EVERSOURCE

Program Release Form

Approved at May 26, 2021 EPAC

Link to Meeting Minutes

Date Prepared: 05/20/2021	**Project Title: DSCADA LTC Controls Upgrade** [redacted]
Company: Eversource CT	**Facility Name:** [redacted]
Organization: Asset Management	**Project Number: CS00433**
Project Initiator: [redacted]	**Class(es) of Plant: D SS**
Project Manager: [redacted]	**Project Category: Stations - SCADA**
Project Sponsor: [redacted]	**Project Type: Program**
Program Level Title: DSCADA LTC Receivers Program Upgrades	**Capital Investment Part of Original Operating Plan? Yes**
Program Level Project Number: CS00407	**O&M Expenses Part of the Original Operating Plan? N/A**
Total Request: $1,445K	**Estimated in service date(s): 12/30/21**
	Facility Type (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution

Executive Summary

* NOTE: This Program Release is requesting dollar authorization in accordance with the program level criteria specified in Program Level PAF - DSCADA Load Tap Changer (LTC) Receivers Program Upgrades (CS00407) (see Attachment E) and this document for this specific location. The scope for this Program Release is defined in the Program Level PAF and in this document with modifications necessary that address this location. Location/site modification from the Program Level PAF shall be fully described herein for scope and unit cost.

This Program Release is requesting $1,445K to [redacted]

The Program Level PAF had $250K of initial funding approved at the Solution Design Committee (SDC) meeting on 3/17/21. As of 5/17/2021, approximately $40K has been charged to WO CS0009090 under the previously established program CS00090 for engineering and design at [redacted]. These funds will be journaled to a work order under this CS00433 Program Release upon approval.

Project Scope

[redacted]

Scope of Work

[redacted]

Major Material

1. Three (3) LTC DSCADA Cabinets (RTUs)
2. Three (3) LTC tap position monitors.
3. Three (3) 43AMR 3 position switch ("AUTO/MAN/REMOTE")

A constructability review was performed on 8/19/2020 (See attachment D).

Unitized Release Cost

Note: Dollar values are in thousands

Line item Category	Unitized Program Level PAF Cost	Release Cost	Delta
1. ROW / Easements / Land Acquisition	$	$	$
2. Environmental Approvals / Permits	$	$	$
3. Outreach	$7	$1	($6)
4. Siting Approvals / Permits	$	$	$
5. Engineering / Design	$38	$20	($18)
6. Materials (Eversource purchased)	$56	$52	($4)
7. Construction (incl matl's by contractors)	$273	$339	$66
8. Testing / Commissioning	$184	$317	$133
9. Project Mgmt Team	$32	$36	$4
10. Removals	$7	$6	($1)
11. Other	$	$	$
12. Risks	$190	$102	($88)
SUBTOTAL DIRECTS W/ RISKS	**$787**	**$874**	**87**
13. Indirects/Overhead	$402	$466	$64
14. AFUDC	$32	$32	0
PROJECT TOTAL – BASELINE BUDGET	**$1,221**	**$1,377**	**$151**
15. Contingency	$	$72	$72
TOTAL CAPITAL REQUEST	**$1,221**	**$1,445**	**$224**
16. Reimbursables/Customer Contribution	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$1,221**	**$1,445**	**$224**
O&M	$	$	$
Total Request	**$1,221**	**$1,445**	**$224**

*CT program unit cost (Option #2) is $406,300 per transformer (upgrade and conduit, use existing control). Unitized Program Level PAF Cost has been scaled for three (3) transformers.

Justification for Modification

1. **ROW / Easements / Land Acquisition: $0 –** No changes from the Program Level PAF.
2. **Environmental Approvals / Permits: $0 –** No changes from the Program Level PAF.
3. **Outreach: ($6K) –** Savings recognized as all work to be performed in the confines of one (1) station.
4. **Siting Approvals / Permits: $0 –** Connecticut Sitting approval is not required for the DSCADA LTC Control upgrades.
5. **Engineering / Design: ($18K) –** Savings recognized in economies of scale from similar transformer configurations, replicated design work, performed by internal engineering.
6. **Materials (by Eversource): ($4K) –** No major changes from the Program Level PAF.
7. **Construction (including materials supplied by contractors): $66K –** Increased labor for construction support based on vendor quotes.
8. **Testing / Commissioning: $133K –** Increased labor for testing/commissioning support based on vendor quotes.
9. **Project Management Team: $4K –** savings in economies of scale
10. **Removals: ($1K) –** No major changes from the Program Level PAF
11. **Other: $0 –** No changes from Program the Level PAF.
12. **Risk: ($88) –** Savings recognized in economies of scale.
13. **Indirects/Overhead: $64 –** Indirects are proportional to direct costs.
14. **AFUDC: $0 –** No changes from the Program Level PAF.
15. **Contingency: $72 –** Standard contingency included to account for project unknowns.
16. **Reimbursables/Customer Contribution: $0 –** No changes from the Program Level PAF.
17. **O&M: $0 -** No changes from the Program Level PAF.

Project Costs Summary (for 3 transformers)

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	Total
1. ROW / Easements / Land Acquisition				
2. Environmental Approvals / Permits				
3. Outreach			$1	$1
4. Siting Approvals / Permits				
5. Engineering / Design		$13	$7	$20
6. Materials (Eversource purchased)			$52	$52
7. Construction (incl matl's by contractors)			$339	$339
8. Testing / Commissioning			$317	$317
9. Project Mgmt Team			$36	$36
10. Removals			$6	$6
11. Other				
12. Risks			$102	$102
SUBTOTAL DIRECTS W/ RISKS	**$250**	**$13**	**$861**	**$874**
13. Indirects/Overhead		$25	$441	$466
14. AFUDC		$2	$31	$32
PROJECT TOTAL – BASELINE BUDGET	**$250**	**$40**	**$1,333**	**$1,373**
15. Contingency			$72	$72
TOTAL CAPITAL REQUEST	**$250**	**$40**	**$1,405**	**$1,445**
16. Reimbursables/Customer Contribution				
PROJECT TOTAL (LESS REIMBURSABLES)	**$250**	**$40**	**$1,405**	**$1,445**
O&M				
TOTAL REQUEST	**$250**	**$40**	**$1,405**	**$1,445**

Risk of $102K is included for severe weather delays and OT.

Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	Total
ST Labor		$13	$25	$38
OT Labor				
Outside Services Labor			$675	$675
Materials*			$52	$52
Removals			$6	$6
Other			$175	$176
Indirects		$25	$441	$466
AFUDC		$2	$31	$32
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$250**	**$40**	**$1,405**	**$1,445**

Future Financial Impacts:

Provide below the estimated future costs that will result from the project: **N/A**

Note: Dollar values are in thousands:

Future Costs	Year 2021__	Year 20__	Year20__	Year 20__+	Total Future Project Costs
Capital	$ 1,133	$ -	$ -	$ -	$ 1,133
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ 1,133**	**$ -**	**$ -**	**$ -**	**$ 1,133**

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

What functional area(s) will these future costs be funded in? **N/A**

N/A
A representative from the respective functional area is required to be included as a project approver.

If this is other than a Reliability Project, please complete the section below.
This is a reliability project. This section is N/A.
Provide below the estimated financial benefits that will result from the project:
Note: Dollar values are in thousands:

Future Benefits	Year 20__	Year 20__	Year20__	Year 20__+	Total Future Project Benefits
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

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

N/A

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

Asset Retirement Obligation (ARO) and/ or Environmental Cleanup Costs (Environmental Liabilities):
None

Is there an ARO associated with this project?
N/A
Are there other environmental cleanup costs associated with this project?
None known at this time

Alternatives considered with cost Estimates

No changes from the Program Level PAF.

Regulatory Approvals

N/A

Risks and Risk Mitigation Plans

Risk allocation is included to address severe weather delays and overtime.

Contingency

Contingency is included to address potential project unknowns.

Project Schedule

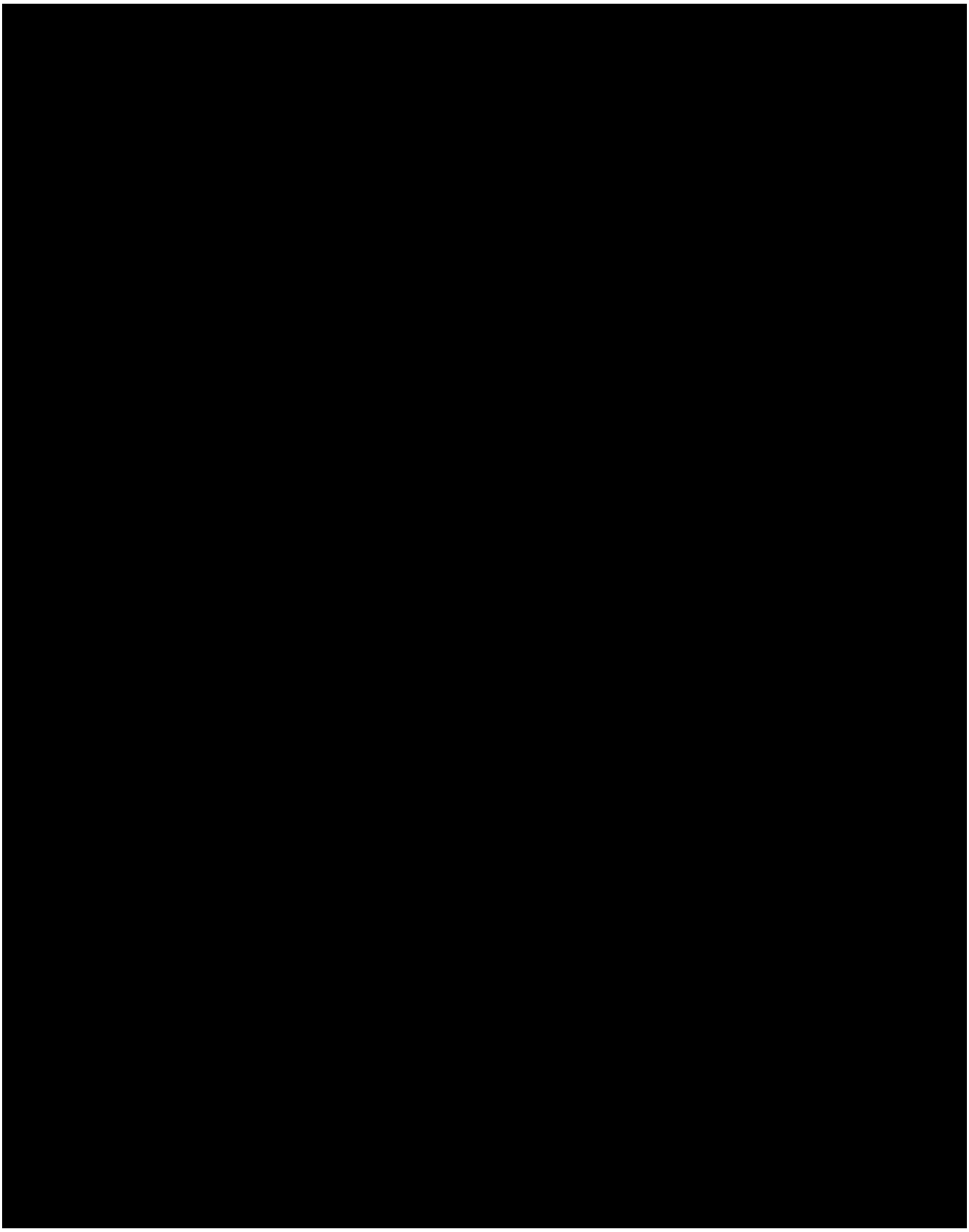
Milestone/Phase Name	Estimated Date
Engineering IFC	3/18/2021
EPAC Meeting – Release Presentation	5/26/2021
EPAC Meeting Program Approval	5/26/2021
Release Construction Start	8/18/2021
Release Construction Completion	12/30/2021

