EVERSOURCE

Operations Project Authorization Form

Approved on September 26, 2024 EPAC

Link to Meeting Minutes

Project Title: [redacted] **SS Oil Recloser Replacement**	**Project Number: CS00630**
Date Prepared: 09/16/2024	**Company: Eversource CT**
Organization: Asset Management	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Switches**
Managing Organization: Project Mgt and Construction	**Schedule ID#: 80785338**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Capital Investment part of original Op Plan: Yes**
Estimated in service date: December 2024	**Emergency Related Request? No**
Eng./Constr. Resources Budgeted? Yes	**Facility Type (check all that apply):** ☐ **PTF** ☐ **non-PTF** ☐ **local PTF** ☒ **Distribution** ☐ **N/A (General Plant)**
EJ Community: No	**Authorization Type: Full Funding**
Total Capital Request: $727K	

[1] Executive Summary

This Project Authorization Form (PAF) is requesting full funding in the amount of $727K to [redacted] CT. [redacted]

The primary driver for this project is to support distribution overhead line reliability projects CD01634 "[redacted] TDRP 2020" (Reference 1) and CD01636 "[redacted] 2020 TDRP" (Reference 2). These two distribution line projects aim to improve reliability on the [redacted] circuits which originate at [redacted]. As part of these reliability improvements, the [redacted] reclosers will need Loop Scheme (LS) functionality enabled, which the existing units cannot support. Replacement of the existing reclosers is required in order to install new units capable of supporting LS controls.

Secondary drivers for CS00630 include the replacement of OFRs across Eversource's (ES) system for environmental benefits and due to asset age. The two existing reclosers [redacted] and [redacted] are 27kV Cooper WVE27 OFRs, both installed in 2005 and manufactured in 2000 (24 years old). These units are approaching their expected lifespan of 20-30 years as outlined by Eversource Recloser Asset Strategy Document RF-AS-1901 and are recommended to be replaced (Reference 3). Additionally, as part of Eversource's commitment to reduce environmental risks, OFRs are being replaced across distribution substations with non-oil alternatives. Replacement of these units will reduce environmental risks associated with potential oil leaks. The reclosers at [redacted]

This project was previously approved in PowerPlan for $100K of initial funding on September 11, 2023 (Reference 4). As of August 2024, funds have been allocated to engineering through preliminary design, site walkdowns, project management, schedule creation, and associated support to reach full funding.

This project was approved at the Solution Design Committee (SDC) on August 29, 2024 (Reference 5).

[redacted] is not located within an Environment Justice (EJ) community block.

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[2] Project Costs Summary

Note: Dollar values are in thousands and rounded to nearest thousand

Line item Category	Prior Authorized	Actuals to Date	2024 to Go	2025	2026	Total Request
1. ROW / Easements / Land Acquisition	$	$	$	$	$	$
2. Environmental Approvals / Permits	$	$	$	$	$	$
3. Outreach	$	$	$1	$	$	$1
4. Siting Approvals / Permits	$	$	$2	$	$	$2
5. Engineering / Design	$	$67	$37	$	$	$104
6. Materials (Eversource purchased)	$	$	$93	$	$	$93
7. Construction (incl materials by contractors)	$	$4	$101	$	$	$105
8. Testing / Commissioning	$	$	$19	$	$	$19
9. Project Mgmt. Team	$	$17	$41	$	$	$57
10. Removals	$	$1	$6	$	$	$7
11. Other	$	$3	$4	$	$	$7
12. Risks	$	$	$47	$	$	$47
SUBTOTAL DIRECTS W/ RISKS	**$100**	**$92**	**$350**	**$**	**$**	**$442**
13. Indirects/Overhead	$	$91	$147	$	$	$257
14. AFUDC	$	$5	$23	$	$	$28
PROJECT TOTAL – BASELINE BUDGET	**$100**	**$187**	**$520**	**$**	**$**	**$707**
15. Contingency	$	$	$19	$	$	$19
TOTAL CAPITAL REQUEST	**$100**	**$187**	**$539**	**$**	**$**	**$727**
16. Reimbursables/Customer Contribution	$	$	$	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$100**	**$187**	**$539**	**$**	**$**	**$727**
O&M	$	$	$	$	$	$
TOTAL REQUEST	**$100**	**$187**	**$539**	**$**	**$**	**$727**

Detail other costs, project risk items and their allocations:

Risk	Allocation
Other Costs (taxes, journaled charges)	$7K
Risk - Engineering - Elec. - Station	$10K
Risk - ES Materials - Material / Vendor costs	$9K
Risk - Construction - Outage impacts	$7K
Risk - Construction - Labor costs impact	$6K
Risk - Construction - Design / Scope changes	$5K
Risk - Construction - Weather delays impact	$7K
Risk - Construction - Rock Excavation impact	$3K
Total Risk	$47K

Charges in the "Other" category are related to Sales & Use Tax associated with ordering material, various insurance costs, and minimal charges journaled over from a previous work order (see "Background" for additional information).

