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Program Release Form

Approved at November 23, 2021 EPAC

Link to Meeting Minutes

Date Prepared: 11/15/2021	**Project Title: DSCADA LTC Controls Upgrade** [redacted]
Company: Eversource CT	**Facility Name:** [redacted]
Organization: Asset Management	**Project Number: CS00500**
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: $986K	**Estimated in service date(s): 05/31/2022**
	Facility Type (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution

Executive Summary

This Program Release is requesting dollar authorization in accordance with the program level criteria specified in Program Level PAF - DSCADA 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 $986K to install Distribution Supervisory Control and Data Acquisition (DSCADA) Load Tap Changer (LTC) Automation on the [redacted]

[redacted]

The Program Level PAF CS00407 had $250K of initial funding approved in PowerPlan on 5/25/2021. As of 10/19/2021, approximately $46K has been charged to WO CS009036, under

the previously established program CS00090 as noted in the Program Level PAF, for engineering and design at [redacted]. These funds will be journaled to this new release upon approval.

Constructability Review

A constructability review was performed on 07/29/2021 (See Attachment C - Substation Constructability Review Form - [redacted]

Project Scope

[redacted]

Scope of Work

[redacted]

Major Material

1. Two (2) LTC DSCADA Cabinet RTUs, one for each transformer
2. Two (2) LTC tap position monitors, one for each transformer
3. Two (2) M-2001D Beckwith tap changer controls with Adapter Panels

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	$ 6	$1	($5)
4. Siting Approvals / Permits	$	$	$
5. Engineering / Design	$36	$52	$16
6. Materials (Eversource purchased)	$52	$48	($4)
7. Construction (incl matl's by contractors)	$252	$253	$1
8. Testing / Commissioning	$188	$146	($42)
9. Project Mgmt Team	$22	$8	($14)
10. Removals	$4	$4	$
11. Other	$	$	$
12. Risks	$142	$72	($70)
SUBTOTAL DIRECTS W/ RISKS	**$702**	**$584**	**($118)**
13. Indirects/Overhead	$376	$353	($23)
14. AFUDC	$30	$25	($5)
PROJECT TOTAL – BASELINE BUDGET	**$1,108**	**$962**	**($146)**
15. Contingency	$	**$24**	**$24**
TOTAL CAPITAL REQUEST	**$1,108**	**$986**	**($122)**
16. Reimbursables/Customer Contribution	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$1,108**	**$986**	**($122)**
O&M	$	**$**	
Total Request	**$1,108**	**$986**	**($122)**

*CT program unit cost (Option #3) is $554,100 per transformer (upgrade, new conduit, and new control) and has been used in the unitized release PAF cost for the 1Q-1X and 1Q-2X 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: – ($5K)** Unit price per transformer reflects outreach required at one station. A savings is realized as any required outreach for two (2) transformers can be accomplished simultaneously.
4. **Siting Approvals / Permits: $0 –** No changes from the Program Level PAF.
5. **Engineering / Design: $16K -** Actual engineering/design costs of $46K have been charged to the existing WO under project number CS0009036. This prior charge accounts for 88% of the required engineering. An estimated $6K is required to complete the remainder of the engineering work.
6. **Materials (by Eversource): ($4K) -** No major changes from Program Level PAF.
7. **Construction (including materials supplied by contractors): $1K** – No major changes from the Program level PAF.
8. **Testing / Commissioning: ($42K) –** Savings recognized in economies of scale by using same test team personnel to test and commission the new DSCADA installation.
9. **Project Management Team: ($14K)** Savings in economies of scale.
10. **Removals: $0 –** No changes from the Program Level PAF.
11. **Other: $0 –** No changes from the Program Level PAF
12. **Risk: ($70K) –** Savings recognized in economies of scale. Lower risk in civil work by installing conduits in the same trench.
13. **Indirects/Overhead: ($23K) –** Indirects are proportional to direct costs.
14. **AFUDC: ($5K) –** AFUDC is proportional to direct costs.
15. **Contingency: $25K –** Contingency included to account for unique project unknowns.
16. **Reimbursables/Customer Contribution: $0 –** No changes from the Program Level PAF.

O&M: $0 - No changes from the Program Level PAF.

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Project Costs Summary for (2) transformers

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	2022	Total
1. ROW / Easements / Land Acquisition	$		$	$	$
2. Environmental Approvals / Permits	$		$	$	$
3. Outreach	$		$	$1	$1
4. Siting Approvals / Permits	$		$	$	$
5. Engineering / Design	$	$46	$6	$	$52
6. Materials (Eversource purchased)	$		$45	$2	$48
7. Construction (incl matl's by contractors)	$		$	$253	$253
8. Testing / Commissioning	$		$	$146	$146
9. Project Mgmt Team	$		$	$8	$8
10. Removals	$		$	$4	$4
11. Other	$		$	$	$
12. *Risks	$		$	$72	$72
SUBTOTAL DIRECTS W/ RISKS	**$250**	**$46**	**$52**	$486	$584
13. Indirects/Overhead	$		$22	$331	$353
14. AFUDC	$		$2	$23	$24
PROJECT TOTAL – BASELINE BUDGET	**$250**	**$46**	**$76**	**$840**	**$962**
15. Contingency	**$**	**$**	**$**	**$24**	**$24**
TOTAL CAPITAL REQUEST	**$250**	**$46**	**$76**	**$864**	**$986**
16. Reimbursables/Customer Contribution	$	$	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$250**	**$46**	**$76**	**$864**	**$986**
O&M	$		$		$
TOTAL REQUEST	**$250**	**$46**	**$76**	**$864**	**$986**

Risk of $72K included for potential underground obstructions ($16K), severe weather delays, OT ($36K), and design development ($20K).

Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	2022	Total
ST Labor		$46	$6	$38	$90
OT Labor		$	$	$	$
Outside Services Labor		$	$	$368	$371
Materials*		$	$45	$2	$48
Removals		$	$	$4	$4
Other		$	$0	$98	$99
Indirects		$	$22	$331	$353
AFUDC		$	$2	$23	$25
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$250**	**$46**	**$76**	**$864**	**$986**

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

Future Financial Impacts:

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

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

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

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

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: N/A
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):

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 in the estimate for potential underground obstructions, severe weather, delays, and overtime and design development.

Contingency

$24K contingency is included for project unknowns specific to this release.

Project Schedule

Milestone/Phase Name	Estimated Dates
Program Level Initial Funding Approval (CS00407)	February 2021
EPAC Meeting – Full Funding Release Presentation	11/23/2021
Engineering IFC	December 2021
Material Received	February 2022
Construction Start	February 2022
Construction Completion	May 2022
ISD	05/31/2022

See Attachment B for the P6 schedule.