See Attachment C for the Rev2 P6 schedule.

Attachments

- Figure 1 - [redacted] Station One Line
- Attachment A – Engineering Cost Estimate - [redacted] DSCADA LTC Upgrade – CS00433 Rev 1
- Attachment B – CS00433 [redacted] DSCADA Rev2 P6
- Attachment C - Substation Constructability Review Form Lakeview
- Attachment D - CS00407 - DSCADA LTC Receivers Program Upgrades PAF

Figure 1 – [redacted] Station One Line



EVERSOURCE

Project Checklist - Transmission & Substation Capital Project			
Project Name: [redacted] - DSCADA LTC Controls Upgrade		**Project Number: CS00433**	
Facility Type: ☐ BPS ☐ BES ☐ PTF ☐ non-PTF ☐ CIP ☒ Distribution			
PLANNING			
Is a NX-9 required?		No	
Is an ISO-NE PAC presentation required?		No	
ISO-NE Presentation Date (if completed):		Enter Date	
Cost in ISO-NE Presentation ($M) (if completed):		Enter Cost ($M)	
Is a PPA required?		No	
Is a TCA Application Required?		No	
TCA Submittal Date (if submitted):		Enter Date	
Cost in TCA Submittal ($M) (if submitted):		Enter Cost ($M)	
Enter ISO-NE RSP / Asset Condition ID, if assigned:		Enter ISO-NE ID	
PLANNING/PROTECTION & CONTROLS			
Are RAS/SPS/UVLs affected?		No	
OPERATIONS			
Outage Required?	☒ Primary Equipment (Power Transfer)	☐ Secondary Equipment (P&C only)	☐ Outage Not Required
Do SCLL Conditions Exist?		No	
Has an outage schedule been approved?		No	
Are Operations & Maintenance procedures/training required?		No	
STANDARDS			
Does the project include standard equipment and designs?		Yes	
SUBSTATION ENGINEERING			
Does this impact Revenue Metering		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	

EVERSOURCE

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] - DSCADA LTC Controls Upgrade	**Project Number: CS00433**

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

Cost Estimate Backup Details

See Attachment A for the detailed cost backup file.

ESTIMATE SUMARY

Project Title: [redacted] - DSCADA LTC UPGRADE
Project Mgr/Lead: [redacted]
Project Number: CS00433
WO & Task #: TBD
Est. Revision #
Estimate Type - Station work

Estimate By: [redacted]
Date of Estimate: 5/17/2021
ISD:12/31/2021
Estimate #

Template Revision # 01.61

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026
1	ROW / Easements / Land purchases										
2	Environmental Approvals / Permits										
3	Outreach	$1,400	0.2%	0.1%		$1,400					
4	Siting Approvals / Permits										
5	Engineering / Design	$20,200	2.3%	1.4%	$13,100	$7,100					
6	Materials (Eversource purchased)	$52,000	5.9%	3.6%		$52,000					
7	Construction (incl matl's by	$339,300	38.8%	23.5%		$339,300					
8	Testing / Commissioning	$317,400	36.3%	22.0%		$317,400					
9	PMT Project Mgmt Team	$36,000	4.1%	2.5%		$36,000					
10	Removals	$5,800	0.7%	0.4%		$5,800					
11	Other										
12	Risks	$102,000	11.7%	7.1%		$102,000					
	Project Directs Total w/Risks	**$874,100**	100.0%	60.5%	**$13,100**	**$861,000**					
13	Indirects/Overhead	$466,400		32.3%	$25,000	$441,400					
14	AFUDC	$32,500		2.2%	$1,900	$30,600					
	Project Total - Baseline Budget	**$1,373,000**		95.0%	**$40,000**	**$1,333,000**					
15	Contingency	$72,200		5.0%		$72,200					
	Project Total - Funding Approval Level	**$1,445,200**		100.0%	**$40,000**	**$1,405,200**					
16	Reimbursables/Customer Contribution										
	Project Total (less reimbursables)	**$1,445,200**			**$40,000**	**$1,405,200**					
		-									
	Amount of Escalation included above										
6	Total materials - Eversource	$52,000				$52,000					
	Total materials - Contractor										
	Total materials	$52,000				$52,000					
	NOTE: Risk / Contingency is 13.7% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)										

Estimate Range	**-25%**	-	**25%**	
	$1,084,000	-	**$1,807,000**	

COMMENTS:

Project Scope:

[redacted]

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

1. This estimate assumes all construction (electrical, test and civil) will be outsourced.
2. The estimate include manhours for contractor Lead Commission Engineer, contractor construction Representative, Electrical, Test and Civil
3. Estimated risks are assumed to be 7% of the project total cost, 5% contingencies, as per the estimating group recommendations.
4. D-SCADA LTC commissioning and switching will be done in house
5. Each transformer will be taken out of service for few hours to complete testing
6. Estimate assumes existing communication are in good working condition.
7. Drawings have been issued and all material have been ordered
8. The transformer alarms will not be modified and will not be taken back to the SEL-2240 Axion.

RISKS

Potential UG Obstructions	$	-
Severe Weather, Delays, OT	$	102,000
Design development	$	-

Activity ID	Activity Name	Original Duration	Start	Finish	Resources	Predecessors	Successors
[redacted]	DSCADA LTC Controllers (Formerly CS009090)	946	05/17/2018 00 A	03/09/2022 16			
[redacted]	DSCADA LTC Controllers (Formerly CS009090)	0					
	INITIALIZATION AND SCOPE DEVELOPEMENT	854	06/01/2018 08 A	10/25/2021 08			
	INITIALIZATION AND SCOPE DEVELOPEMENT	0	06/01/2018 08 A	06/01/2018 08 A			
START	SCHEDULE START MILESTONE	0	06/01/2018 08 A				PI1200, A1010
	Initial Funding	546	12/01/2020 08 A	12/01/2020 16 A			
PI1200	Project Initiator Develop Intitial Funding Request	10	12/01/2020 08 A	12/01/2020 16 A		START	PI1000
PI1300	Initial Funding Request Approved	10	12/01/2020 08 A	12/01/2020 16 A		PI1000	PI1400
PI1400	Assign Project Manager	10	12/01/2020 08 A	12/01/2020 16 A		PI1300	PI1600, PI1500, CE1600
PI1500	Assign Scheduler	5	12/01/2020 08 A	12/01/2020 16 A		PI1400	CE1600
PI1600	Assign Cost Analyst	5	12/01/2020 08 A	12/01/2020 16 A		PI1400	CE1600
PI1000	Submit Initial Funding Request	0		12/01/2020 16 A		PI1200	PI1300
	SDC Approval	57	06/15/2018 08 A	06/29/2018 08 A			
CE1400	N/R - ES Engineering Develop P&C Conceptual Engineering Design in Accordance wit	15	06/15/2018 08 A	06/29/2018 08 A		CE1600	CGE1000, CE1710
CE1500	N/R - ES Engineering Develop Communications Conceptual Engineering Design in Acc	15	06/15/2018 08 A	06/29/2018 08 A		CE1600	CE1710
SDC1000	N/R - Solution Design Committee(SDC) Approval (If needed)	10	06/15/2018 08 A	06/29/2018 08 A		SSF1000	PE1700
CE1710	N/R - Conduct Conceptual Constructability Walk Down	1	06/15/2018 08 A	06/29/2018 08 A		CE1400, CE1000, CE1500, CE1100	CGE1000
CE1600	N/R - Conduct Project Team Kick off Meeting	1	06/15/2018 08 A	06/29/2018 08 A		PI1600, PI1400, PI1500	CE1100, CE1000, CE1500, CE1400
CE1100	N/R - Develop Electrical Substation Conceptual Engineering Design in Accordance with	15	06/15/2018 08 A	06/29/2018 08 A		CE1600	CGE1000, CE1710
SSF1000	N/R - Develop Soultions Selection Form (SSF)	20	06/15/2018 08 A	06/29/2018 08 A		CGE1000	SDC1000
CGE1000	N/R - Develop Conceptual Grade Estimate (-25%+50%)	10	06/15/2018 08 A	06/29/2018 08 A		CE1400, CE1100, CE1710, CE1000	SSF1000
CE1000	N/R - ES Engineering Develop Civil Substation Conceptual Engineering Design in Accor	15	06/15/2018 08 A	06/29/2018 08 A		CE1600	CE1710, CGE1000
	EPAC Partial Funding	525	12/14/2018 08 A	12/14/2018 16 A			
PF1000	N/R - EPAC Partial Funding Approval	1	12/14/2018 08 A	12/14/2018 16 A		PAFP1200, ATCGE1010	DSSE-200, DSSE-100, DSSE-205, DSSE-400
ATCGE1010	N/R - Develop At Least Conceptual Grade Estimate (-25%+50%)	10	12/14/2018 08 A	12/14/2018 16 A		PE1720	PAFP1000, PF1000
PE1700	N/R - Conduct Preliminary Constructability Walk Down	1	12/14/2018 08 A	12/14/2018 16 A		SDC1000	PE1710
PAFP1000	N/R - Submit Partial Funding PAF for Internal Review	10	12/14/2018 08 A	12/14/2018 16 A		ATCGE1010	PAFP1100
PAFP1200	N/R - Incorporate EPAC Partial Funding PAF Review Comments	5	12/14/2018 08 A	12/14/2018 16 A		PAFP1100	PF1000
PAFP1100	N/R - Incorporate Internal Review Comments & Submit Partial Funding PAF to EPAC f	5	12/14/2018 08 A	12/14/2018 16 A		PAFP1000	PAFP1200
PE1710	N/R - Create Engineering Scope Document	5	12/14/2018 08 A	12/14/2018 16 A		PE1700	PE1720
PE1720	N/R - Engineering Scope Document Complete	0		12/14/2018 16 A		PE1710	ATCGE1010, AT3001
	EPAC Full Funding	15	07/15/2019 00 A	06/01/2021 16			
DE1600	Create Planning Grade Estimate (+/-25% Full Funding)	10	07/15/2019 00 A	07/20/2019 16 A		DE2000	FF1000, PAFF2000
DE1700	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM)	4	07/15/2019 00 A	07/20/2019 16 A		DSSE-200, DE1900	DE2000
PAFF2000	Submit Full Funding PAF for Internal Review	3	04/20/2021 00 A	04/30/2021 00 A		DE1600	PAFF2100
DE1900	Conduct Detail Constructability Walk Down	1	04/26/2021 00 A	04/26/2021 16 A		DSSE-200, DSSE-100, DSSE-400	DE1700
DE2000	Project Constructability Review Complete	4	04/26/2021 00 A	04/26/2021 16 A		DE1700	DE1600
PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Revie	4	05/17/2021 08	05/20/2021 16		PAFF2000	PAFF2200
PAFF2200	Present Full Funding PAF at EPAC Meeting	0		05/26/2021 16*		PAFF2100	PAFF2300
PAFF2300	Incorporate EPAC Full Funding PAF Review Comments	3	05/27/2021 08	06/01/2021 16		PAFF2200	FF1000
FF1000	EPAC Full Funding Approval	0		06/01/2021 16		DE1600, PAFF2300	DSSE-520, DSSE-440, DSSE-510, DSSE-240, DSS
	T-Minus Milestones "A" Group	111	07/19/2019 00 A	08/18/2021 08			
AT2605	T-26.05 - 30% Design / Engineering Completed	0		07/19/2019 00 A		A3380	
AT1811	T-18.11 - 70% Design/Engineering Completed	0		08/30/2019 00 A		DSSE-205	
AT0404	A-T-04.04 ALL FINAL RELAY PROTECTIVE SETTING ISSUED	0		07/20/2020 16 A		DSSE-440	AT00
AT0805	T-08.05 - Final Engineering Issued for Construction W/BOM	0		03/22/2021 08 A		DSSE-120, DSSE-240, DSSE-220, DSSE-	AT00