Explain unique payment provisions, if applicable:

The NOVA reclosers represent a long lead time material & were ordered in July 2023 through the Material Exemption Form process.

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

N/A.

[3] Technical Justification

Project Need, Objective and Justification

CS00630 is driven by reliability and asset condition needs.

Distribution Line Reliability:

Work at CS00630 will directly support the completion of Distribution Line projects CD01636 Columbia 20Y2 2020 TDRP and CD01634 Columbia 20Y1 TDRP 2020.

Projects CD01634 & CD01634 are to improve reliability on the [redacted] circuits originating from [redacted], respectively. The objectives of these projects are to reconductor portions of the [redacted] and [redacted] The reclosers do not have these controls and cannot support the installation of these controls.

This project CS00630 will install new reclosers with loop scheme controls to support reliability projects CD01636 and CD01634.

Asset Condition:

[redacted] substation is currently equipped with OFRs. These units have the potential for oil leaks or spills in the event of equipment failure. As part of Eversource's goal to reduce environmental risks of oil spills, these units will be replaced with vacuum-interrupting reclosers, which do not contain oil, to eliminate the risk of any oil leakage incidents and environmental cleanups.

Additionally, the [redacted] will modernize the equipment to current Eversource standards.

Project Scope

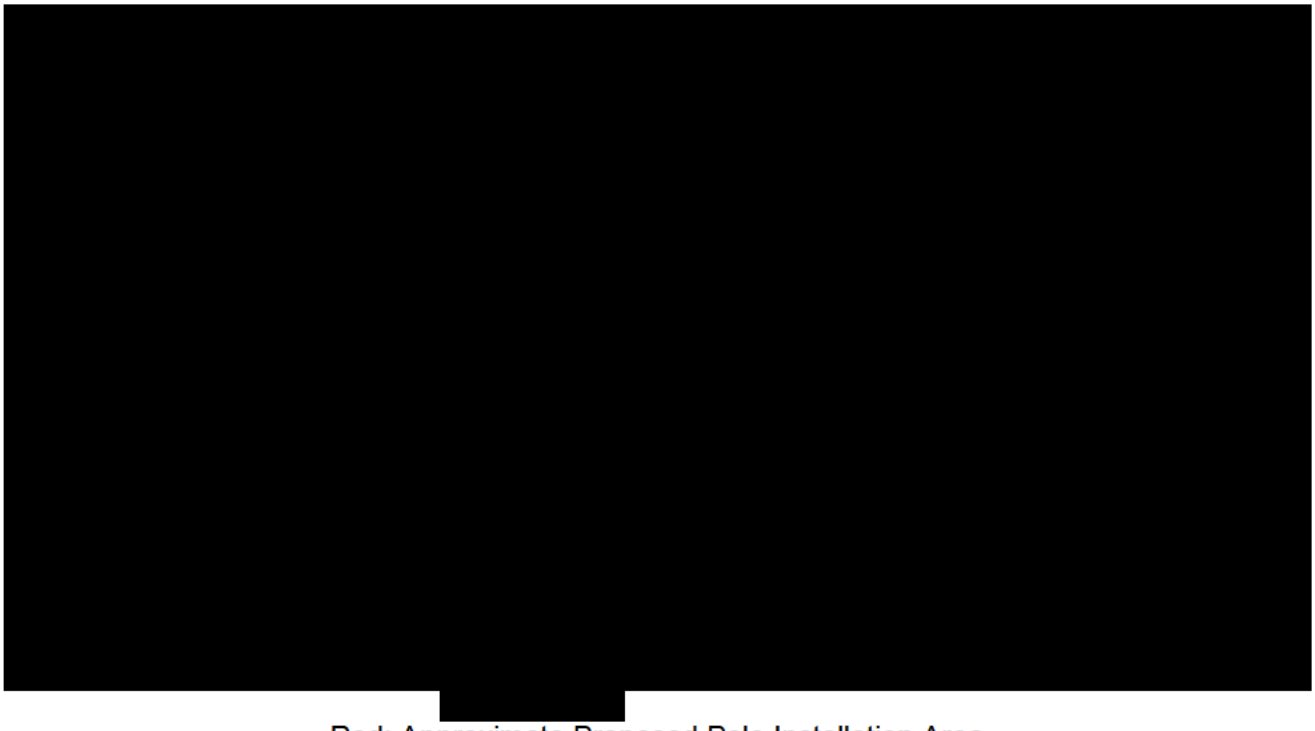
[redacted] Attachment D outlines the current station nomenclature.

The scope of CS00630 is to replace the two (2) oil-filled reclosers [redacted] with new [redacted]

[redacted] Figures 1 & 2 illustrate the approximate location of pole installation. [redacted]

[redacted]

Red: Substation Fence Line. Green: Approximate Proposed Pole Installation Area.