Attachments

- Attachment A - [redacted]-DSCADA LTC Upgrade – Estimate - CS00500
- Attachment B - CS00500 - [redacted] DSCADA - P6
- Attachment C - Substation Constructability Review Form - [redacted]
- Attachment D - [redacted] Nomenclature
- Attachment E - Program Level PAF - DSCADA Load Tap Changer (LTC) Receivers Program Upgrades CS00407

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Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] - DSCADA LTC Controls Upgrade	**Project Number: CS00500**
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

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Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] - DSCADA LTC Controls Upgrade	**Project Number: CS00500**

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 SUMMARY

Project Title [redacted] - DSCADA LTC UPGRADE
Project Mgr: [redacted]
Project Number: CS00500
WO & Task #: CS009036
Estimate revision #: 00
Estimate Type - Station work

Estimate #: C-21-727
Date of Estimate:10/14/2021
Estimate done by [redacted]
In Service date (ISD): 12/30/2022

Template Revision # 01.00b

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Directs	% of Total	Priors	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
1	ROW / Easements / Land purchases														
2	Environmental Approvals / Permits														
3	Outreach	$900	0.2%	0.1%		$100	$800								
4	Siting Approvals / Permits														
5	Engineering / Design	$52,300	9.0%	5.3%	$46,200	$6,100									
6	Materials (Eversource purchased)	$47,600	8.2%	4.8%		$45,300	$2,300								
7	Construction (Incl mat'ls by contractors)	$253,300	43.4%	25.7%			$253,300								
8	Testing / Commissioning	$146,300	25.1%	14.8%			$146,300								
9	PMT Project Mgmt Team	$7,800	1.3%	0.8%			$7,800								
10	Removals	$3,600	0.6%	0.4%			$3,600								
11	Other														
12	Risks	$72,000	12.3%	7.3%			$72,000								
135															
	Project Directs Total w/Risks	**$583,800**	100.0%	59.2%	**$46,200**	**$61,500**	**$485,900**								
13	Indirects/Overhead	$353,300		35.8%		$22,300	$331,000								
14	AFUDC	$24,900		2.5%		$2,000	$22,900								
135															
	Project Total - Baseline Budget	**$961,800**		97.5%	**$46,200**	**$76,800**	**$838,800**								
15	Contingency	$24,500		2.5%			$24,500								
	Project Total - Funding Approval Level	**$986,300**		100.0%	**$46,200**	**$76,800**	**$864,300**								
16	Reimbursables/Customer Contribution														
	Project Total (less reimbursables)	**$986,300**			**$46,200**	**$76,800**	**$864,300**								
	Cost per key qty (if appl)	493,150	$'s / EA												
	Amount of Escalation included above	$21,700					$21,700								
6	Total materials - Eversource	$47,600				$45,300	$2,300								
	Total materials - Contractor														
	Total materials	$47,600				$45,300	$2,300								

NOTE: Risk / Contingency is 10.8% of Project Total Costs (incl escal/Indirects/AFUDC but excl reimb.)

Estimate Range

-25%		25%
$740,000		**$1,233,000**

All Estimate Summary for PPI Calc (escalation separate)

Estimate #: C-21-727
Date of Estimate:10/14/2021

Project Number: CS00500
WO & Task #: CS009036

		TOTAL w/ escal broken out
ROW / Easements / Land purchas	$	-
Environmental Approvals / Permit	$	-
Outreach	$	900
Siting Approvals / Permits	$	100
Engineering / Design	$	52,300
Materials (Eversource purchased)	$	47,500
Construction (Incl mat'l's by contr	$	245,900
Testing / Commissioning	$	142,000
PMT Project Mgmt Team	$	7,300
Removals	$	3,500
Other	$	-
Risks	$	72,000
		$571,500
Indirects/Overhead	$	343 800
AFUDC	$	24 900
	$	-
		$840,000
	$	-
Contingency	$	24,500
		$864,500
	$	-
	$	-
	$	-
		$864,500
	$	21,700
Excel total		**$886,200**
Check total		-$100

COMMENTS:

Project Scope:
Key qty's and UOM (tie to inputs on est sheets) 2 EA

[redacted]

- Two(02) CABINET, ENCLOSURE, LTC DSCADA, AL,24 IN X 18 IN X 14 IN .
- Two (02) MONITOR, LTC TAP POS, PROGRAMMABLE, 120VAC, 4 TO 20 MA ANALOG OUTPUT, RS-232.
- Two (02) M-3001D Beckwith tap changer controls.

Assumptions/Clarifications:

Indirect rates based on: 11 - CT Station work

Note

1.This estimate assumes all construction (electrical, test and civil) will be outsourced. each transformer will need to be de-energized for 5 days for installation, and testing will take place partially during the outage and upon energization.
2.The estimate include manhours for Lead Commission Engineer, Construction Representative, Electrical, Test and Civil
3.Estimated risks are assumed to be 7% of the project total cost as per the estimating group recommendations
4.DSCADA 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-3260 Axion.

RISKS

Potential UG Obstructions	$	16 000
Severe Weather. Delays. OT	$	36 000
Design development	$	20 000