TASK filter: All Activities

© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish	Resources	Predecessors	Successors
AT3001	T-30.01 - Eng. Project Scoping Document Issued (Scope Lockdown)	0		03/22/2021 08 A		PE1720	
AT1201	A-T-12.01 SCADA Date (Tab) Sheets/Signal List Sent to LCC	0		03/22/2021 16 A		DSSE-990, DSSE-220	AT00
AT0805E	A-T-08.05.Elect IFC - Electrical (AG) w/Final BOM	0		03/22/2021 16 A		DSSE-240, DSSE-1180	AT00
AT0805C	A-T-08.05.Civil IFC - Civil (BG) w/BOM	0		03/22/2021 16 A		DSSE-120	AT00
AT0805P	A-T-08.05.P&C IFC - P&C w/BOM	0		03/22/2021 16 A		DSSE-220	AT00
AT2404	A-T-24.04 DETERMINE / ASSIGN LCE (LEAD COMMISSIONING ENGINEER)	0		04/16/2021 16 A		LCE200	AT00
AT0203	N/R - A-T-02.03 CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0		04/28/2021 16 A		A1010, A1170	AT00
AT0409	N/R - A-T-04.09 ALL FIRM TOA APPLICATIONS DUE TO LCC (for DISTRIBUTION	0		04/28/2021 16 A		A1250	AT00
AT1202	A-T-12.02 P/C DESCRIPTION / DRAFT OPERATING INSTRUCTIONS ISSUED	0		05/25/2021 16		DSSE-920, DSSE-470, DSSE-930, DSSE-	AT00
AT1301	A-T-13.01 COMMISSIONING PLAN COMPLETE	0		07/06/2021 16		LCE400	AT00
AT0401	A-T-04.01 ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0		07/20/2021 16		DSSE-1130, DSSE-1010, DSSE-550, DSS	AT00
AT00	A-T-00 - START OF CONSTRUCTION - WO#	0	08/18/2021 08*			AT2404, AT1301, AT0805E, AT0409, AT040	A1150, A1140, A1130, CSM, A1120
T-Minus Milestones "B" Group for Transformer Test		175	04/28/2021 08 A	10/25/2021 08			
AT1801	N/R - A-T-18.01 ALL FIRM TOA APPLICATIONS DUE TO LCC	0		04/28/2021 08 A		A1250	BT00
BT00	B-T-00 - START OF CONSTRUCTION - WO#	0	10/25/2021 08*			DSSE-240, DSSE-120, DSSE-1180, AT18(	CSM
ROW AND EASEMENTS		0					
ENVIRONMENTAL APPROVALS AND PERMITS		0					
SITING APPROVALS AND PERMITS		0					
ENGINEERING & DESIGN		675	05/17/2018 00 A	03/18/2021 16 A			
Engineering Services Staffing		5	07/20/2020 08 A	07/24/2020 16 A			
A3370	Decision Required Regarding Engineering Staffing (ES, COC, BID)	5	07/20/2020 08 A	07/24/2020 16 A			TMP1140
EOC - Engineer of Choice Process		1	12/20/2019 08 A	12/20/2019 16 A			
TMP1180	N/R Engineering of Choice (EOC) - EOC Committee Reviews at Monthly Meeting & Ap	1	12/20/2019 08 A	12/20/2019 16 A		TMP1200	TMP1220
TMP1140	N/R Engineering of Choice (EOC) - Provide RFP to Single Vendor	1	12/20/2019 08 A	12/20/2019 16 A		A3370	TMP1150
TMP1200	N/R Engineering of Choice (EOC) - DR Prepared by Project Engineer & Project Contrc	1	12/20/2019 08 A	12/20/2019 16 A		TMP1150	TMP1180
TMP1220	N/R Engineering of Choice (EOC) - PO Issued for Vendor -30% Design Effort (add Ver	1	12/20/2019 08 A	12/20/2019 16 A		TMP1180	
TMP1150	N/R Engineering of Choice (EOC) - Vendor Responds with Proposal	1	12/20/2019 08 A	12/20/2019 16 A		TMP1140	TMP1200
Civil Engineering		631	01/02/2019 00 A	03/03/2021 16 A			
DSSE-100	Design Package to Civil (Physical Mark-ups)	8	01/02/2019 00 A	01/07/2019 00 A		PF1000	DE1900, DSSE-110
DSSE-110	Civil Package to Design	5	01/08/2019 08 A	01/14/2019 16 A		DSSE-100	DSSE-500, DSSE-120, DSSE-1140
DSSE-120	Civil Package IFC (Rework)	5	01/15/2021 08 A	03/03/2021 16 A		DSSE-110, FF1000	A1170, AT0805, A1250, AT0805C, BT00
Electrical Engineering		127	07/24/2019 08 A	03/18/2021 16 A			
DSSE-200	70% Electrical Design Package Design	40	07/24/2019 08 A	07/31/2019 16 A		PF1000, A3380	DE1900, DE1700, DSSE-205
DSSE-205	70% Electrical Design Package Drafting	20	08/06/2019 08 A	08/30/2019 16 A		PF1000, DSSE-200	DSSE-210, LCE100, AT1811
DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	5	09/06/2019 08 A	09/13/2019 16 A		FF1000, DSSE-210, DSSE-230	DSSE-480, A1170, AT0805E, BT00, A1250, DSSE-9
DSSE-460	Operating Instructions - SSED Review Draft Distribution OI	5	09/06/2019 08 A	09/13/2019 16 A		DSSE-450, DSSE-440	AT1202
DSSE-920	Operating Instructions - SSED Review Draft Convex OI	5	09/06/2019 08 A	09/13/2019 16 A		DSSE-440, DSSE-450	AT1202
DSSE-210	100% Electrical Design Package IFR	20	09/06/2019 08 A	09/13/2019 16 A		DSSE-205	DSSE-230, DSSE-240
DSSE-230	Electrical Engineering - BOM Complete	2	09/06/2019 08 A	09/13/2019 16 A		DSSE-210	DSSE-240
DSSE-1180	Revised Electrical Engineering - Electrical Package IFC (Physical & Electrical)	20	03/15/2021 08 A	03/18/2021 16 A		DSSE-240	DSSE-480, A1170, AT0805E, BT00, A1250, DSSE-9
Non NX-9 Thermal Ratings		440	09/06/2019 08 A	06/01/2020 16 A			
NX9A-EM44	P&C Develops and Provides LTRC with P&C Checklist & Thermal Ratings Data	5	09/06/2019 08 A	09/06/2019 16 A		A3380	NX9A-EM54
NX9A-EM54	LTRC Prepares and Sends Thermal Rating Data for TRC Review	5	05/24/2020 08 A	05/28/2020 16 A		NX9A-EM44	NX9A-EM64
NX9A-EM64	TRC Reviews and Approves Thermal Rating Data	5	05/24/2020 08 A	05/28/2020 16 A		NX9A-EM54	NX9A-EM74
NX9A-EM74	LTRC Files Capability Sheets	5	06/01/2020 08 A	06/01/2020 16 A		NX9A-EM64	CFM
P&C Engineering		85	05/17/2018 00 A	07/19/2019 16 A			