Red: Approximate Proposed Pole Installation Area.

Electrical Construction:

Eversource crews will take a one (1) day outage to perform recloser installation. Fully dressed

Electrical Removals:

the existing OFRs and their junction boxes will be removed. Foundations for the old OFRs, existing disconnect switches, and all other bus equipment will remain.

P&C Updates:

Substation Equipment *(use as applicable, delete if N/A)*

Station	Device Position / Nomenclature	Device Removals *include manufacturer*	Device Additions *include manufacturer*
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]		[redacted]	[redacted]

A Constructability Review was performed on August 12th, 2024 (Attachment C).

Background

Work for this project initially began under CS00570 SS Oil Recloser Replacement (Reference 6), a program designed to replace OFRs across CT distribution substations. However, as the scope of the project CS00630 was further finalized, the addition of loop scheme controls & the needs presented by Distribution Line projects CD01634 and CD01636 motivated the decision for CS00630 to be split from the program to become its own specific project. Minimal charges were journaled from the previous work order 80281219 under program CS00570 to this project CS00630, and the previous work order was closed.

Initial Approach: Substation Stand Solution

Initial funding dollars were used to conduct site walkdowns in Winter 2023 and Spring 2024 to pursue the solution of replacing existing OFRs with new vacuum reclosers placed on substation stands, which is the solution used for similar OFR replacement projects as outlined in CS00570. As the civil design for this solution progressed, it was identified that existing civil drawings of the site were missing information on underground footings and their size. Verification work was required to confirm the existence and size of these footings before a decision could be made to keep or replace the existing recloser foundations for OFR replacement. This verification was performed by contractor crews, who visited the site in early June 2024 to perform test digs under the supervision of Eversource civil engineers. Figure 3 illustrates the test dig results.



Figure 3. Test pit dug at [redacted] in June 2024 to verify foundation depth & presence of footing.

After civil verification work was completed, design work proceeded. As engineering design approached preliminary design completion, it was discovered that concerns regarding customer reliability on the outgoing [redacted] circuits would prevent the project from being able to take its proposed two (2) week outage unless a mobile transformer were to be installed during construction. It was determined that the risk and duration of power loss would be too great if a two-week outage were to be taken. This addition of a mobile transformer to the scope represented a significant cost increase (final cost outlined under “Alternatives Considered”) and merited the evaluation of alternative solutions.

Final Approach: Pole Top Solution

Discussion with Field Operations, Distribution Engineering, Substation Operations, Substation Engineering, and the circuit owner resulted in the solution of installing two (2) new distribution poles within the substation fence line, on which the new reclosers would be installed. This arrangement would allow for Field Operations crews to install the reclosers over a single-day outage as opposed to a two-week outage, eliminating the need to install a mobile transformer and significantly reducing overall construction time.

Additional site visits were conducted throughout Spring and Summer 2024 to validate this solution under initial funding dollars. Engineering work was also performed to bring this solution to a preliminary level design.

[4] Alternatives Considered

CS00630 was approved at the Solution Design Committee on August 29, 2024.

Alternative: Do Nothing (Maintain Existing Reclosers)

This solution is not an option as it leaves oil-filled equipment active and in-service and does not meet Eversource's goal of removing oil-filled equipment from the substation system. This option also fails to update the reclosers to loop scheme functionality and does not support the completion of distribution line projects CD01634 and CD01636.

Estimated Cost: $0

Alternative: Install Substation-Stand Reclosers

This alternative replaces the existing substation reclosers with new [redacted] placed on new substation stands, to be installed upon the existing recloser foundations. [redacted] Existing reclosers will be removed & scrapped. A mobile transformer will be installed during construction to assist with outage needs. Outages will last approximately two weeks.

This alternative reduces Eversource's environmental liabilities by eliminating oil-filled equipment on the system and improves customer reliability by supporting CD01636 and CD01634. This alternative was not chosen due to the higher cost & extended construction & outage times required.

Estimated Cost (Conceptual Grade Estimate): $955K

Preferred Alternative: Install Pole-Top Reclosers

This alternative replaces the existing substation reclosers with new [redacted] Existing reclosers will be removed and scrapped. A one (1) day outage will be taken to install new reclosers.

This alternative reduces Eversource's environmental liabilities by eliminating oil-filled equipment on the system and improves customer reliability by supporting CD01636 and CD01634. This alternative was chosen based on construction, outage time, and cost efficiencies.