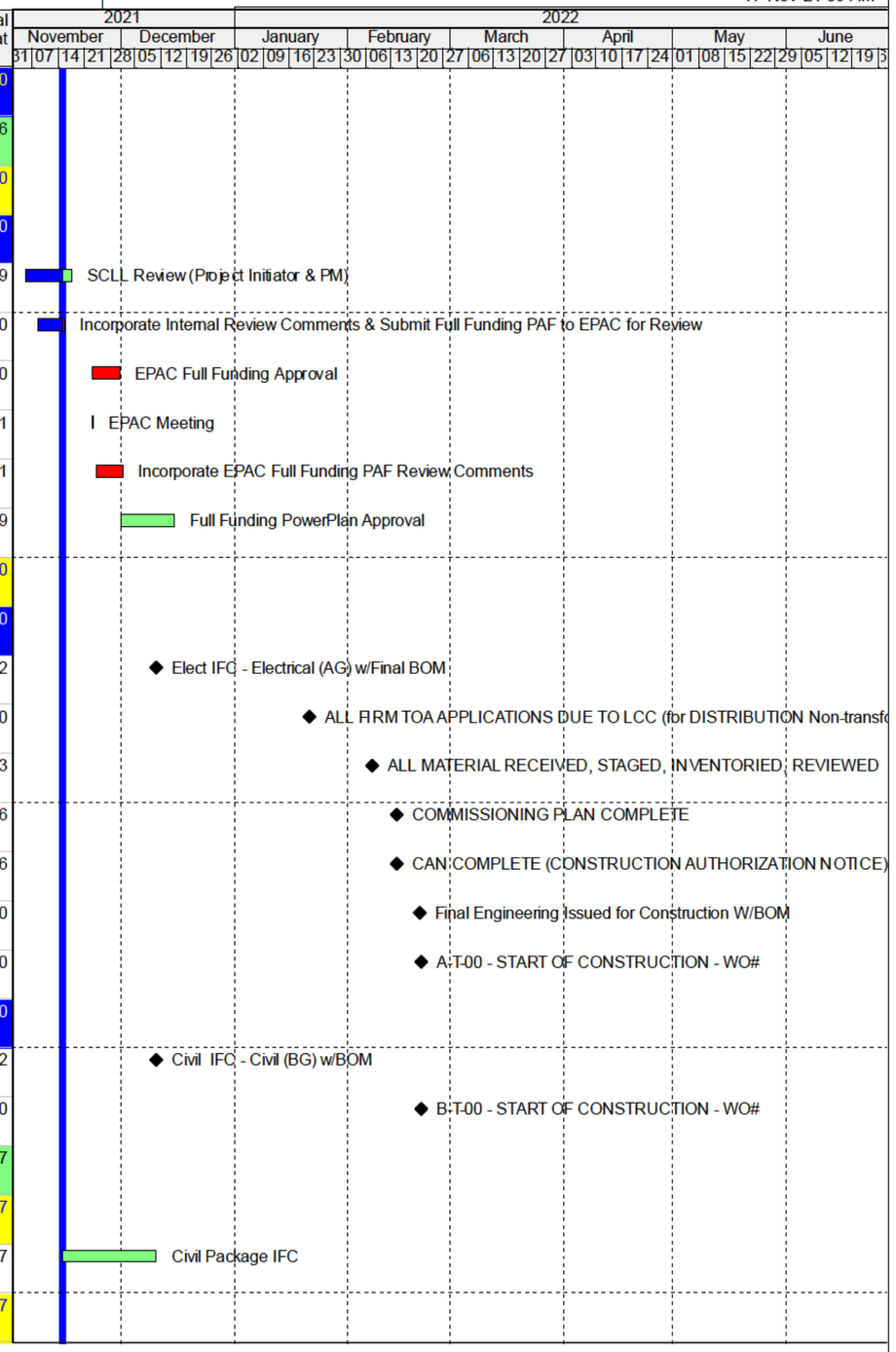
UNESCALATED LINE ITEM DOLLARS

Project Number CS00500
Date of Estimate 10/14/2021
Estimate revision # 00

Escalation Rate — E Rate $ [redacted]

CSTXX-CONSTRUCTION	R		Prior Mhrs	Prior DOLLARS	[redacted] 021 DOLLARS	[redacted]	2022 DOLLARS	[redacted]	TOTAL DOLLARS
Electrical Construction	LT						$24,600		$24,600
General Construction	LT								
SCADA / Automation	LT						$4,240		$4,240
Telecom - Field	LT								
Construction Reps (internal)	LT								
Support Switch/Tag	LT						$6,360		$6,360
Other (specify)	LT								
Other (specify)	LT								
Other (specify)	LT								
LT Total							$35,200		$35,200
Employee Expenses	AE	5%					$1,760		$1,760
Construction Purchased Material	AM	1%					$2,221		$2,221
Outside Construction Vendor	AQ						$197,454		$197,454
Sales tax on Constr. Vendor									
Vehicles (now in indirects section)	AV								
Inspection services (Outside Vendor)	AQ								
Construction Rep (Outside vendor)	AQ						$11,520		$11,520
Rents and Leases	BR								
CSTXX Subtotal							$248,155		$248,155
Escalation									
CSTXX Total							$248,155		$248,155
ENRXX-TG ENGINEERING/DESIGN									
Project Services/Drafting	LT			$848					$848
T- Line Engineering/Design	LT								
D- Street Engineering/Design	LT								
Civil Engineering/Design	LT			$1,272					$1,272
Substation (T) Engineering/Design	LT								
Substation (D) Engineering/Design	LT			$848					$848
Protection & Controls Engineering	LT			$1,272					$1,272
Survey Engineering	LT								
SCADA / Automation Engineering	LT								
Telecom Engineering	LT			$636					$636
Other - PP Actuals	LT		$46,176						**$46,176**
Other - Project Engineer	LT			$954					$954
LT Total			$46,176	$5,830					$52,006
Employee Expenses	AE	5%		$292					$292
Contractor Engineering - T-Lines	AQ								
Contractor Engineering - D-Street	AQ								
Contractor Engineering - T-Station	AQ								
Contractor Engineering - D-Station	AQ								
Contractor Engineering - P&C	AQ								
Contractor Engineering - Survey	AQ								
Contractor Engineering - SCADA / Automation	AQ								
Contractor Engineering - Telecom	AQ								
Contractor Engineering - Specify	AQ								
Contractor Engineering - Specify	AQ								
Contractor Engineering - Specify	AQ								
Vehicles (now in indirects section)	AV								
ENRXX Subtotal			$46,176	$6,122					$52,298
Escalation									
ENRXX Total			$46,176	$6,122					$52,298
LNDXX-TG LAND									
Real Estate	LT								
Employee Expenses	AE	5%							
Purchase Land	AM								
Vehicles (now in indirects section)	AV								
Fees and Payments	BF								
LNDXX Subtotal									
Escalation									
LNDXX Total									
MATXX-TG MATERIAL									
Eversource	AM			$43,600					$43,600
Outside Services	AM								
	AM								
Freight									
Sales Tax Eversouce/outside services	3.9%	3.9%		$1,700					$1,700
Other									
MATXX Subtotal				$45,300					$45,300
Escalation									
MATXX Total				$45,300					$45,300
PSMXX-PROJECT MANAGER & SUPPORT									
Project Management (PM)	LT								
Project Planning/Cost (IP)	LT								
Contracts/Purchasing (C/P)	LT								
System Planning	LT								
Environmental	LT								
SCS - Notification	LT			$5			$39		$44
Legal	LT								
Estimating	LT						$1,272		$1,272
Siting - Local Zoning	LT						$100		$100
Asset Management	LT								
Other -	LT								
Other -	LT								
Other -	LT								
Other -	LT								
LT Total				$5			$1,411		$1,416
Employee Expenses	AE	5%					$71		$71
Project Support Vendor - PM	AQ						$6,000		$6,000
Project Support Vendor - IP	AQ								
Project Support Vendor - C/P	AQ								
Project Support Vendor - System Planning	AQ								
Project Support Vendor - Enviromental	AQ								
Project Support Vendor - SCS - Notification	AQ			$100			$750		$850
Project Support Vendor - Legal	AQ								
Project Support Vendor - Estimating	AQ								
Project Support Vendor - Siting - Local Zoning	AQ								
Project Support Vendor - Asset Management	AQ								
Project Support Vendor - Other	AQ								
Project Support Vendor - Other	AQ								
Project Support Vendor - Other	AQ								
Project Support Vendor - Other	AQ								
Vehicles (now in indirects section)	AV								
Property or CWIP tax large proj. allowance	BR								
	BR								
Fees and Payments - Enviromental	BF								
Fees and Payments - Siting	BF								
Fees and Payments - Other	BF								
PSMXX Subtotal				$105			$8,232		$8,337
Escalation									
PSMXX Total				$105			$8,232		$8,337
REMXX-TG REMOVAL									
Engineering/Design	LT								
Internal Construction	LT								
LT Total									
Employee Expenses	AE	15%							
Outside Services	AO								
Contractor Labor	AQ						$3,456		$3,456
Vehicles (now in indirects section)	AV								
Rents and Leases	BR								
REMXX Subtotal							$3,456		$3,456
Escalation									
REMXX Total							$3,456		$3,456
TSTXX-TG TEST									
Test / Field Engr. Labor (In House)	LT								
Lead Commissioning Engr. (LCE) (internal)	LT								
Employee Expense	AE	10%							
Test / Field Engr. Labor (contractor)	AQ						$90,000		$90,000
Lead Commissioning Engr. (LCE) (contactor)	AQ						$52,000		$52,000
Vehicles (now in indirects section)	AV								
TSTXX Subtotal							$142,000		$142,000
Escalation									
TSTXX Total							$142,000		$142,000
SUBTOTAL PROJECT DIRECT COST			-	**$46,176**		**$51,527**		**$401,843**		**$499,546**
Risk									
Risk							$72,000		$72,000
					$		$ -		
					$		$ -		
Risk Total							$72,000		$72,000
TOTAL PROJECT DIRECT COST (w risk)			-	**$46,176**		**$51,527**		**$473,843**		**$571,546**
INDIRECTS									
Non-Productive Time Allocation (**ZNP**)	15.1%					$878		$5,510		$6,388
Payroll Benefits Allocation (**ZPB**) incl NPT	44.0%							$17,819		$17,819
Gen SVC CO Overhead (**ZGS**) incl NPT	75.0%					$5,035		$1,218		$6,253
E&S Allocations (**ZEB,ZEL,ZES**)	60.0%					$7,109		$253,403		$260,512
AS&E Allocations (**ZAS**)	1.3%					$807		$8,497		$9,304
Stores Expense Allocation (**ZST**)	8.0%					$3,488				$3,488
Lobby Stock										
M,E/C) (**ZMI**)	6.0%					$3,344		$24,653		$27,997
Vehicles (**ZVE**)	28.0%					$1,634		$10,251		$11,885
Indirects Subtotal						$22,295		$321,351		$343,646
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)				**$46,176**		**$73,822**		**$795,194**		**$915,192**
AFUDC									
AFUDC (ZK)					4.81%	$1,998	4.81%	$22,910	0	$24,908
In Service Dollars										
Cumulative ISS					-		-			
AFUDC Subtotal						$1,998		$22,910		$24,908
TOTAL PROJECT COST - Baseline Budget				**$46,176**		**$75,820**		**$818,104**		**$940,100**
Contingecy									
Contingency								$24,454		$24,454
Other				$ -		$ -		$ -		
Contingency SubTotal								$24,454		$24,454
TOTAL PROJECT COST - Approved Funding				**$46,176**		**$75,820**		**$842,558**		**$964,554**
Reimbursables / Customer Contribution									
Reimbursables / Customer Contribution (enter as negative)				$ -		$ -		$ -		