TASK filter: All Activities

© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish	Resources	Predecessors	Successors
DSSE-410	Drafting Prepare & Issue Back to P&C	10	05/17/2018 00 A	06/22/2018 16 A		DSSE-400	A3380
DSSE-400	Prepare & Issue P&C Design Package to Drafting	20	05/17/2018 00 A	06/22/2018 16 A		PF1000	DSSE-410, DE1900
DSSE-480	N/R P&C INITIATE CASCADE FORMS (Apenndix A) for Construction	20	07/10/2019 08 A	07/19/2019 16 A		DSSE-240, DSSE-1180	CFM
DSSE-990	N/R P&C INITIATE SCADA Data Sheets	20	07/10/2019 08 A	07/19/2019 16 A		DSSE-240, DSSE-1180	AT1201, DSSE-220
A3380	Issue P&C Package Design	10	07/10/2019 08 A	07/19/2019 16 A		DSSE-410	DSSE-200, DSSE-510, NX9A-EM44, DSSE-440, AT
DSSE-220	N/R SDS Complete	2	07/10/2019 08 A	07/19/2019 16 A		DSSE-990	AT1201, AT0805P, AT0805
DSSE-470	N/R Operating Instructions - P&C Review Draft Distribution OI	5	07/10/2019 08 A	07/19/2019 16 A		DSSE-450, DSSE-440	AT1202
DSSE-930	N/R Operating Instructions - P&C Review Draft Convex OI	5	07/10/2019 08 A	07/19/2019 16 A		DSSE-440, DSSE-450	AT1202
DSSE-450	N/R Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	20	07/10/2019 08 A	07/19/2019 16 A		DSSE-440	DSSE-460, DSSE-930, DSSE-920, DSSE-470
Relay Settings		20	07/10/2019 08 A	07/19/2019 16 A			
DSSE-440	N/R Relay Settings - Prepare and Issue Relay Settings IFC	20	07/10/2019 08 A	07/19/2019 16 A		FF1000, A3380	DSSE-450, AT0404, DSSE-930, DSSE-920, DSSE-
MATERIAL PROCUREMENT		556	08/20/2018 00 A	07/20/2021 16			
MATERIAL FOR P&C		88	03/15/2021 08 A	07/16/2021 16			
DSSE-510	MATERIAL - P&C - Prepare & Issue DR	5	03/15/2021 08 A	03/19/2021 16 A		A3380, FF1000	DSSE-980
DSSE-980	MATERIAL - P&C - Procurement Issue PO	10	04/19/2021 08 A	05/14/2021 16 A		DSSE-510	DSSE-1000
DSSE-1000	MATERIAL - P&C - Material Vendor Delivery Leadtime	60	05/17/2021 08 A	07/15/2021 16		DSSE-980	DSSE-1010
DSSE-1010	MATERIAL - P&C - Engineering Confirm Material Delivery to Site	1	07/16/2021 08	07/16/2021 16		DSSE-1000	AT0401
MATERIAL FOR ELECTRICAL		65	08/20/2018 00 A	06/21/2021 16			
DSSE-520	MATERIAL - Electrical - Prepare & Issue DR	5	08/20/2018 00 A	08/20/2018 00 A		FF1000, DSSE-1180	DSSE-1020, DSSE-530
DSSE-530	Electrical (AG) Material Ordered	0		08/20/2018 00 A		DSSE-520	
DSSE-1020	MATERIAL - ELectrical - Procurement Issue PO	10	04/19/2021 08 A	05/21/2021 16		DSSE-520	DSSE-1030
DSSE-1030	MATERIAL - ELectrical - Material Vendor Delivery Leadtime	30	05/22/2021 08	06/20/2021 16		DSSE-1020	DSSE-550
DSSE-550	MATERIAL - Electrical - Material Handler Confirms Material Delivery to Site	1	06/21/2021 08	06/21/2021 16		DSSE-1030	AT0401
MATERIAL FOR CIVIL - STEEL		65	05/06/2019 08 A	07/20/2021 16			
DSSE-500	MATERIAL - CIVIL - STEEL - Prepare & Issue DR	5	05/06/2019 08 A	05/13/2019 16 A		DSSE-110, FF1000	DSSE-1040, DSSE-540
DSSE-540	N/R ? Civil (BG) Material Ordered	0		05/13/2019 16 A		DSSE-500	
DSSE-1040	MATERIAL - CIVIL - STEEL - Procurement Issue PO	10	04/19/2021 08 A	05/10/2021 08 A		DSSE-500	DSSE-1050
DSSE-1050	MATERIAL - CIVIL - STEEL - Material Vendor Delivery Leadtime	70	05/10/2021 08 A	07/19/2021 16		DSSE-1040	DSSE-560
DSSE-560	MATERIAL - CIVIL - STEEL - Material Handler Confirms Material Delivery to Site	1	07/20/2021 08	07/20/2021 16		DSSE-1050	AT0401
MATERIAL FOR CIVIL - CONDUIT		521	05/06/2019 08 A	05/31/2021 16			
DSSE-1140	MATERIAL - CIVIL - CONDUIT - Prepare & Issue DR	6	05/06/2019 08 A	05/13/2019 16 A		FF1000, DSSE-110	DSSE-1150, DSSE-1170
DSSE-1170	N/R ? Civil (BG) Material Ordered	0		05/13/2019 16 A		DSSE-1140	
DSSE-1150	MATERIAL - CIVIL - CONDUIT - Procurement Issue PO	10	04/19/2021 08 A	05/14/2021 16 A		DSSE-1140	DSSE-1160
DSSE-1160	MATERIAL - CIVIL - CONDUIT - Material Vendor Delivery Leadtime	14	05/17/2021 08 A	05/30/2021 16		DSSE-1150	DSSE-1130
DSSE-1130	MATERIAL - CIVIL - CONDUIT - Material Handler Confirms Material Delivery to Site	1	05/31/2021 08	05/31/2021 16		DSSE-1160	AT0401
CONSTRUCTION		187	04/19/2021 08 A	01/14/2022 16			
CONSTRUCTION - CIVIL		5	08/18/2021 08	08/24/2021 16			
A1120	Construction - Civil	5	08/18/2021 08	08/24/2021 16		AT00	DSSE-900, CFM
CONSTRUCTION - ELECTRICAL		92	08/18/2021 08	12/30/2021 16			
A1130	Construction - Electrical	92	08/18/2021 08	12/30/2021 16		AT00	CFM
CONSTRUCTION - P&C		5	08/18/2021 08	08/24/2021 16			
A1140	Construction - P&C Implement Relay Settings	5	08/18/2021 08	08/24/2021 16		AT00	CFM
CONSTRUCTION - COMMUNICATIONS		5	08/18/2021 08	08/24/2021 16			
A1150	Construction - Communications	5	08/18/2021 08	08/24/2021 16		AT00	CFM
CONSTRUCTION - CONST.REP TASKS		187	04/19/2021 08 A	01/14/2022 16			
A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4	5	04/19/2021 08 A	04/28/2021 16 A		DSSE-120, DSSE-240, DSSE-1180	AT0409, AT1801

TASK filter: All Activities

© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish	Resources	Predecessors	Successors
A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10	01/03/2022 08	01/14/2022 16	[redacted]	CFM	A1030
CONSTRUCTION RESOURCE TRACKING		46	10/25/2021 08	12/30/2021 16			
ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	46	10/25/2021 08	12/30/2021 16		CSM	CFM
CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	46	10/25/2021 08	12/30/2021 16		CSM	CFM
A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT	1	11/29/2021 08	11/29/2021 16		TOA-Const1, TOA-Const2, TOA-Const3	CFM
A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN	1	12/10/2021 08	12/10/2021 16		TOA-Const1, TOA-Const2, TOA-Const3	CFM
CONSTRUCTION OUTAGES		58	10/25/2021 08	12/30/2021 16			
TOA-Const1	OUTAGE / General Construction Work	14	10/25/2021 08	11/09/2021 16		CSM	A1080, CFM, A1070, TOA-Const2
CSM	Construction Start Milestone	0	10/25/2021 08			AT00, BT00	ConRep-S, TOA-Const1, CONSTelec, TOA-Const2,
TOA-Const2	OUTAGE / General Construction Work	10	11/09/2021 08	11/19/2021 16		CSM, TOA-Const1	A1080, CFM, A1070, TOA-Const3
TOA-Const3	OUTAGE / General Construction Work	11	11/29/2021 08	12/10/2021 16		CSM, TOA-Const2	A1080, CFM, A1070
CFM	Construction Finish Milestone	0		12/30/2021 16		A1080, A1070, DSSE-480, NX9A-EM74, A	A1260, A1040, FINISH, DSSE-1100, A1030, DSSE-9
ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0		12/30/2021 16*		CFM	LCE800
CONSTRUCTION CLOSEOUT		2	01/03/2022 08	01/04/2022 16			
DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	2	01/03/2022 08	01/04/2022 16		A1120, CFM	DSSE-860
TEST AND COMMISSION		112	04/12/2021 08 A	09/17/2021 16			
TEST - SERVICES STAFFING DECISION		11	04/12/2021 08 A	04/14/2021 16 A			
A1010	STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/COC	1	04/12/2021 08 A	04/12/2021 16 A		START	AT0203, A3250
A3250	N/R - Procure Testing Vendor {predecessor to test planning}	10	04/14/2021 08 A	04/14/2021 16 A		A1010	LCE400, LCE310, LCE320
LCE PLANNING		81	04/12/2021 08 A	08/04/2021 16			
LCE100	PM to Request Lead Commissioning Engineer GO/NO-GO {30% or 70% design is ofte	2	04/12/2021 08 A	05/03/2021 16 A		DSSE-205	LCE200
LCE200	Assign Lead Commissioning Engineer	2	06/01/2021 08*	06/02/2021 16		LCE100	LCE310, AT2404
LCE400	Develop Test and Commissioning Plan	21	06/07/2021 08	07/06/2021 16		A3250, LCE310, LCE320	LCE500, AT1301
LCE500	LCE Review and Approve Vendor's Test and Commissioning Plan	21	07/07/2021 08	08/04/2021 16		LCE400	LCE610, LCE620
TEST ACTIVITIES		73	06/05/2021 08	09/17/2021 16			
LCE310	Mobilize LCE Prior to Construction	2	06/05/2021 08	06/06/2021 16		LCE200, A3250	LCE400
LCE320	Mobilize Testing Vendor Prior to Construction	2	06/05/2021 08	06/06/2021 16		A3250	LCE400
LCE610	LCE Oversee Execution of Test and Commissioning Plan	30	08/05/2021 08	09/16/2021 16		LCE500	CFM
LCE620	Execute Test and Commissioning Plan	30	08/05/2021 08	09/16/2021 16		LCE500	LCE700
LCE700	LCE Ensure Test Group Prepare Electrical Field Mark Ups	1	09/17/2021 08	09/17/2021 16		LCE620	CFM
Project Close-Out		46	01/03/2022 08	03/09/2022 16			
Project Close-Out		5	01/03/2022 08	01/07/2022 16			
DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5	01/03/2022 08	01/07/2022 16		CFM	DSSE-820, DSSE-950, DSSE-860
Civil As-Builts		41	01/10/2022 08	03/09/2022 16			
DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	10	01/10/2022 08	01/24/2022 16		DSSE-900, DSSE-1100	DSSE-970
DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	3	01/25/2022 08	01/27/2022 16		DSSE-860	DSSE-870
DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drav	8	01/28/2022 08	02/08/2022 16		DSSE-970	DSSE-1120, DSSE-880
DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	20	02/09/2022 08	03/09/2022 16		DSSE-870	FINISH
DSSE-880	PM to Document Civil As-Built Drawings Complete	1	02/09/2022 08	02/09/2022 16		DSSE-870	FINISH
Electrical As-Builts		41	01/10/2022 08	03/09/2022 16			
DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	10	01/10/2022 08	01/24/2022 16		DSSE-1100	DSSE-940
DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	3	01/25/2022 08	01/27/2022 16		DSSE-820	DSSE-830
DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drav	8	01/28/2022 08	02/08/2022 16		DSSE-950, DSSE-960, DSSE-940	DSSE-840, DSSE-1110
DSSE-840	PM to Document Electrical As-Built Drawings Complete	1	02/09/2022 08	02/09/2022 16		DSSE-830, LCE900	FINISH
DSSE-1110	Complete TD-176 ELECTRICAL Design Prep & Issue As-Built Dwgs	20	02/09/2022 08	03/09/2022 16		DSSE-830	FINISH
P&C As-Builts		10	01/03/2022 08	01/14/2022 16			