Estimated Cost (Planning Grade Estimate, Attachment A): $727K

[5] Project Schedule

Milestone	Scheduled Completion Date
IFR Approval	September 2023
SDC Approval (for applicable projects)	August 2024
Conversion of Tx development costs, 183 to 107 (applicable to projects that require SSF approval and/or ISO preferred alternative selection)	N/A
EPAC Partial Funding Approval (for applicable projects)	N/A
Preliminary Design Completion (or latest pre-full funding design phase)	August 2024
EPAC Full Funding Approval	October 2024
Siting Approval (for applicable projects)	N/A
Start of Construction	October 2024
Project In-Service Date (ISD)	December 2024
Project Need Date (for applicable projects)	N/A
ISO Related Milestones: (for applicable projects)	
• ISO Preferred Alternative Selected	N/A
• PAC Presentation	N/A
• TCA Submittal	N/A

Please consult the P6 schedule (Attachment B) for additional details.

[6] Regulatory Approvals

There are no regulatory approvals associated with this project.

EJ Community Considerations:

N/A. This project is not located in an environmental justice community block.

[7] Risk and Risk Mitigation Plans

Contingency:

$19K has been allocated to account for project unknowns.

Risk Mitigation:

Risk	Mitigation
Risk - Engineering - Elec. - Station	This risk includes additional engineering work required prior to construction. Design is nearing the IFC stage and engineering teams have coordinated with Field and Substation Operations to validate needs and minimize risk of additional scope.
Risk - ES Materials - Material / Vendor costs	This risk includes additional material or vendor costs, potentially driven by inflation/etc. Order long-lead-time materials in advance and ensure that material is in stock prior to the start of construction.
Risk - Construction - Outage impacts	This risk includes additional impacts from outages during construction. Track schedule to minimize outage duration and avoid construction delays.
Risk - Construction - Design / Scope changes	This risk includes design or scope changes required due to unforeseen complications or obstacles identified during construction. Maintain oversight of all construction activities through project management and schedule. On-site digging was performed in June 2024 to verify civil drawings & confirm absence of unexpected underground obstructions.
Risk - Construction - Weather delays impact	This risk represents delays to construction due to weather. Track weather patterns and site preparation/planning to perform work in a timely fashion.
Risk - Construction - Labor costs impact	This risk involves additional labor costs. Track schedule to avoid construction delays. Maintain oversight of all construction activities through project management and schedule.
Risk - Construction - Rock Excavation impact	This risk represents the possibility of encountering hard rock while excavating holes for the new distribution poles. Field Operations identified this risk during the Constructability Walkdown and has dedicated vendors on-hand to provide drilling services, as necessary.
Total	

[8] References

References
1. CD01634 [redacted] TDRP 2020. PAF. Approved in PowerPlan 10/16/2023.
2. CD01636 [redacted] 2020 TDRP. PAF. Approved in PowerPlan 10/16/2023.
3. RF-AS-9101 Substation Recloser Strategy Doc Rev0, In Approval Process.
4. CS00630 [redacted] SS Oil Recloser Replacement IFR. Approved in PowerPlan 9/11/2023.
5. CS00630 [redacted] SS Oil Recloser Replacement SSF. Approved at SD 8/29/2024.
6. CS00570 (CT), 22218 (EMA), A22X42 (NH), WS00131 (WMA) – SS Oil Recloser Replacement Program IFR. Approved in PowerPlan on 3/4/2022.

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

Attachment	Included in Submittal?
A. Cost Estimate: ESF - [redacted] SS Oil Recloser r2 EXT	*YES*
B. P6 Schedule: P6 [redacted] SS Oil Recloser 9.6.24	*YES*
C. Constructability Review: CS00630 [redacted] Constructability Review	*YES*
D. System and Station One-Lines: [redacted] One-Line	*YES*

Project Checklist - Transmission & Substation Capital Project		
Project Name: [redacted] **SS Oil Recloser Replacement**		**Project Number: CS00630**
Facility Type: ☐BPS ☐BES ☐PTF ☐local PTF ☐non-PTF ☐CIP ☒Distribution ☐General Plant ☐CONVEX ☐SCADA		
PLANNING		
Is a NX-9 required?	No	
Is an ISO-NE PAC presentation required?	No	
ISO-NE Presentation Date (if completed):	N/A	
Cost in ISO-NE Presentation ($M) (if completed):	N/A	
Is a PPA required?	No	
ISO-NE Approval Date (if completed):	N/A	
Is a TCA Application Required?	No	
TCA Submittal Date (if submitted):	N/A	
Cost in TCA Submittal ($M) (if submitted):	N/A	
Enter ISO-NE RSP / Asset Condition ID, if assigned:	N/A	
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	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?	NR	

Project Checklist - Transmission & Substation Capital Project		
Project Name: [redacted] **SS Oil Recloser Replacement**		**Project Number: CS00630**
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		
Has Siting reviewed this project?	No	
Name of Siting contact:	N/A	
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		
Has Project Services reviewed this project?	No	Choose an item
Name of Project Services contact:	N/A	
What is the level of outreach expected?	None	
Has ROW Coordination reviewed this project?	No	
Is this project coordinating with other existing scheduled work?	No	
ENVIRONMENTAL JUSTICE COMMUNITIES		
Has the Equity and Environmental Justice team reviewed this project?	N/A	
Name of Equity and Environmental Justice contact:	N/A	
Is any part of this project in an Environmental Justice Community?	No	
Was the Equity Framework Checklist completed?	N/A	
Has enhanced outreach required per State Regulatory requirements been completed?	N/A	
INITIATOR		
Has a field constructability review been completed?	Yes	