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Scheduler	Total Float
CS00500 [redacted] DSCADA LTC Controls Upgrade			210	04-Oct-21 08 AM A	04-Aug-22 04 PM			0
CS00500.01 INITIALIZATION AND SCOPE DEVELOPEMENT			71	05-Nov-21 08 AM A	21-Feb-22 08 AM			116
CS00500.01.09 Project Initiation			27	05-Nov-21 08 AM A	15-Dec-21 04 PM			160
CS00500.01.09.3 EPAC Full Funding			27	05-Nov-21 08 AM A	15-Dec-21 04 PM			160
	DE1700	SCLL Review (Project Initiator & PM)	8	05-Nov-21 08 AM A	17-Nov-21 04 PM			179
PAF Submit	PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review	5	08-Nov-21 08 AM A	15-Nov-21 04 PM			0
EPAC-F	FF1000	EPAC Full Funding Approval	5	23-Nov-21 08 AM*	30-Nov-21 04 PM			0
PAF Submit	PAFF2105	EPAC Meeting	1	23-Nov-21 08 AM*	23-Nov-21 04 PM			-1
	PAFF2200	Incorporate EPAC Full Funding PAF Review Comments	5	24-Nov-21 08 AM	01-Dec-21 04 PM			-1
PPA-FF	FF1010	Full Funding PowerPlan Approval	11	01-Dec-21 08 AM*	15-Dec-21 04 PM			9
CS00500.01.12 T-Minus Milestones			72	10-Dec-21 04 PM	21-Feb-22 08 AM			0
CS00500.01.12.1 T-Minus Milestones "A"Electrical			72	10-Dec-21 04 PM	21-Feb-22 08 AM			0
AG-IFC	AT0805E	Elect IFC - Electrical (AG) w/Final BOM	0		10-Dec-21 04 PM			72
	AT0409	ALL FIRM TOA APPLICATIONS DUE TO LCC (for DISTRIBUTION Non-transformer equipment)	0		21-Jan-22 04 PM			30
	AT0401	ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0		07-Feb-22 04 PM			13
	AT1301	COMMISSIONING PLAN COMPLETE	0		14-Feb-22 04 PM			6
	AT0203	CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0		14-Feb-22 04 PM			6
ENG-IFC	A3570	Final Engineering Issued for Construction W/BOM	0		20-Feb-22 04 PM			0
SOC	AT00	A-T-00 - START OF CONSTRUCTION - WO#	0	21-Feb-22 08 AM*				0
CS00500.01.12.2 T-Minus Milestones "B" Civil			72	10-Dec-21 04 PM	21-Feb-22 08 AM			0
BG-IFC	BT0805C	Civil IFC - Civil (BG) w/BOM	0		10-Dec-21 04 PM			72
SOC	BT00	B-T-00 - START OF CONSTRUCTION - WO#	0	21-Feb-22 08 AM*				0
CS00500.05 ENGINEERING & DESIGN			19	15-Nov-21 08 AM A	10-Dec-21 04 PM			117
CS00500.05.01 Civil Engineering			18	16-Nov-21 12 AM A	10-Dec-21 04 PM			37
ES-IFC	DSSE-120	Civil Package IFC	18	16-Nov-21 12 AM A	10-Dec-21 04 PM	[redacted]		37
CS00500.05.02 Electrical Engineering			12	24-Nov-21 08 AM	10-Dec-21 04 PM			37