TASK filter: All Activities

© Oracle Corporation

Activity ID	Activity Name	Original Duration	Start	Finish	Resources	Predecessors	Successors
DSSE-960	P&C Submits Relay Setting As-Builts	5	01/03/2022 08	01/07/2022 16	[redacted]	CFM	DSSE-830
DSSE-950	P&C Submits SDS As-Builts	5	01/10/2022 08	01/14/2022 16		DSSE-1100	DSSE-830
Test Close-Out		11	01/03/2022 08	01/18/2022 16			
LCE800	LCE Ensures Marked up Prints Ready for Pick-up	1	01/03/2022 08	01/03/2022 16		ISD	LCE900
LCE900	LCE Review Test Data and Issue Commissioning Report	10	01/04/2022 08	01/18/2022 16		LCE800	DSSE-840
SITE RESTORATION CLOSEOUT		10	01/03/2022 08	01/14/2022 16			
A1110	Restore / Remediate Site	10	01/03/2022 08	01/14/2022 16		CFM	FINISH
MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT		40	01/03/2022 08	03/01/2022 16			
A1020	Cost Analyst Prepares FINAL Units of Property	30	01/03/2022 08	02/14/2022 16		CFM	FINISH
A1030	Asset Management Complete Asset Update(s) in CASCADE	30	01/18/2022 08	03/01/2022 16		CFM, A1260	FINISH
PROJECT MANAGEMENT CLOSEOUT		46	01/03/2022 08	03/09/2022 16			
A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30	01/03/2022 08	02/14/2022 16		CFM	FINISH
FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0		03/09/2022 16		DSSE-1120, A1040, CFM, DSSE-880, DSS	
OVERHEAD / INDIRECTS		10	04/26/2021 08 A	04/26/2021 16 A			
PROJECT MANAGEMENT		10	04/26/2021 08 A	04/26/2021 16 A			
A1170	N/R - Prepare CAN (Construction Authorization Notice)	10	04/26/2021 08 A	04/26/2021 16 A		DSSE-120, DSSE-240, DSSE-1180	AT0203

TASK filter: All Activities

© Oracle Corporation

EVERSOURCE

Constructability Review Form: **Substation**

Project Title: [redacted] Dscada LTC Upgrade	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS009090/CS00433	**Project Constructability Phase:**	
Date(s) of Constructability Review: **08/19/2020**	☐ Conceptual Engineering Design	
Click to enter a date	☐ Preliminary Engineering Design	
	☒ Detailed Engineering Design	
Project Scope Statement: Install DSCADA equipment for the 31A-1X, 31A-2X and 31A-3X		

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

[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:

EVERSOURCE

Constructability Review Form: **Substation**

[redacted] _____ *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	Determine cable route from transformers to control house. Determine if existing conduits can be used to install crush proof fiber.	New were engineered with IFC.
2	Determine if existing communication equipment are accommodate new installation	Existing communication equipment are adequate
3	DSCADA LTC RTU box location	DSCADA LTC RTU box for the 31A-1X, 31A-2X and 31A-3X were relocated from steel structures in the yard to transformers' LTC cabinets side
4		
5		

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
A	**Engineering & Asset Management**		

EVERSOURCE

Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
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	☐	Scope adequate
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?		Materials 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..		Adequate space for Dscada addition
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	

EVERSOURCE

Constructability Review Form: **Substation**

	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?	N/A	
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

EVERSOURCE

Constructability Review Form: **Substation**

	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
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.**	☐	N/A
2	**Prior known Site Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	☐	
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	☐	N/A

EVERSOURCE

Constructability Review Form: **Substation**

	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?	☐	No issues
5	Unique Equipment Considerations: Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser		N/A

EVERSOURCE

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	☐	Outages determined by construction
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)	☐	N/A
9	Need for mobile battery and where connected (if needed)	☐	N/A
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

EVERSOURCE

Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
C	**Environmental**		
1	Soil Pre-Characterization or Grab Sampling Completed/Planned	☐	N/R
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, 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	☐	N/A
2	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?	☐	N/A
3	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	☐	N/A
4	Installation within Eversource Rights - Is Rights and Restrictions Review required?	☐	N/A
5	Expanding Footprint / New Buildings or future Expansion Plans?	☐	N/A
6	Proposed Equipment on same property? - Any Encroachments	☐	N/A

EVERSOURCE

Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	☐	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?		N/A
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	☐	N/A
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.	☐	N/A
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.	☐	N/A
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.	☐	N/A
5	Review and list any remote station impacts/updates	☐	N/A
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination	☐	N/A
7	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed	☐	N/A