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] **SS Oil Recloser Replacement**	**Project Number: CS00630**
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 the Eversource Estimating Team
Name of the person who prepared the estimate:	[redacted]
Was the estimate reviewed by Eversource Estimating?	Yes - Full Review

Return to TOC

Project name [redacted] **SS Oil Recloser**
Project no **CS00630**
Project manager
Project estimator [redacted]

Est accuracy **Planning (-25% to +25%)**
Ext accuracy
State **CT**
Business unit **Distribution**

Description	% Directs	% Total	[redacted] SS Oil Recloser Replacement
ROW / Easements / Land purchases	0.0%	0.0%	-
Environmental Approvals / Permits	0.0%	0.0%	-
Outreach	0.2%	0.1%	700
Siting Approvals / Permits	0.5%	0.3%	2,000
Engineering / Design	23.6%	14.3%	104,300
Materials (Eversource purchased)	21.1%	12.8%	93,300
Construction (inc contractor sourced material)	23.7%	14.4%	104,900
Testing / Commissioning	4.3%	2.6%	19,100
PMT Project Mgmt Team	13.0%	7.9%	57,500
Removals	1.6%	0.9%	6,900
Other	1.6%	1.0%	7,000
Risks	10.6%	6.4%	46,800
Project Directs (including risks)	**100.0%**	**60.9%**	**442,500**
Indirects/Overhead		32.6%	237,100
AFUDC		3.8%	27,900
Project Total - Baseline Budget		**97.3%**	**707,500**
Contingency		2.7%	19,400
Project Total - Approval Level		**100.0%**	**726,900**
Reimbursables/Customer Contribution		0.0%	-
Project Total (less reimbursables)			**726,900**

Metrics	
	1 LS
	726,900 $/LS
Escalation (included above)	3,400
Miscellaneous	
Risks & Contingency / Project Total - Approval level (less Risks & Contingency)	10.02%
	Planning (-25% to +25%)
Estimate Range	
Low	545,200
Expected	726,900
High	908,600

Return to TOC

CBS1 > 2 > 3 > 4	Description	Total Amount	Actual Amount	Labor Hours	Labor Amount	Material Amount	Subcontract Amount	Equipment Amount	Other Amount
[redacted]	SS Oil Recloser Replacement	726,792	187,433	[redacted]	191,470	98,076	-	7,091	242,722
03	SCS Outreach	715	-	[redacted]	[redacted]	-	-	-	-
04	Siting Approvals / Permits	1,968	-	[redacted]	[redacted]	-	-	-	-
05	Engineering / Design	104,258	66,831	[redacted]	[redacted]	-	-	-	-
06	Equipment /Materials (Eversource purchased)	93,339	-	[redacted]	[redacted]	[redacted]	-	-	-
07	Construction (incl matl's by contractors)	104,943	4,046	[redacted]	[redacted]	[redacted]	-	[redacted]	-
08	Testing / Commissioning	19,117	-	[redacted]	[redacted]	-	-	-	-
09	PMT Project Mgmt Team	57,465	16,819	[redacted]	[redacted]	-	-	-	-
10	Removals	6,858	1,240	[redacted]	[redacted]	-	-	[redacted]	3,090
11	Other	6,967	3,142	[redacted]	-	-	-	-	3,825
12	Risks	46,800	-	[redacted]	-	-	-	-	46,800
13	Indirects/Overhead	237,099	90,596	[redacted]	-	-	-	-	146,503
14	AFUDC	27,863	4,759	[redacted]	-	-	-	-	23,104
15	Contingency	19,400	-	[redacted]	-	-	-	-	19,400
Grand Total		726,792	187,433	[redacted]	191,470	98,076	-	7,091	242,722