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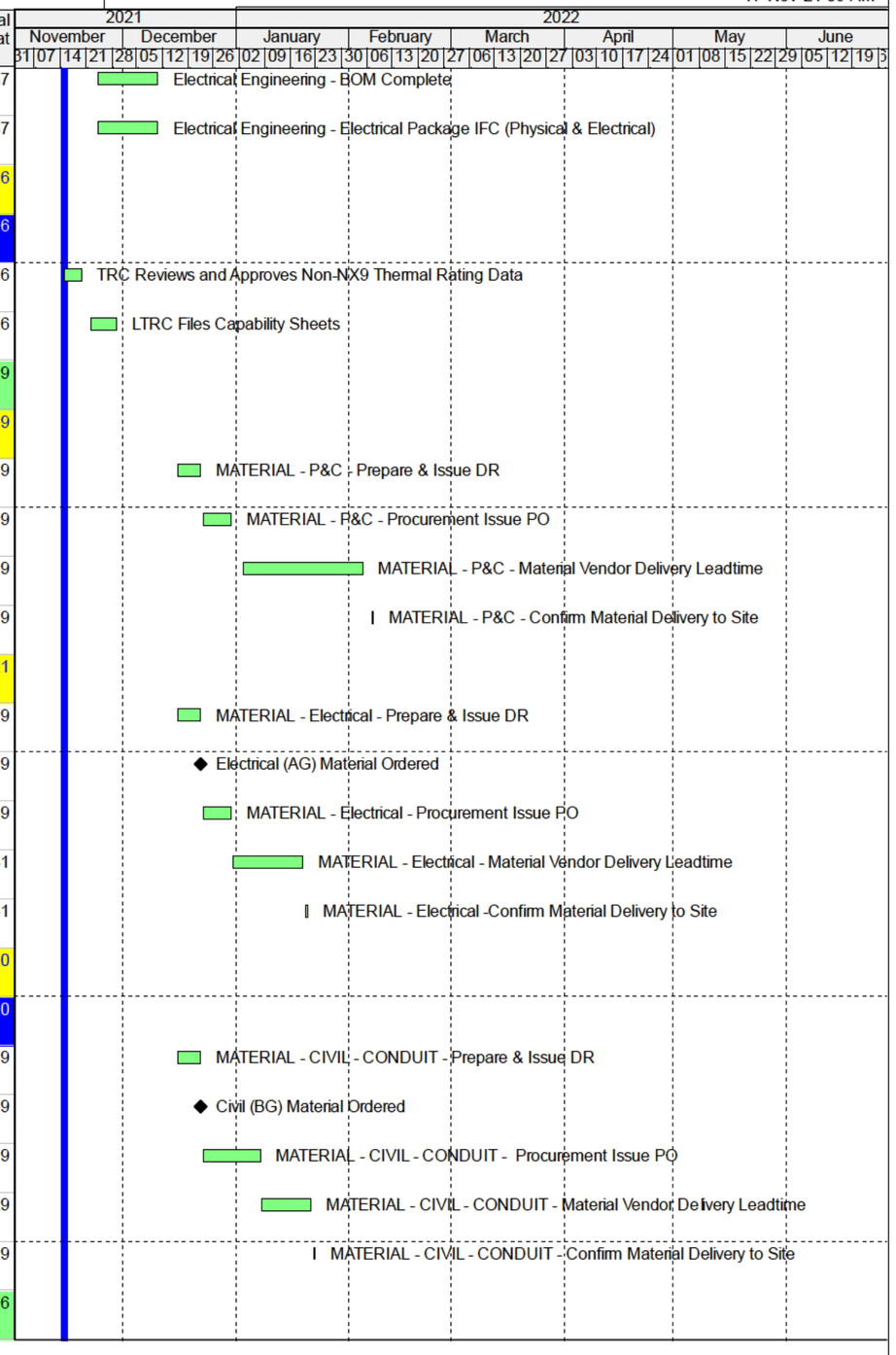
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Scheduler	Total Float
	DSSE-230	Electrical Engineering - BOM Complete	12	24-Nov-21 08 AM	10-Dec-21 04 PM	[redacted]	[redacted]	37
ES-IFC	DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	12	24-Nov-21 08 AM	10-Dec-21 04 PM			37
CS00500.05.03 Distribution Thermal Ratings NX-9			10	15-Nov-21 08 AM	29-Nov-21 04 PM			126
CS00500.05.03.05 Non NX-9 Thermal Ratings			10	15-Nov-21 08 AM	29-Nov-21 04 PM			126
	NX9A-EM64	TRC Reviews and Approves Non-NX9 Thermal Rating Data	5	15-Nov-21 08 AM*	19-Nov-21 04 PM			126
	NX9A-EM74	LTRC Files Capability Sheets	5	22-Nov-21 08 AM	29-Nov-21 04 PM			126
CS00500.06 MATERIAL PROCUREMENT			35	16-Dec-21 08 AM	07-Feb-22 04 PM			9
CS00500.06.01 MATERIAL FOR P&C			35	16-Dec-21 08 AM	07-Feb-22 04 PM			9
DR-RM	DSSE-510	MATERIAL - P&C - Prepare & Issue DR	5	16-Dec-21 08 AM	22-Dec-21 04 PM			9
	DSSE-980	MATERIAL - P&C - Procurement Issue PO	5	23-Dec-21 08 AM	30-Dec-21 04 PM			9
	DSSE-1000	MATERIAL - P&C - Material Vendor Delivery Leadtime	24	03-Jan-22 08 AM	04-Feb-22 04 PM			9
M-DELIV	DSSE-1010	MATERIAL - P&C - Confirm Material Delivery to Site	1	07-Feb-22 08 AM	07-Feb-22 04 PM			9
CS00500.06.02 MATERIAL FOR ELECTRICAL			23	16-Dec-21 08 AM	20-Jan-22 04 PM			21
DR-RM	DSSE-520	MATERIAL - Electrical - Prepare & Issue DR	5	16-Dec-21 08 AM	22-Dec-21 04 PM			19
DR-AGMAT	DSSE-530	Electrical (AG) Material Ordered	0		22-Dec-21 04 PM			19
	DSSE-1020	MATERIAL - Electrical - Procurement Issue PO	5	23-Dec-21 08 AM	30-Dec-21 04 PM			19
	DSSE-1030	MATERIAL - Electrical - Material Vendor Delivery Leadtime	20	31-Dec-21 08 AM	19-Jan-22 04 PM			31
M-DELIV	DSSE-550	MATERIAL - Electrical -Confirm Material Delivery to Site	1	20-Jan-22 08 AM	20-Jan-22 04 PM			31
CS00500.06.03 MATERIAL FOR CIVIL			24	16-Dec-21 08 AM	22-Jan-22 04 PM			20
CS00500.06.03.02 MATERIAL FOR CIVIL - CONDUIT			24	16-Dec-21 08 AM	22-Jan-22 04 PM			20
DR-RM	DSSE-1140	MATERIAL - CIVIL - CONDUIT - Prepare & Issue DR	5	16-Dec-21 08 AM	22-Dec-21 04 PM			19
DR-BGMAT	DSSE-1170	Civil (BG) Material Ordered	0		22-Dec-21 04 PM			19
	DSSE-1150	MATERIAL - CIVIL - CONDUIT - Procurement Issue PO	10	23-Dec-21 08 AM	07-Jan-22 04 PM			19
	DSSE-1160	MATERIAL - CIVIL - CONDUIT - Material Vendor Delivery Leadtime	14	08-Jan-22 08 AM	21-Jan-22 04 PM			29
M-DELIV	DSSE-1130	MATERIAL - CIVIL - CONDUIT - Confirm Material Delivery to Site	1	22-Jan-22 08 AM	22-Jan-22 04 PM			29
CS00500.07 CONSTRUCTION			105	14-Jan-22 08 AM	14-Jun-22 04 PM			6