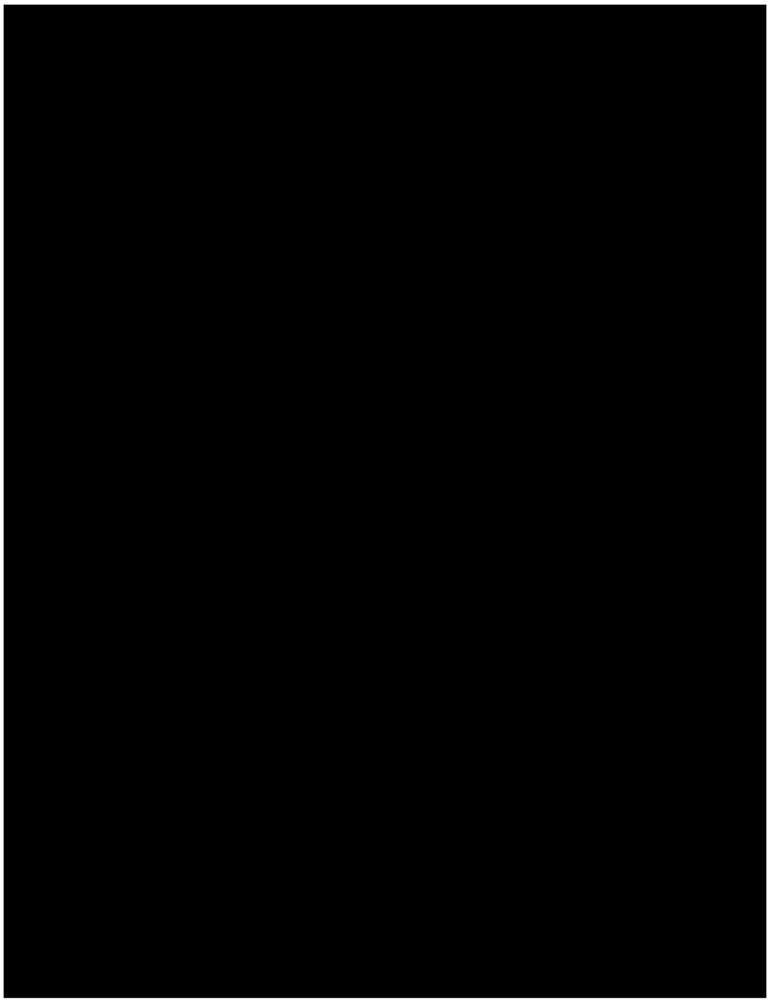
EVERSOURCE

Constructability Review Form: **Substation**

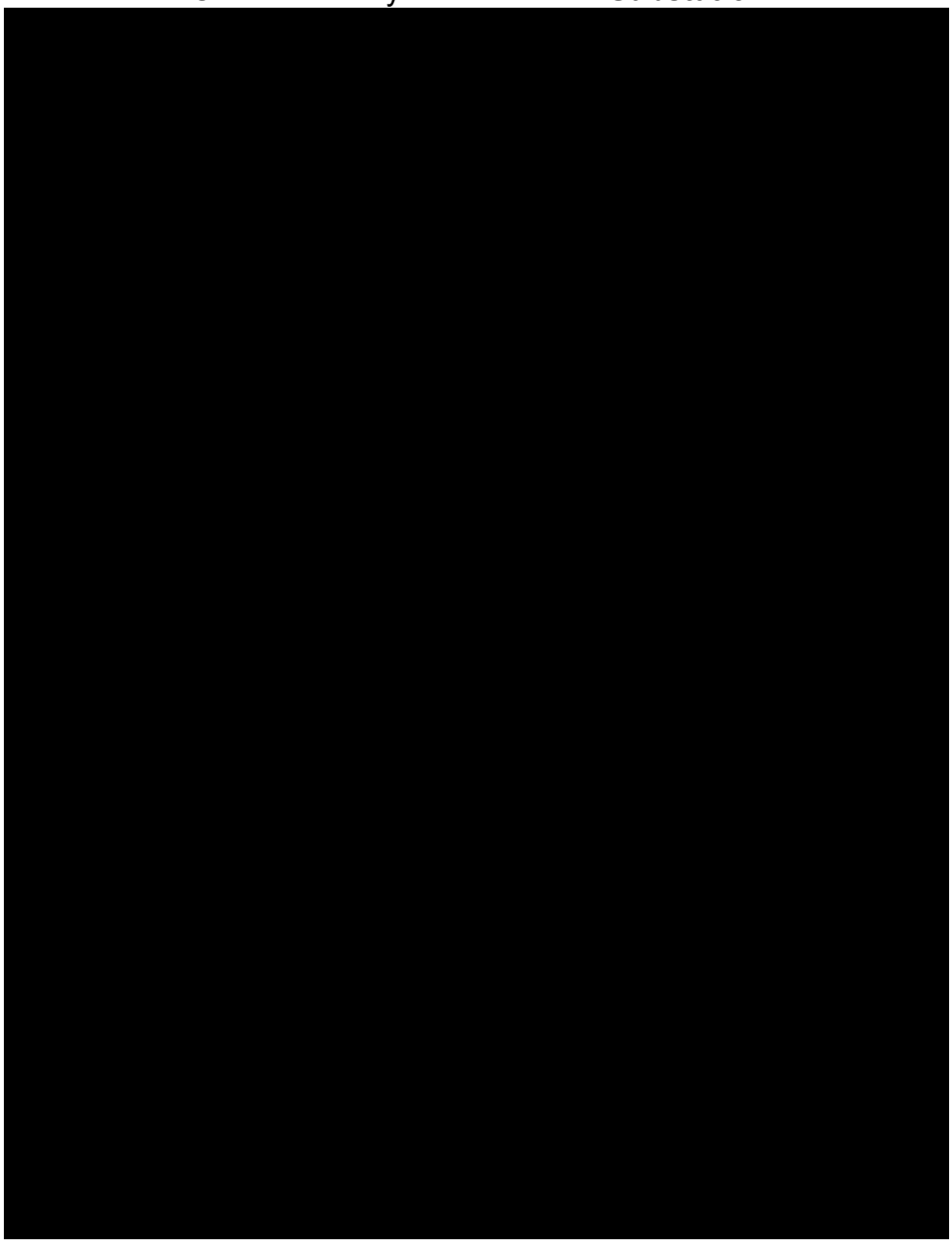
	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
8	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	☐	Space for additional cabinet
9	Review third party Telecommunications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

Photos

DSCADA Cabinet Installed inside the switchgear



31A-1X Transformer LTC cabinet with Beckwith M-200B control



Mounting location of new DSCADA LTC cabinet

Note that 31A-1X, 31A-2X and 31A-3X are sister transformers, so photos are representative of the three

EVERSOURCE

Constructability Review Form: **Substation**



EVERSOURCE

Operations Program Level Project Authorization Form

Approved at March 17, 2021 SDC

Link to Meeting Minutes

Date Prepared: 05/11/2021	**Program Title**: DSCADA LTC Receivers Program Upgrades
Company: Eversource CT	**Program Number:** CS00407
Organization: Asset Management	**Class(es) of Plant:** D SS
Project Initiator: [redacted]	**Project Category:** Stations - SCADA
Project Manager: [redacted]	**Project Type:** Program
Project Sponsor: [redacted]	**Project Purpose:** Replace Obsolete Radio System
Estimated in service date: Q4 2030	**If Transmission Project: PTF/Non-PTF? N/A**
Eng. / Constr. Resources Budgeted? Yes	**Capital Investment Part of Original Operating Plan?** Yes
Authorization Type: Program Approval with Initial Funding	**O&M Expenses Part of the Original Operating Plan?** N/A
Initial Funding Request: $250K	**Estimated Program value (CT):** $45M

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This Initial Funding Request of $250K is to establish a program to install [redacted] Note that the $250K initial funding will cover through preliminary design, constructability review, full detailed schedules, estimate development and program release development/approval.

[redacted]

[redacted] under the original CS00090 Program. [redacted] under the new CS00407 Program. The list of substations and associated LTC transformers is provided in Attachment 1. The new program transitions 46 stations to a program of individual project releases scoped, engineered, and funded specifically for each individual station. Accordingly, the "old" CS00090 will coordinate with the new CS00407 program going forward.

Background details:

$8.5M in total prior costs were charged under the original 2015 CS00090 general one-time approval program through 2020. Sixty-six (66) workorders remain open or in service in Power Plan™. Eighteen (18) of the original work orders were completed for a total direct cost of $4.5M. The total direct cost budget approved for CS00090 was $5.808M, so total direct costs had not exceeded the +/- 10% limit of the APS-1 procedure. As construction, system operations control, and regulatory scope requirements grew, costs per unit increased substantially. Therefore, it was determined that the remainder of the work would be completed as a new program with release documentation to better provide comparable data for each remaining station's scope for improved control and tracking. Accordingly, units / stations with completed construction on the previous CS00090 will remain on that project.

The original program's scope creep was primarily the result of SOC requirements and expectations for voltage tap changer control and position indication. As originally proposed, the scope for the program was primarily for relay and DSCADA connectivity to abandon the obsolete and failing radio control system. The estimate did not account for these additional SOC requirements. CS00090 program documentation is attached for reference.

Transitioning to a DSCADA LTC Automation program with subsequently funded project releases mitigates the need for a high dollar supplemental request to the original CS00090 program. The transitioning moved remaining work to new Program CS00407 for the primary purpose of tracking specific station costs of a release based on redefined detailed scope from an Engineering Checklist. The checklist that follows in the "Project Scope" section defines all possible scope (worst case) that could be required for a station LTC transformer. Release estimates going forward will be established against what most remaining transformers will require based on a revised/updated unitized cost. Extra scope (e.g. conduit, and/or controllers) will follow a pre-established tiered cost range/benchmark developed from current CS00407 Program Substation Engineering and Design's Decision-Making Estimates that follow.

Planned Releases

Upon approval of this Initial Funding, three releases are planned for three substations with a total of [redacted] dditionally, all planned releases will be coordinated with other programs and work conflicts (where possible) that might arise in the selected substations. Coordination with other station activities not currently identified entailing switching, repairs etc. will be considered when identifying and planning subsequent releases.

Project Costs Summary

Estimates include man-days for outsourced Lead Commissioning Engineer (LCE), and Construction Representative. Material estimates, labor estimates, and vendor quotes are based on recently completed work in 2020. All new equipment shall be installed within the confines of the existing fenced stations. Estimate for an individual substation will be developed during initial funding based on existing infrastructure at a substation. For example : the type of tap changer control, ability to reuse existing conduits to pull fiber, and the capability to use existing communication device to communicate with new device will all be identified to improve the accuracy of the estimate and control costs going forward.

The LTC DSCADA upgrade for each substation / transformer location is expected to follow one of three possible cost scenarios. Accordingly, the cost for each scenario will vary depending on the actual infrastructure and equipment condition. The funding provided by this Initial PAF will facilitate work scope definition at each substation. Some may need conduit installation; some may simply only need wiring and some a new tap changer control and / or combination of this items. All will require testing and commissioning. As a result of these scenarios, there are three (DME) estimates that reflect the different costs in cost ascending value:

1. LTC control upgrade only, existing control & conduit (least cost)
2. LTC control upgrade, new conduit, existing control
3. LTC Control upgrade, new control & conduit (most cost)

Table -1

Cost of D-SCADA LTC Project Scenarios

Description	1. Upgrade Only – existing Control & Conduit	2. Upgrade & Conduit – existing Control	3. Upgrade, New Control & Conduit
ROW / Easements / Land purchases			
Environmental Approvals / Permits			
Outreach	$1,900	$2,200	$3,200
Siting Approvals / Permits			
Engineering / Design	$10,400	$12,600	$17,600
Materials (Eversource purchased)	$18,400	$18,600	$26,200
Construction (incl. matl's by contractors)	$69,800	$90,900	$126,100
Testing / Commissioning	$61,300	$61,300	$94,200
PMT Project Mgmt Team	$10,500	$10,500	$10,500
Removals	$2,300	$2,300	$2,300
Other			
Risks	$63,200	$63,200	$71,000
Project Directs Total w/Risks	**$237,800**	**$261,600**	**$351,100**
Indirects/Overhead	$117,200	$134,000	$188,400
AFUDC	$9,600	$10,700	$14,600
Project Total - Baseline Budget	**$364,600**	**$406,300**	**$554,100**
Contingency			
Project Total - Funding Approval Level	**$364,600**	**$406,300**	**$554,100**
Reimbursables/Customer Contribution	**Not applicable**	**Not applicable**	**Not applicable**
Project Total (less reimbursables)	**$364,600**	**$406,300**	**$554,100**

Technical Justification:

Project Need Statement

The CT DSCADA LTC radio system is obsolete and needs replacement. The radio system is [redacted] can be found in Figure 1. Pictures of the obsolete radio receivers can be found in Attachment 2.

Project Objectives

[redacted]

Project Scope

[redacted]

[redacted]

- Detailed scoping and evaluation checklist for substation transformers will determine the need for the following:
    1. Upgrade the existing Tap Changer Controllers with new Beckwith DSCADA capable model M-2001D Digital Tap Changer Control. Not applicable to existing M-2001 controls

2. Install DCSADA LTC cabinet on the transformers. Grounding to be modified as necessary for the proper connections to the DSCADA cabinet
3. Install new conduit between transformer and control house switchgear. Not required if existing conduit can be used or if a spare conduit is available for a new crush resistant fiber cable
4. Install crush resistant fiber from DSCADA equipment in the control house / switchgear to the SEL-2240 Axion inside the LTC DSCADA cabinet
5. Install a new fiber patch panel
6. Install a new 43AMR three position switch ("AUTO/MAN/REMOTE"). LTC Auto/Manual control scheme to be updated to include this new switch
7. The LTC tap position monitor to be wired into the new LTC position indicator device and back to the SEL-2420 Axion
8. Available transformer alarms will be modified and rewired into the SEL-2420 Axion.