Activity ID	Activity Name	Start	Finish	Resources	Predecessors	Successors
[redacted] S/S Oil Recloser		10-Jul-23 A	03-Mar-25			
SS Oil Recloser [redacted] CS00630		10-Jul-23 A	03-Mar-25			
PT1000	Project Timeline	10-Jul-23 A	03-Mar-25			
PROJECT PLANNING & FUNDING		25-Sep-23 A	30-Dec-24			
PPF1000	Project Planning & Funding	25-Sep-23 A	30-Dec-24			
T-Minus Milestones		27-Sep-24	30-Dec-24			
Civil T-Minus Milestones		27-Sep-24	18-Nov-24			
BT0203	CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)		27-Sep-24		A1170	BT00
BT00	B-T-00 - START OF CIVIL CONSTRUCTION - WO#	21-Oct-24*			BT2605, BT1811, BT0401, BT0203, BT0805C	CSM, A1120
BT0401	ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED		18-Nov-24		DSSE-1130	BT00
Electrical T-Milestones		27-Sep-24	30-Dec-24			
AT0203	CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)		27-Sep-24		A1170	AT00
AT0401	ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED		19-Oct-24		DSSE-1220, DSSE-205	AT00
AT00	A-T-00 - START OF ELECTRICAL CONSTRUCTION - WO#	21-Oct-24*			AT0805, AT1811, AT3001, AT2605, AT0805P, AT020	OUTAGE 22-XXXX1
AT0409	ALL FIRM TOA APPLICATIONS DUE TO LCC (for DISTRIBUTION Non-transformer equipment)		30-Dec-24		A1250	AT00
Project Funding		19-Aug-24 A	28-Oct-24			
Full Funding		19-Aug-24 A	28-Oct-24			
EPAC - FF		19-Aug-24 A	11-Oct-24			
PAFF2000	Submit Full Funding PAF for Internal Review	19-Aug-24 A	16-Sep-24	[redacted]	DE1600, DE2010	PAFF2100
PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review	17-Sep-24	25-Sep-24	[redacted]	PAFF2000	PAFF2110
PAFF2110	EPAC Full Funding Meeting		26-Sep-24*		PAFF2100	PAFF2200
PAFF2200	Incorporate EPAC Full Funding PAF Review Comments	27-Sep-24	10-Oct-24	[redacted]	PAFF2110	FF1000
FF1000	EPAC Full Funding Approval	11-Oct-24	11-Oct-24	Eversource Project Appr	PAFF2200	FF1010
Power Plan - FF		15-Oct-24	28-Oct-24			
FF1010	Full Funding PowerPlan Approval	15-Oct-24	28-Oct-24	Eversource Project Appr	FF1000	A3540, A3500, DSSE-1150, [
Project Management		16-Sep-24	30-Dec-24			
Compliance Authorization Notification		16-Sep-24	27-Sep-24			
A1170	Prepare CAN (Construction Authorization Notice)	16-Sep-24*	27-Sep-24	[redacted]	DSSE-240, DSSE-120	BT0203, AT0203
Outage Permits / TOAs Request		02-Dec-24	30-Dec-24			
A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage)	02-Dec-24*	30-Dec-24	TBD	PE1400, PE1100, PE1000	AT0409
PROCUREMENT LONG LEAD MATERIAL		10-Jul-23 A	19-Oct-24			
PLLM1000	Procurement Long Lead Material	10-Jul-23 A	19-Oct-24	Purchasing Department		
Electrical Long Lead Material		18-Oct-24	19-Oct-24			
MATERIAL FOR CONTROLLER		18-Oct-24	19-Oct-24			
DSSE-1220	MATERIAL - Electrical - UNIT -Confirm Material Delivery to Site	18-Oct-24*	19-Oct-24	TBD	DSSE-1210	AT0401
PROCUREMENT MATERIAL - BALANCE OF MATERIAL		29-Oct-24	18-Nov-24			
PBOM1000	Procurement Material - Balance of Material	29-Oct-24	18-Nov-24			
Civil Balance of Material		29-Oct-24	18-Nov-24			
DSSE-1140	MATERIAL - CIVIL - UG CONDUIT - Prepare & Issue DR	29-Oct-24	04-Nov-24	[redacted]	DSSE-110, FF1010	DSSE-1170, DSSE-1150
DSSE-1170	Civil (BG) - MISCELLENEOUS - Material Ordered	29-Oct-24	04-Nov-24	[redacted]	DSSE-1140	DSSE-1150
DSSE-1150	MATERIAL - CIVIL - MISCELLENEOUS - Procurement Issue PO	05-Nov-24	12-Nov-24	Purchasing Department	FF1010, DSSE-1170, DSSE-1140	DSSE-1160
DSSE-1160	MATERIAL - CIVIL - MISCELLENEOUS - Material Vendor Delivery Leadtime	13-Nov-24	17-Nov-24	Purchasing Department	DSSE-1150	DSSE-1130
DSSE-1130	MATERIAL - CIVIL - MISCELLENEOUS - Confirm Material Delivery to Site	18-Nov-24	18-Nov-24	TBD	DSSE-1160	BT0401
CONSTRUCTION		21-Oct-24	23-Dec-24			
CSM	Construction Start	21-Oct-24			BT00	LCE610, CONSTelec, ConRe
CFM	Construction Finish Milestone		23-Dec-24*		CONSTelec, A1080, OUTAGE 22-XXXX1, ConRep-S	FINISH, A1020, A1030, A104
ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)		23-Dec-24*		CFM, CSM	DSSE-960
Outages		08-Nov-24	17-Dec-24			