Remaining Level of Effort | Remaining Work | Mile...
Actual Work | Critical Remaining Work

TASK filter: Not Complete.

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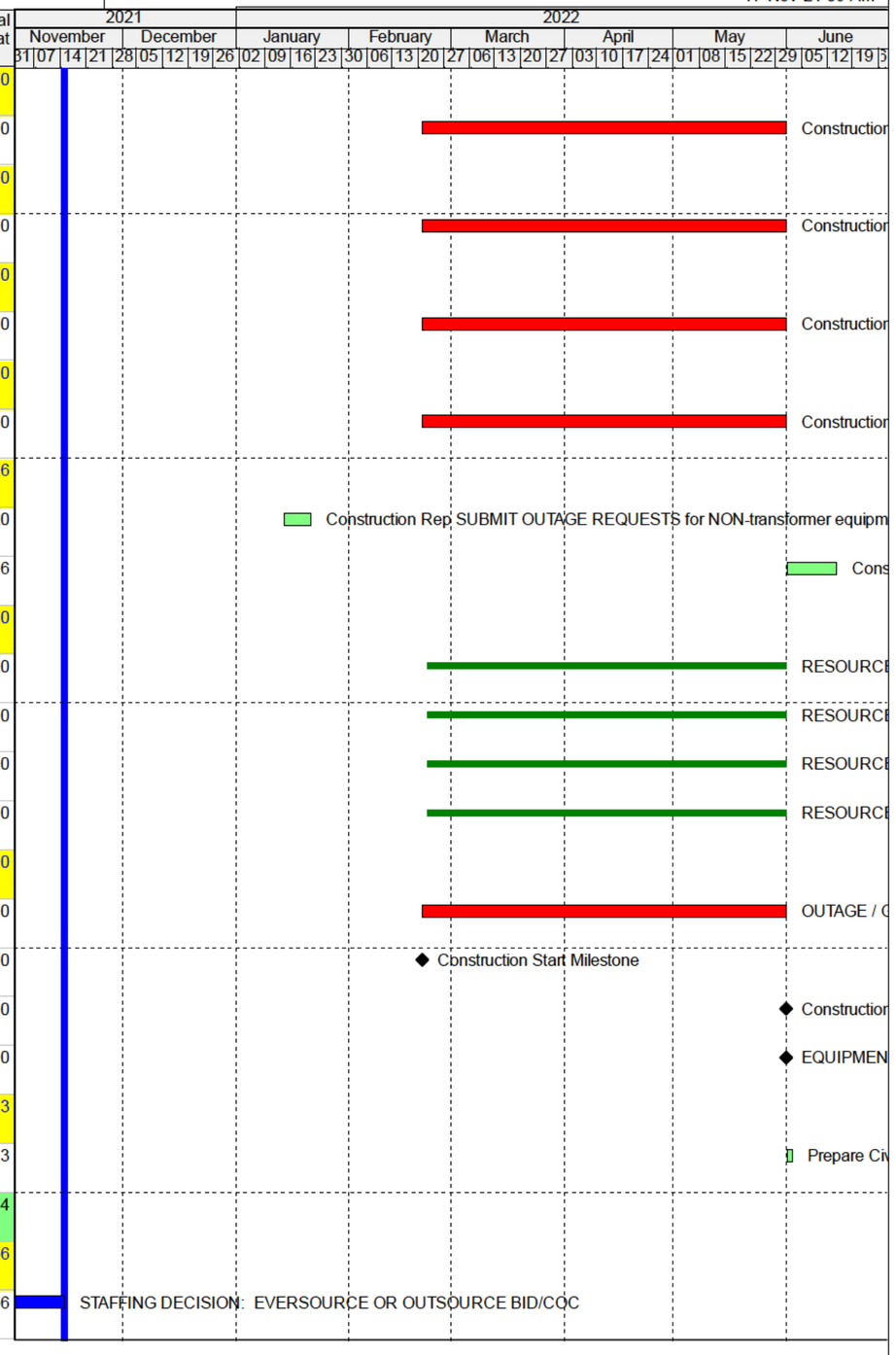
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Scheduler	Total Float
CS00500.07.01 CONSTRUCTION - CIVIL			100	21-Feb-22 08 AM	31-May-22 04 PM			0
	A1120	Construction - Civil	100	21-Feb-22 08 AM*	31-May-22 04 PM	Const Rep Field Sup - Civil		0
CS00500.07.02 CONSTRUCTION - ELECTRICAL			100	21-Feb-22 08 AM	31-May-22 04 PM			0
	A1130	Construction - Electrical	100	21-Feb-22 08 AM*	31-May-22 04 PM	Const Rep Field Sup - S/S		0
CS00500.07.03 CONSTRUCTION - P&C			100	21-Feb-22 08 AM	31-May-22 04 PM			0
	A1140	Construction - P&C Implement Relay Settings	100	21-Feb-22 08 AM*	31-May-22 04 PM	Construction Rep Generic		0
CS00500.07.04 CONSTRUCTION - COMMUNICATIONS			100	21-Feb-22 08 AM	31-May-22 04 PM			0
	A1150	Construction - Communications	100	21-Feb-22 08 AM*	31-May-22 04 PM	Construction Rep Generic		0
CS00500.07.92 CONSTRUCTION - CONST.REP TASKS			105	14-Jan-22 08 AM	14-Jun-22 04 PM			6
	A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage)	5	14-Jan-22 08 AM*	21-Jan-22 04 PM	Construction Rep Generic		20
	A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10	01-Jun-22 08 AM	14-Jun-22 04 PM	Construction Rep Generic		6
CS00500.07.94 CONSTRUCTION RESOURCE TRACKING			70	22-Feb-22 08 AM	31-May-22 04 PM			0
	ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	70	22-Feb-22 08 AM	31-May-22 04 PM	Construction Rep Generic		0
	A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN	70	22-Feb-22 08 AM	31-May-22 04 PM	Distribution Switching Crew		0
	A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT	70	22-Feb-22 08 AM	31-May-22 04 PM	Distribution Switching Crew		0
	CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	70	22-Feb-22 08 AM	31-May-22 04 PM	Distribution - S/S Electrician		0
CS00500.07.96 CONSTRUCTION OUTAGES			100	21-Feb-22 08 AM	31-May-22 04 PM			0
OUT	TOA-Const	OUTAGE / General Construction Work	100	21-Feb-22 08 AM	31-May-22 04 PM	Construction Resources		0
CRH	CSM	Construction Start Milestone	0	21-Feb-22 08 AM*				0
	CFM	Construction Finish Milestone	0		31-May-22 04 PM			0
ISD	ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0		31-May-22 04 PM*			0
CS00500.07.98 CONSTRUCTION CLOSEOUT			2	01-Jun-22 08 AM	02-Jun-22 04 PM			3
	DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	2	01-Jun-22 08 AM	02-Jun-22 04 PM	Construction Resources		3
CS00500.09 TEST AND COMMISSION			120	04-Oct-21 08 AM A	29-Mar-22 04 PM			44
CS00500.09.01 TEST - SERVICES STAFFING DECISION			38	04-Oct-21 08 AM A	29-Nov-21 04 PM			56
	A1010	STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/COC	28	04-Oct-21 08 AM A	15-Nov-21 08 AM			56