- Development of Engineering Project Approval Committee (EPAC) documents
- Constructability Walkdowns including qualified representatives from Engineering (Field/SCADA/Telecom), Project Management, Operations, and Construction departments
- Outage planning and the development of single contingency load loss (SCLL) mitigation plans as needed

Background / Justification

[redacted]

Business Process and / or Technical Improvements:

[redacted]

Alternatives Considered

Eversource evaluated the following three alternatives:

1. [redacted] **(Preferred Solution)**

   Cost estimate $554,100 (planning grade)

2. [redacted]. **(This option is not recommended)**

3. [redacted]. **(This option is not recommended)**

Project Schedule

All project releases in the program will have station specific P6 schedules. The following program schedule lists milestones leading to the start of construction.

Milestone/Phase Name	Estimated Date
SDC Meeting – Operations Program Level Approval with Initial Funding	3/17/2021
Revised with Comments – Operations Program Level Approval with Initial Funding	5/11/2021
SDC / EPAC Meeting Program Approval (email)	5/11/2021
Program Construction Start	Q3 2021
Program Construction Completion	Q4 2030

Due to potential financial and man-hour restrictions, this project will spread 99 LTC transformers over ten years for construction from 2021 – 2030. Engineering and material purchase will be done annually. Each transformer LTC upgrade on average may cost approximately $450K per unit. Justification for the length of this proposed 10-year program is cost. The program's duration can be adjusted if it is determined that the cost per unit is acceptable, and an increased investment in the program over other system needs is justified.

Planned LTC Upgrade Releases for 2021

Substation Name	Project Number	LTC Control Count	Equip Position
[redacted]	CS00430	[redacted]	
	CS00430		
	CS00430		
	CS00433		
	CS00433		
	CS00433		
	CS00432		
	CS00432		
	CS00432		
TOTAL UNITS			

Planned LTC Releases for 2022

Substation Name	Project Number	LTC Control Count	Equip Position
[redacted]	TBD	[redacted]	[redacted]
	TBD		
	CS00495		
	CS00495		
	CS00496		
	CS00496		
	CS00499		
	CS00499		
	CS00500		
	CS00500		
	CS00501		
	CS00501		
	CS00501		
TOTAL UNITS			

Planned LTC Releases for 2023

Substation Name	Project Number	LTC Control Count	Equip Position
[redacted]	TBD	[redacted]	[redacted]
	TBD		
	TBD		
	TBD		
	TBD		
	TBD		
	TBD		
	TBD		
TOTAL UNITS			

Planned Number of LTC Releases (Unspecified Stations) for Years 2024 – 2030

Engineer and Upgrade LTC	Estimated In Service Date
[redacted]	[redacted]
	TOTAL UNITS

Regulatory Approvals

No advance regulatory approval is required for this project.

Risks and Risk Mitigation Plans

[redacted]

[redacted]

As noted in Table - 1, an increased risk associated with Option 3 - Upgrade, New Control & Conduit is primarily because of unforeseen subgrade interferences or hazards associated with excavations in stations. Options 1 and 2 do not require excavation work in stations.

Contingency

None at the Program level.

References

ISO-NE Operating Procedure No. 13 – Standards for Voltage Reduction and Load Shedding Capability.

Attachments

Figure1
CONVEX LMS System



ESTIMATE SUMARY

Project Title: EVERSOURCE CT - DSCADA LTC CONTROLS UPGRADE
Proiect Mar/Lead:
Project Number:CS00407
WO & Task #:
Est. Revision #
Estimate Type - Station work

Estimate By: [redacted]
Date of Estimate: 02/09/2021
ISD:12/31/2021
Estimate #

Template Revision # 01.53

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026
1	ROW / Easements / Land purchases										
2	Environmental Approvals / Permits										
3	Outreach	$1,900	0.8%	0.5%		$1,900					
4	Siting Approvals / Permits										
5	Engineering / Design	$10,400	4.4%	2.9%		$10,400					
6	Materials (Eversource purchased)	$18,400	7.7%	5.0%		$18,400					
7	Construction (incl matl's by	$69,800	29.4%	19.1%		$69,800					
8	Testing / Commissioning	$61,300	25.8%	16.8%		$61,300					
9	PMT Project Mgmt Team	$10,500	4.4%	2.9%		$10,500					
10	Removals	$2,300	1.0%	0.6%		$2,300					
11	Other										
12	Risks	$63,200	26.6%	17.3%		$63,200					
	Project Directs Total w/Risks	**$237,800**	100.0%	65.2%		**$237,800**					
13	Indirects/Overhead	$117,200		32.1%		$117,200					
14	AFUDC	$9,600		2.6%		$9,600					
	Project Total - Baseline Budget	**$364,600**		100.0%		**$364,600**					
15	Contingency										
	Project Total - Funding Approval Level	**$364,600**		100.0%		**$364,600**					
16	Reimbursables/Customer Contribution										
	Project Total (less reimbursables)	**$364,600**				**$364,600**					
	Amount of Escalation included above										
6	Total materials - Eversource	$18,400				$18,400					
	Total materials - Contractor	$5,600				$5,600					
	Total materials	$24,000				$24,000					
	NOTE: Risk / Contingency is 21% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)										

Estimate Range	**-25%**	-	**25%**	
	$273,000	-	**$456,000**	

COMMENTS:

Project Scope:

[redacted]

Indirect rates based on: 11 - CT . Station work

Major material

1. One (1) CABINET, ENCLOSURE, LTC DSCADA, AL,24 IN X 18 IN X 14 IN, ANNUNCIATOR
2. One (1) MONITOR, LTC Tap position indicator device
3. 43AMR 3 position switch ("AUTO/MAN/REMOTE")

Notes:

1. Test manhours based on test contractor quote per LTC/transformer
2. Electrical construction manhours based on electrical contractor quote per LTC/transformer
3. Estimate assumes existing conduits can be used to install crush proof fiber between the transformer and the control house or switchgear. An estimated cost of $1,322 per ft to install conduit between transformer and control house or switchgear should be added to the estimate if required
4. Material quote based on previous projects

RISKS

Severe Weather, Delays, OT	$	13.200
Communication System Upgrade	$	50.000

ESTIMATE SUMARY

Project Title: EVERSOURCE CT - DSCADA LTC CONTROLS UPGRADE
Proiect Mar/Lead:
Project Number:CS00407
WO & Task #:
Est. Revision #
Estimate Type - Station work

Estimate By: [redacted]
Date of Estimate: 02/09/2021
ISD:12/31/2021
Estimate #

Template Revision # 01.53

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026
1	ROW / Easements / Land purchases										
2	Environmental Approvals / Permits										
3	Outreach	$2,200	0.8%	0.5%		$2,200					
4	Siting Approvals / Permits										
5	Engineering / Design	$12,600	4.8%	3.1%		$12,600					
6	Materials (Eversource purchased)	$18,600	7.1%	4.6%		$18,600					
7	Construction (incl matl's by	$90,900	34.7%	22.4%		$90,900					
8	Testing / Commissioning	$61,300	23.4%	15.1%		$61,300					
9	PMT Project Mgmt Team	$10,500	4.0%	2.6%		$10,500					
10	Removals	$2,300	0.9%	0.6%		$2,300					
11	Other										
12	Risks	$63,200	24.2%	15.6%		$63,200					
	Project Directs Total w/Risks	**$261,600**	100.0%	64.4%		**$261,600**					
13	Indirects/Overhead	$134,000		33.0%		$134,000					
14	AFUDC	$10,700		2.6%		$10,700					
	Project Total - Baseline Budget	**$406,300**		100.0%		**$406,300**					
15	Contingency										
	Project Total - Funding Approval Level	**$406,300**		100.0%		**$406,300**					
16	Reimbursables/Customer Contribution										
	Project Total (less reimbursables)	**$406,300**				**$406,300**					
	Amount of Escalation included above										
6	Total materials - Eversource	$18,600				$18,600					
	Total materials - Contractor	$7,800				$7,800					
	Total materials	$26,400				$26,400					
	NOTE: Risk / Contingency is 18.4% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)										

Estimate Range	**-25%**	-	**25%**	
	$305,000	-	**$508,000**	

COMMENTS:

[redacted]

Indirect rates based on: 11 - CT . Station work

Major material

1. One (1) CABINET, ENCLOSURE, LTC DSCADA, AL,24 IN X 18 IN X 14 IN, ANNUNCIATOR
2. One (1) MONITOR, LTC Tap position indicator device
3. 43AMR 3 position switch ("AUTO/MAN/REMOTE")

Notes:

1. Test manhours based on test contractor quote per LTC/transformer
2. Electrical construction manhours based on electrical contractor quote per LTC/transformer
3. Estimate assumes existing conduits can be used to install crush proof fiber between the transformer and the control house or switchgear. An estimated cost of $1,322 per ft to install conduit between transformer and control house or switchgear should be added to the estimate if required
4. Material quote based on previous projects

RISKS

Severe Weather, Delays, OT	$	13.200
Communication System Upgrade	$	50.000

ESTIMATE SUMMARY

Project Title: EVERSOURCE CT - DSCADA LTC CONTROLS UPGRADE
Project Mgr/Lead:
Project Number:CS00407
WO & Task #:
Est. Revision #
Estimate Type - Station work

Estimate By: [redacted]
Date of Estimate: 02/09/2021
ISD:12/31/2021
Estimate #

Template Revision # 01.53

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026
1	ROW / Easements / Land purchases										
2	Environmental Approvals / Permits										
3	Outreach	$3,200	0.9%	0.6%		$3,200					
4	Siting Approvals / Permits										
5	Engineering / Design	$17,600	5.0%	3.2%		$17,600					
6	Materials (Eversource purchased)	$26,200	7.5%	4.7%		$26,200					
7	Construction (incl matl's by	$126,100	35.9%	22.8%		$126,100					
8	Testing / Commissioning	$94,200	26.8%	17.0%		$94,200					
9	PMT Project Mgmt Team	$10,500	3.0%	1.9%		$10,500					
10	Removals	$2,300	0.7%	0.4%		$2,300					
11	Other										
12	Risks	$71,000	20.2%	12.8%		$71,000					
	Project Directs Total w/Risks	**$351,100**	100.0%	63.4%		**$351,100**					
13	Indirects/Overhead	$188,400		34.0%		$188,400					
14	AFUDC	$14,600		2.6%		$14,600					
	Project Total - Baseline Budget	**$554,100**		100.0%		**$554,100**					
15	Contingency										
	Project Total - Funding Approval Level	**$554,100**		100.0%		**$554,100**					
16	Reimbursables/Customer Contribution										
	Project Total (less reimbursables)	**$554,100**				**$554,100**					
	Amount of Escalation included above										
6	Total materials - Eversource	$26,200				$26,200					
	Total materials - Contractor	$9,500				$9,500					
	Total materials	$35,700				$35,700					
	NOTE: Risk / Contingency is 14.7% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)										

Estimate Range	**-25%**	-	**25%**	
	$416,000	-	**$693,000**	

COMMENTS:

[redacted]

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

Major material

1. One (1) CABINET, ENCLOSURE, LTC DSCADA, AL,24 IN X 18 IN X 14 IN, ANNUNCIATOR
2. One (1) MONITOR, LTC Tap position indicator device
3. One (1) Beckwith M-2001D Digital Tapchanger Control and adapter panel
4. 43AMR 3 position switch ("AUTO/MAN/REMOTE")

Notes:

1. Test manhours based on test contractor quote per LTC/transformer
2. Electrical construction manhours based on electrical contractor quote per LTC/transformer
3. Civil manhours based on civil contractor quote to excavate 100 ft between transformer and control house or switchgear
4. Material quote based on previous projects

RISKS

Severe Weather, Delays, OT	$	21,000
Communication System Upgrade	$	50,000

Estimate Review Checklist

Type Project to be reviewed: Replace obsolete Radio Controlled sytem on the Transformer. Substation work no conduit, no controls alternative 1

Job Order: CS00407

Requestor: [redacted]

Work Order:

Date of Est: 2/9/21

Est#: Review Number C-21-136

Revsion of Est: 0

Job Description: Replace obsolete Radio controlled equipment.