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Activity ID	Activity Name	Start	Finish	Resources	Predecessors	Successors
OUTAGE 22-XXXX1	Construction - Electrical - OUTAGE 1	08-Nov-24*	17-Dec-24	TBD	A1120, AT00	A1070, A1080, DSSE-820, OI
Construction Support LOEs		21-Oct-24	23-Dec-24			
A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION OUTAGE 1 - SWITCH OUT	08-Nov-24	08-Nov-24	Distribution Switching Cr	OUTAGE 22-XXXX1	CFM
A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION OUTAGE 1 - SWITCH IN	17-Dec-24	17-Dec-24	Distribution Switching Cr	OUTAGE 22-XXXX1	CFM
ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	21-Oct-24	23-Dec-24	TBD	CSM, OUTAGE 22-XXXX1	CFM
CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	21-Oct-24	23-Dec-24	Distribution - S/S Electric	CSM	CFM
Site Development		21-Oct-24	07-Nov-24			
A1120	Construction - Prep Work	21-Oct-24	07-Nov-24	TBD	BT00	OUTAGE 22-XXXX1, DSSE-9
PROJECT CLOSE OUT		24-Dec-24	03-Mar-25			
PCO1000	Project Close Out	24-Dec-24	03-Mar-25		LCE620	
Civil Close Out		24-Dec-24	03-Mar-25			
DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	24-Dec-24	26-Dec-24	TBD	A1120, CFM	DSSE-860
DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	02-Jan-25	15-Jan-25	[redacted]	DSSE-1100, DSSE-900	DSSE-970
DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	16-Jan-25	21-Jan-25		DSSE-860	DSSE-870
DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	22-Jan-25	31-Jan-25		DSSE-970	DSSE-1120, DSSE-880
DSSE-880	PM to Document Civil As-Built Drawings Complete	03-Feb-25	03-Feb-25		DSSE-870	FINISH
DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	03-Feb-25	03-Mar-25		DSSE-870	FINISH
Electrical Close Out		02-Jan-25	03-Mar-25			
DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	02-Jan-25	15-Jan-25	[redacted]	OUTAGE 22-XXXX3, OUTAGE 22-XXXX2, OUTAGE	DSSE-940
DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	16-Jan-25	21-Jan-25		DSSE-820	DSSE-830
DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	22-Jan-25	31-Jan-25		DSSE-950, DSSE-940, DSSE-960	DSSE-1110, DSSE-840
DSSE-840	PM to Document Electrical As-Built Drawings Complete	03-Feb-25	03-Feb-25		DSSE-830	FINISH
DSSE-1110	Complete TD-176 Electrical Design Prep & Issue As-Built Dwgs	03-Feb-25	03-Mar-25		DSSE-830	FINISH
P&C Close Out		24-Dec-24	08-Jan-25			
DSSE-960	P&C Submits Relay Setting As-Builts	24-Dec-24	31-Dec-24	[redacted]	ISD	DSSE-830
DSSE-950	P&C Submits SDS As-Builts	02-Jan-25	08-Jan-25		DSSE-1100	DSSE-830
Work Order / Financial Close Out		24-Dec-24	21-Feb-25			
A1020	Cost Analyst Prepares FINAL Units of Property	24-Dec-24	06-Feb-25	[redacted]	CFM	FINISH
A1030	Asset Management Complete Asset Update(s) in CASCADE	09-Jan-25	21-Feb-25		A1260, CFM	FINISH
Project Management Close Out		24-Dec-24	03-Mar-25			
DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	24-Dec-24	31-Dec-24	TBD, [redacted]	CFM	DSSE-820, DSSE-860, DSSE
A1110	Restore / Remediate Site	24-Dec-24	08-Jan-25	TBD	CFM	FINISH
A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	24-Dec-24	08-Jan-25	TBD	CFM	A1030
A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	24-Dec-24	06-Feb-25	[redacted]	CFM	FINISH
FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)		03-Mar-25		CFM, A1020, DSSE-840, DSSE-1120, A1040, A111	

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Substation Constructability Review

Project Title: [redacted] **SS Oil Recloser Replacement**	☒	Prior Constructability Review Performed?
	☐	Program Related Site-Specific Review?
Project Numbers(s): CS00630	**Project Constructability Phase:**	
Date(s) of Constructability Review: **08/12/2024**	☐ Conceptual Engineering Design	
Click to enter a date	☒ Preliminary Engineering Design	
	☐ Detailed Engineering Design	

Project Scope Statement: Replace two (2) existing oil-filled reclosers [redacted] with new 27kV NOVA vacuum interrupting reclosers with Loop Scheme (LS) controls. DSCADA functionality will be added. Reclosers will be installed as pole-top units on new distribution-style poles, to be located within the substation. Conduit will be run from the poles to the DSCADA cabinet.

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 Field Operations		☐	☐	Real Estate	
☐	☐	Line Engineering		☐	☐	ROW T&D Rights & Survey	
☐	☐	Vegetation Management		☐	☐	Survey Engineering	
☐	☐	Siting		☐	☐	Cost Estimating	
☐	☐	Safety		☐	☐	Project Services (Outreach)	
☐	☒	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:

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

[redacted] [redacted] 09/11/2024

Name / Signature *Date*

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		

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	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	☐	Completion of CS00630 necessary for the completion of CD1634 and CD1636. Planned coordination for October 2024 construction start date.
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?	☐	Pole-top reclosers are in stock. Poles are in stock. Conduit is in stock. Recloser controls will be taken from previously ordered yet unused substation-stand-style NOVA 27kV units.
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...	N/A	
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	N/A	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
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?		Underground hard rock may be encountered at the dig location of the two (2) new poles. Drilling contractor crews will be brought on-site during construction to drill as 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.)	☐	Exploratory digging was previously conducted 6/12/2024. No obstructions found around existing reclosers. There are no existing conduits going to proposed location of the new pole-top reclosers, so spare conduits on-site are not available. New conduits will be used for connecting the controls (located on new junction boxes at the base of the new poles) to the DSCADA cabinet.
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	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	N/A	Recloser nomenclature will remain the same.
10	BPS Separation Requirements - Is this BPS Substation? Y/N (part of PAF) - Changes to pre-existing BPS standards?	N/A	
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?	N/A	
B	**Construction**		
1	**Any safety hazards specific to the facility? i.e., Low Bus, Deterioration, etc.**	☐	Some low bus sections are present. This will not affect construction for the pole-top reclosers.
2	**Prior known Site-Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	N/A	
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? -Required Oversite Needed - Estimated level of CR and LCE support needed	☐	Internal construction (GO) & testing. Field Engineering & Field Ops will oversee recloser & pole installation. Contracted drilling crews will be hired on standby during pole installation in case hard rock is encountered. Substation electricians will oversee and perform work for the disconnect of existing reclosers, removal of above-ground old OFRs, & routing of new conduit.

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info 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?	☐	[redacted] this is not a problem. May want to consider police details for any deliveries during normal working hours to deal with possible traffic on [redacted] Turning radius for delivery vehicles may be an issue. [redacted] No office trailer needed. Shed on site should be sufficient. May need to consider getting a portable restroom for duration of project. If needed, a dumpster could possibly be placed just outside of station on [redacted]
5	Unique Equipment Considerations: Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser	N/A	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	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	☐	Construction work (pole installation, conduit routing) can take place before an outage is taken. Field Ops will handle connection of the pole-top reclosers to the lines. Outage will take one day. Removal of old equipment will take place after new reclosers are installed & is not tied to needing an outage.
7	**Equipment Testing & Acceptance** -Grounding plans / Resources? Will we need grounds hung? -Hi-pot testing and where will the equipment be set up?	N/A	
8	Need for mobile generator and where connected (if needed)	☐	No mobile needed for pole-top recloser solution.
9	Need for mobile battery and where connected (if needed)	☐	No mobile needed for pole-top recloser solution.
10	OT work required or Notable Permit Conditions (special hours)?	N/A	
11	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	N/A	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	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	N/A	
2	**Desktop investigation and EAD Review** -Required Permits -Stormwater Considerations -Dewatering requirements -Wetland and buffer review	N/A	
3	Risk or presence of PCB's/Asbestos/Lead/SF6	N/A	
4	Transformer Spill Containment Recommended?	N/A	
5	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)	N/A	
6	Environmental oversight considerations? (Inspection type/Interval)	N/A	
7	Environmental mitigations - Any matting or seasonal needs? Review D&M Plan with CR.	N/A	
D	**Siting, Project Services, and ROW T&D Rights & Survey**		
1	**Any regulatory concerns or approvals needed?** - Any concerns noted that could be mitigated by scope/design alterations? - Likely to require visual screening? What considerations (feasibility or location)? -Zoning Relief and Permits required?	N/A	
2	Other siting considerations?	N/A	
3	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?	N/A	
4	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	N/A	
5	Installation within Eversource Rights - Is Rights and Restrictions Review required?	N/A	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
6	Expanding Footprint / New Buildings / Fence line or future Expansion Plans?	N/A	
7	Proposed Equipment on same property? - Any Encroachments	N/A	
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	N/A	
2	Space on existing panels for new equipment? (front & rear of panel fronts)	N/A	
3	Panel fronts conform to drawings	N/A	
4	Access to bring new panels into control enclosure	N/A	
5	Nameplate list and location of nameplates	N/A	
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	N/A	
7	Temporary protection, relays, control cable needed? How long will they be required?	N/A	
8	Will relay setting changes be needed? Any additional outage requirements for changes?	☐	Relays will be updated to SEL651-R with Loop Scheme functionality.
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.	X	
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 impact/updates	X	
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination	X	

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Constructability Review Form: **M6-PM-2012 - Eversource**

Substation Constructability Review

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

Photos

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

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