Remaining Level of Effort | Remaining Work | Mile...
Actual Work | Critical Remaining Work

TASK filter: Not Complete.

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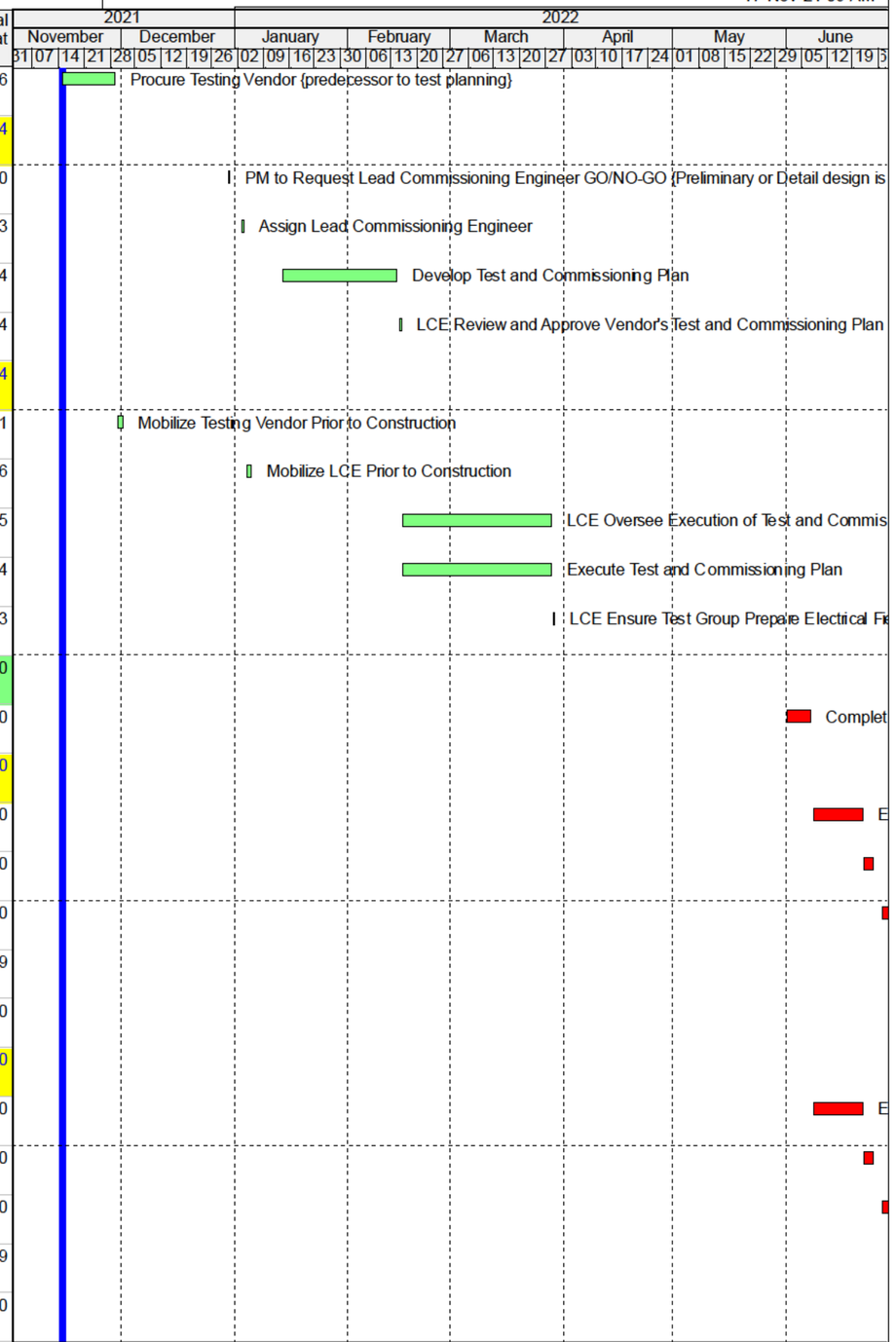
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Scheduler	Total Float
	A3250	Procure Testing Vendor {predecessor to test planning}	10	15-Nov-21 08 AM	29-Nov-21 04 PM	[redacted]	[redacted]	56
CS00500.09.02 LCE PLANNING			32	30-Dec-21 08 AM	15-Feb-22 04 PM			44
	LCE100	PM to Request Lead Commissioning Engineer GO/NO-GO {Preliminary or Detail design is often the predecessor}	1	30-Dec-21 08 AM	30-Dec-21 04 PM*			0
	LCE200	Assign Lead Commissioning Engineer	1	03-Jan-22 08 AM	03-Jan-22 04 PM			33
	LCE400	Develop Test and Commissioning Plan	21	14-Jan-22 08 AM*	14-Feb-22 04 PM			4
	LCE500	LCE Review and Approve Vendor's Test and Commissioning Plan	1	15-Feb-22 08 AM*	15-Feb-22 04 PM			44
CS00500.09.04 TEST ACTIVITIES			82	30-Nov-21 08 AM	29-Mar-22 04 PM			44
	LCE320	Mobilize Testing Vendor Prior to Construction	2	30-Nov-21 08 AM*	01-Dec-21 04 PM			81
	LCE310	Mobilize LCE Prior to Construction	2	04-Jan-22 08 AM	05-Jan-22 04 PM			46
	LCE610	LCE Oversee Execution of Test and Commissioning Plan	28	16-Feb-22 08 AM	28-Mar-22 04 PM			45
	LCE620	Execute Test and Commissioning Plan	28	16-Feb-22 08 AM*	28-Mar-22 04 PM			44
	LCE700	LCE Ensure Test Group Prepare Electrical Field Mark Ups	1	29-Mar-22 08 AM	29-Mar-22 04 PM			63
CS00500.10 PROJECT CLOSE OUT			46	01-Jun-22 08 AM	04-Aug-22 04 PM			0
	DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5	01-Jun-22 08 AM	07-Jun-22 04 PM			0
CS00500.10.01 Civil As-Builts			41	08-Jun-22 08 AM	04-Aug-22 04 PM			0
	DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	10	08-Jun-22 08 AM	21-Jun-22 04 PM			0
	DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	3	22-Jun-22 08 AM	24-Jun-22 04 PM			0
ES-ASB	DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	8	27-Jun-22 08 AM	07-Jul-22 04 PM			0
	DSSE-880	PM to Document Civil As-Built Drawings Complete	1	08-Jul-22 08 AM	08-Jul-22 04 PM			19
	DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	20	08-Jul-22 08 AM	04-Aug-22 04 PM			0
CS00500.10.02 Electrical As-Builts			41	08-Jun-22 08 AM	04-Aug-22 04 PM			0
	DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	10	08-Jun-22 08 AM	21-Jun-22 04 PM			0
	DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	3	22-Jun-22 08 AM	24-Jun-22 04 PM			0
ES-ASB	DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	8	27-Jun-22 08 AM	07-Jul-22 04 PM			0
	DSSE-840	PM to Document Electrical As-Built Drawings Complete	1	08-Jul-22 08 AM	08-Jul-22 04 PM			19
	DSSE-1110	Complete TD-176 Electrical Design Prep & Issue As-Built Dwgs	20	08-Jul-22 08 AM	04-Aug-22 04 PM			0