Date of Review: 3/4/21

Estimator: [redacted]

Level of Estimate: Planning

Substation type project	Recommended Risk
Bus, Switch, Insulator, Misc Eqt Upgrades	Planning 7-12%

OH Project	Underground Project

Level Of Review	Purpose of Estimate
Full Review	Planning Study

Items Checked

Indirect Rates Correct? ☐ Yes ☑ No
Minor increases in some rates in new template.

Manpower/Mandays sufficient for project? ☑ Yes ☐ No
If No, explain:

AFUDC rates are current and correctly applied? ☐ Yes ☑ No
Minor changes in AFUDC rate on new template.

Scope deliverables match expectations for est. class? ☑ Yes ☐ No
If No, explain:

PM Support sufficient for proj? ☑ Yes ☐ No
If No System planning or scheduling required.

Milestones and schedule ISD match scope? ☐ Yes ☑ No
Milestones not completed.

Prior spending accounted for? ☐ Yes ☑ No
No priors reported to date.

Escalation allocated correctly across project time frame? ☐ Yes ☑ No
No escalation included project program will be for next ten years and estimate is for work done this year only.

Contingency and Risk in line with est. type? ☐ Yes ☑ No
No contingrency applied.

Construction Rep and LCE sufficient for project? ☑ Yes ☐ No
If No, explain:

Recommendations

Check AFUDC rate minor drop in CT D rate.

Check indirect rates to see if adjustment would increase accuracy.

Add Project management planning and system scheduling.

Adjust risk and contingency. Risk is at 17.3% of total change by moving 5.3% to Contingency and adjusting risk to 12%

Estimate Review Checklist

Type Project to be reviewed: Replace obsolete Radio Controlled sytem on the Transformer. Substation work new conduit, no controls alternative 2

Job Order: CS00407

Requestor: [redacted]

Work Order:

Date of Est: 2/9/21

Est#: Review Number C-21-136

Revsion of Est: 0

Job Description: Replace obsolete Radio controlled equipment.

Date of Review: 3/4/21

Estimator: [redacted]

Level of Estimate: Planning

Substation type project	Recommended Risk
Bus, Switch, Insulator, Misc Eqt Upgrades	Planning 7-12%

OH Project	Underground Project

Level Of Review	Purpose of Estimate
Full Review	Planning Study

Items Checked

Indirect Rates Correct? ☐ Yes ☑ No
Minor increases in some rates in new template.

Manpower/Mandays sufficient for project? ☑ Yes ☐ No
If No, explain:

AFUDC rates are current and correctly applied? ☐ Yes ☑ No
Minor changes in AFUDC rate on new template.

Scope deliverables match expectations for est. class? ☑ Yes ☐ No
If No, explain:

PM Support sufficient for proj? ☑ Yes ☐ No
If No System planning or scheduling required.

Milestones and schedule ISD match scope? ☐ Yes ☑ No
Milestones not completed.

Prior spending accounted for? ☐ Yes ☑ No
No priors reported to date.

Escalation allocated correctly across project time frame? ☐ Yes ☑ No
No escalation included project program will be for next ten years and estimate is for work done this year only.

Contingency and Risk in line with est. type? ☐ Yes ☑ No
No contingrency applied.

Construction Rep and LCE sufficient for project? ☑ Yes ☐ No
If No, explain:

Recommendations

Check AFUDC rate minor drop in CT D rate.

Check indirect rates to see if adjustment would increase accuracy.

Add Project management planning and system scheduling.

Adjust risk and contingency. Risk presently at 15.6% adjust risk to 11% and adjust contingency to 4.6% of total project.

Estimate Review Checklist

Type Project to be reviewed: Replace obsolete Radio Controlled sytem on the Transformer. Substation work new conduit and controls alternative 3

Job Order: CS00407

Requestor: [redacted]

Work Order:

Date of Est: 2/9/21

Est#: Review Number C-21-136

Revsion of Est: 0

Job Description: Replace obsolete Radio controlled equipment.

Date of Review: 3/4/21

Estimator: [redacted]

Level of Estimate: Planning

Substation type project	Recommended Risk
Bus, Switch, Insulator, Misc Eqt Upgrades	Planning 7-12%

OH Project	Underground Project

Level Of Review	Purpose of Estimate
Full Review	Planning Study

Items Checked

Indirect Rates Correct? ☐ Yes ☑ No
Minor increases in some rates in new template.

AFUDC rates are current and correctly applied? ☐ Yes ☑ No
Minor changes in AFUDC rate on new template.

PM Support sufficient for proj? ☑ Yes ☐ No
If No System planning or scheduling required.

Prior spending accounted for? ☐ Yes ☑ No
No priors reported to date.

Contingency and Risk in line with est. type? ☐ Yes ☑ No
No contingrency applied.

Manpower/Mandays sufficient for project? ☑ Yes ☐ No
If No, explain:

Scope deliverables match expectations for est. class? ☑ Yes ☐ No
If No, explain:

Milestones and schedule ISD match scope? ☐ Yes ☑ No
Milestones not completed.

Escalation allocated correctly across project time frame? ☐ Yes ☑ No
No escalation included project program will be for next ten years and estimate is for work done this year only.

Construction Rep and LCE sufficient for project? ☑ Yes ☐ No
If No, explain:

Recommendations

Check AFUDC rate minor drop in CT D rate.

Check indirect rates to see if adjustment would increase accuracy.

Add Project management planning and system scheduling.

Adjust risk and contingency. Risk currently at 12.8% adjust risk to 10% of total and add contingency to 4% of total.

Attachment 2 – Substation – Transformer List

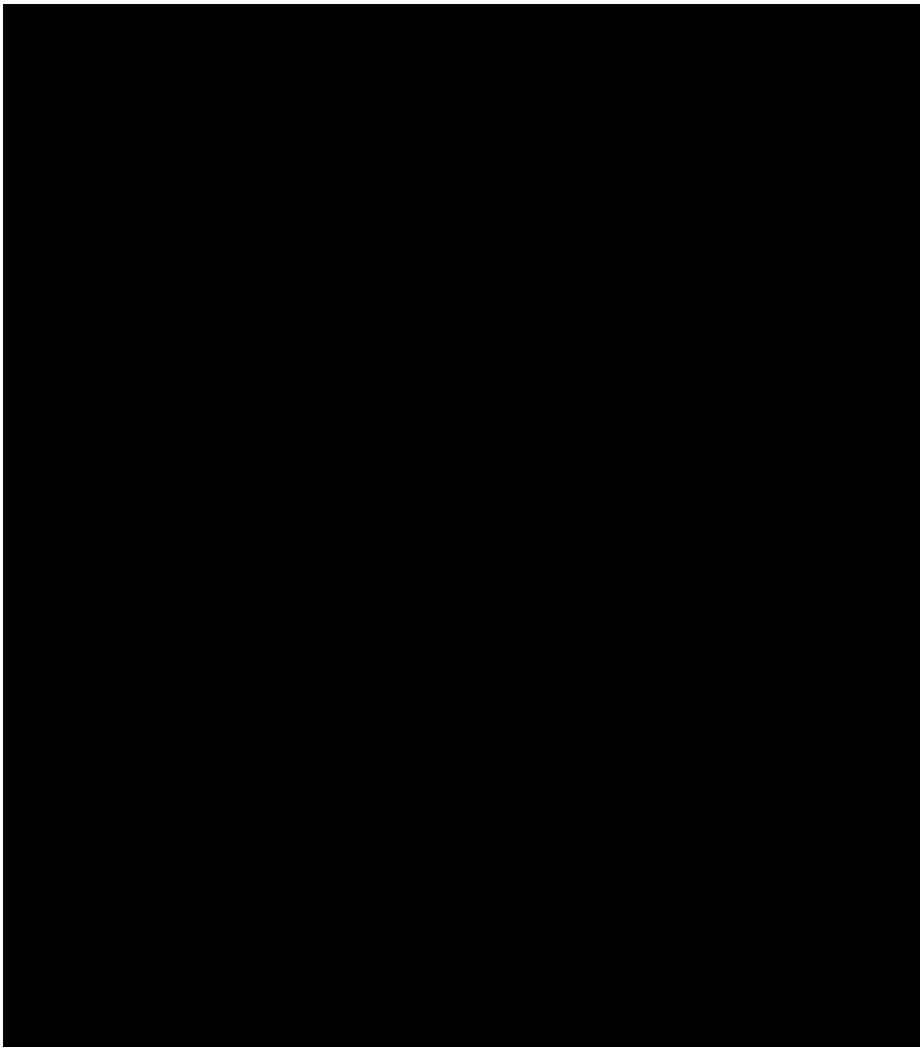
[redacted]

ATTACHMENT 3 - Photos

Pictures of an existing radio receiver that is mounted on the LTCs:



Regency Analog Receiver



New D-DSCADA LTC (RTU) Cabinet that is mounted on the Transformer:

