16	
	A22570	Install Wiring (Compo)	90	10/31/22 08	03/13/23 16	
CS00463.07.02.06 Electrical Construction Service/Contracts			38	07/26/22 08	09/16/22 16	
	A21950	Prepare Specifications / Scope of Work (Electrical Contractor) (Compo)	2	07/26/22 08	07/27/22 16	
	A21960	Prepare and Issue RFP (Electrical Contractor) (Compo)	5	07/28/22 08	08/03/22 16	
	A21970	Bid Period (Electrical Contractor) (Compo)	10	08/04/22 08	08/17/22 16	
	A21980	Evaluate Bids and Develop Short List (Electrical Contractor) (Compo)	5	08/18/22 08	08/24/22 16	
	A21990	Negotiate Contract (Electrical Contractor) (Compo)	5	08/25/22 08	08/31/22 16	
	A22000	Award contracts for Civil construction and testing services (Electrical Contractor) (Compo)	1	09/01/22 08	09/01/22 16	
	A22010	Issue DR (Electrical Contractor) (Compo)	5	09/02/22 08	09/09/22 16	
	A22020	Issue PO (Electrical Contractor) (Compo)	5	09/12/22 08	09/16/22 16	
CS00463.07.06 P&C Construction			90	10/31/22 08	03/13/23 16	
	A1140	Construction - P&C Implement Relay Settings	90	10/31/22 08	03/13/23 16	
CS00463.07.92 CONSTRUCTION - CONST.REP TASKS			206	05/31/22 08 A	03/27/23 16	

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Activity Flag	Activity ID	Activity Name	At Completion Duration	Start	Finish	Resources
	A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage) (Compo)	5	05/31/22 08 A	06/06/22 16 A	[redacted]
	A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD) (Compo)	10	03/14/23 08	03/27/23 16	
CS00463.07.94	**CONSTRUCTION RESOURCE TRACKING**		90	10/31/22 08	03/13/23 16	
	ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP (Compo)	90	10/31/22 08	03/13/23 16	
	A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN (Compo)	90	10/31/22 08	03/13/23 16	
	A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT (Compo)	90	10/31/22 08	03/13/23 16	
	CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN (Compo)	90	10/31/22 08	03/13/23 16	
CS00463.07.96	**CONSTRUCTION OUTAGES**		119	09/19/22 08	03/13/23 16	
	A1170	Prepare CAN (Construction Authorization Notice) (Compo)	10	09/19/22 08	09/30/22 16	
CRH	CSM	Construction Start Milestone (Compo)	0	10/31/22 08		
	TOA2436	TOA#22-02436 Cutover and test operate temporary 23K-1X relay package.	1	11/01/22 08*	11/01/22 16	
	TOA2435	TOA#22-02435 Cutover and test operate temporary 23K-1X relay package. Replace backup and primary relays for the 23K-1X.	16	11/01/22 08*	11/16/22 16	
	TOA2438	TOA#22-02438 Cutover and test operate temporary 23K-2X relay package. Replace backup and primary relays for the 23K-2X.	1	11/28/22 08*	11/28/22 16	
	TOA2437	TOA#22-02437 Cutover and test operate temporary 23K-2X relay package. Replace backup and primary relays for the 23K-2X.	16	11/28/22 08*	12/13/22 16	
	CFM	Construction Finish Milestone (Compo)	0		03/13/23 16	
ISD	ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint) (Compo)	0		03/13/23 16*	
	TOA-Const70	OUTAGE / General Construction Work - Relays (Compo)	115	10/31/22 08	03/13/23 16	
CS00463.09	**TEST AND COMMISSION**		1	05/09/22 08 A	05/09/22 16 A	
CS00463.09.02	**LCE PLANNING**		1	05/09/22 08 A	05/09/22 16 A	
	A22580	PM to Request Lead Commissioning Engineer NO-GO, FTE to test	1	05/09/22 08 A	05/09/22 16 A	

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Activity Flag	Activity ID	Activity Name	At Completion Duration	Start	Finish	Resources
	A22590	N/R_Assign Lead Commissioning Engineer (Compo)	1	05/09/22 08 A	05/09/22 16 A	[redacted]
CS00463.09.01	TEST - SERVICES STAFFING DECISION		1	05/09/22 08 A	05/09/22 16 A	
	A1010	STAFFING DECISION: FET to test	1	05/09/22 08 A	05/09/22 16 A	
CS00463.10	PROJECT CLOSE OUT		117	03/14/23 08	08/25/23 16	
	TD1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List (Compo)	5	03/14/23 08	03/20/23 16	
V-FLDASB	PC8000	Prepare P&C Field Mark Ups (Compo)	21	03/21/23 08	04/18/23 16	
PM	PM1110	PM to Document Electrical As-Built Drawings Complete (P&C) (Compo)	1	07/14/23 08	07/14/23 16	
ES-FLSASB	EV1510	FE Files Substation Design Drawings at Station (Compo)	30	07/17/23 08	08/25/23 16	
ES-FLSASB	PC8500	FE Files P&C Design Drawings at Station (Compo)	30	07/17/23 08	08/25/23 16	
CS00463.10.03	P&C As-Builts		60	04/19/23 08	07/13/23 16	
ES-ASB	PC8510	Eversource Engineering Prepares & Sends Electrical Field Mark Up Packge to Vendor (Compo)	5	04/19/23 08	04/25/23 16	
V-ASB	PC8520	Vendor Engineering Verifies P&C Mark Ups and Updates As-Built Drawing Package. Submits Final Package to ES (Compo)	30	04/26/23 08	06/07/23 16	
ES-ASB	PC8530	Eversource Engineering Verifies Quality of Submitted P&C Drawings (Compo)	20	06/08/23 08	07/06/23 16	
ES-ASB	PC8540	P&C Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field (Compo)	5	07/07/23 08	07/13/23 16	
CS00463.10.04	Test Closout		5	03/14/23 08	03/20/23 16	
	3290	LCE Review Test Data and Issue Commissioning Report (tie to As-Built submit Print activity) (Compo)	5	03/14/23 08	03/20/23 16	
CS00463.10.05	SITE RESTORATION CLOSEOUT		10	03/14/23 08	03/27/23 16	
	1110	Restore / Remediate Site (Compo)	10	03/14/23 08	03/27/23 16	
CS00463.10.06	MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CL		40	03/14/23 08	05/08/23 16	
	1020	Cost Analyst Prepares FINAL Units of Property (Compo)	30	03/14/23 08	04/24/23 16	
	1030	Asset Management Complete Asset Update(s) in CASCADE (Compo)	30	03/28/23 08	05/08/23 16	
CS00463.10.07	PROJECT MANAGEMENT CLOSEOUT		117	03/14/23 08	08/25/23 16	
	1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc. (Compo)	30	03/14/23 08	04/24/23 16	

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Activity Flag	Activity ID	Activity Name	At Completion Duration	Start	Finish	Resources
	1270	Prepare TD-707 Document (Compo)	30	03/14/23 08	04/24/23 16	[redacted]
	FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE) (Compo)	0		08/25/23 16	

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EVERSOURCE

Constructability Review Form: **Substation**

Project Title: [redacted] **Obsolete Distribution Relay Replacement**	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS00463	**Project Constructability Phase:**	
Date(s) of Constructability Review: **04/29/2020** 05/18/2022	☐ Conceptual Engineering Design ☒ Preliminary Engineering Design ☐ Detailed Engineering Design	
Project Scope Statement: Replace aging and obsolete relays to improve reliability. The relays being replaced consist of (9) obsolete GEC KCGG model units which protect the 1X and 2X, Bus B1 and B2, and feeders 23K11, 16 and 17.		

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	Name
☐	☒	Project Management	[redacted]	☐	☐	S/S Engineering	[redacted]
☐	☐	Asset Management		☐	☒	P&C Engineering	
☐	☒	Constr. Management		☐	☐	Civil Engineering	
☐	☐	S/S Technical / LCE		☐	☐	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

[redacted] 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] _____ *5/18/22* _____

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	Lack of capacity during outages	Furnish and install temporary transformer relay protection
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	☐	The scope is to replace antiquated relay. This is a P&C only Project. No remote station impacts.

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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?	☐	Material was identified and ordered.
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..	☐	No impact to control house.
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	☐	Thermal rating shall be checked but just for verification.
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?	N/A	
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?	N/A	

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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.)	N/A	
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	N/A	
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	☐	Yes
10	BPS Separation Requirements - Is this BPS Substation? Y/N (part of PAF) - Changes to pre-existing BPS standards?	☐	Non BPS
11	IEC 61850 Substation Automation and Communication Requirements - Any Impacts/Retrofit needed?	N/A	
12	Any Upgrades to ES Standards - Is retrofit needed to bring up to ES standards? Can that be done?		*The new Relay being replaced will bring the Substation up to Eversource's present standard.*
B	**Construction**		
1	**Any safety hazards specific to the facility? i.e. Low Bus, Deterioration, etc.**	☐	none
2	**Prior known Site Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	☐	none
3	**Identify/Consider Required Depts for Construction?** -Who is constructor: Internal vs External Resources -S/S Ops, GO, Test, Field Engineering, etc -Specialty Contractors Required?	☐	Oversight needed by a CR, internal testing will support the project.

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
	-Required Oversite Needed - Estimated level of CR and LCE support needed		
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?	NA	
5	**Unique Equipment Considerations:** **Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser**	NA	

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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	☐	Clearances are being developed, working with the testing rep, outage coordinator.
7	**Equipment Testing & Acceptance** -Grounding plans / Resources? Will we need grounds hung? -Hi-pot testing and where will the equipment be set up?	NA	
8	Need for mobile generator and where connected (if needed)	☐	None needed
9	Need for mobile battery and where connected (if needed)	☐	None Needed
10	OT work required or Notable Permit Conditions (special hours)?	☐	
11	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	NA	
C	**Environmental**		
1	**Soil Pre-Characterization or Grab Sampling Completed/Planned**	NA	

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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	**Desktop investigation and EAD Review** -Required Permits -Stormwater Considerations -Dewatering requirements -Wetland and buffer review	NA	All work is within the control house, no environmental impacts are expected.
3	Risk or presence of PCB's/Asbestos/Lead/SF6		
4	Transformer Spill Containment Recommended?		
5	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)		
6	Environmental oversight considerations? (Inspection type/Interval)		
7	Environmental mitigations - Any matting or seasonal needs? Review D&M Plan with CR.		
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	NA	All work is within the control house.
2	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?		
3	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work		
4	Installation within Eversource Rights - Is Rights and Restrictions Review required?		
5	Expanding Footprint / New Buildings or future Expansion Plans?		
6	Proposed Equipment on same property? - Any Encroachments		
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	☐	NC

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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	Space on existing panels for new equipment? (front & rear of panel fronts)	☐	Space restraints require reuse of old transformer lockouts and fewer test switches for all new relay packages than standard.
3	Panel fronts conform to drawings	☐	Location of 43ACO/94T to be updated in panel drawings to reflect actual position
4	Access to bring new panels into control enclosure	☐	NA
5	Nameplate list and location of nameplates	☐	NC
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	☐	NC
7	Temporary protection, relays, control cable needed? How long will they be required?	☐	Temporary settings will be issued for a temporary overcurrent relay installed during transformer outages to allow for fast restoration in the event the transformer is needed.
8	Will relay setting changes be needed? Any additional outage requirements for changes?		Several existing and all new relay packages will require settings.
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	NA	No Telecom engineering required
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.		
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.		
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.		
5	Review and list any remote station impacts/updates		
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination		
7	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed		
8	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	NA	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
9	Review third party Telecommunications at substation and confirm whether additional capacity or Ground Potential Rise protection is required	N	

Photos

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

23k-1X3-B1-2 Panel (Front, Upper)	23K-1X3-B1-2 (Front, Lower)
	

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Constructability Review Form: **Substation**

23K 17-2 (Front, Upper)	23K 17-2 (Front, Lower)
[redacted]	
52/11F FEEDER BREAKER 23K 11-2 (Front, Upper)	52/11F FEEDER BREAKER 23K 11-2 (Front, Lower)
[redacted]	

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Constructability Review Form: **Substation**

52/14F FEEDER BREAKER 23K 14-2 (Front, Upper)	52/14F FEEDER BREAKER 23K 14-2 (Front, Lower)
[redacted]	
52/2XB Transf. Breaker B4 - 23K-2X3-B2-2 (Ft, Upper)	52/2XB Trans. Breaker B4 - 23K-2X3-B2-2 (Front, Lower)
[redacted]	