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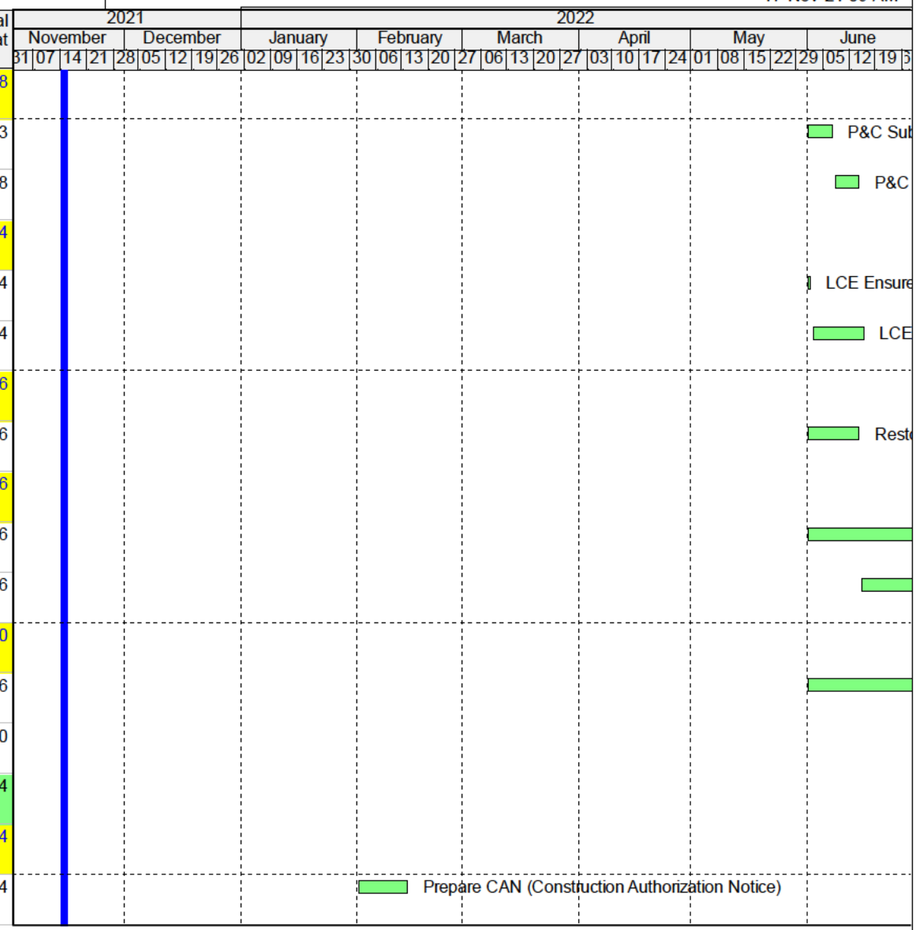
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Scheduler	Total Float
CS00500.10.03 P&C As-Builts			10	01-Jun-22 08 AM	14-Jun-22 04 PM			8
	DSSE-960	P&C Submits Relay Setting As-Builts	5	01-Jun-22 08 AM	07-Jun-22 04 PM	CT- P&C Engineer Generic		13
	DSSE-950	P&C Submits SDS As-Builts	5	08-Jun-22 08 AM	14-Jun-22 04 PM	CT- P&C Engineer Generic		8
CS00500.10.04 Test Closout			11	01-Jun-22 08 AM	15-Jun-22 04 PM			34
	LCE800	LCE Ensures Marked up Prints Ready for Pick-up	1	01-Jun-22 08 AM	01-Jun-22 04 PM	CT - Lead Commissioning Engineer		34
	LCE900	LCE Review Test Data and Issue Commissioning Report	10	02-Jun-22 08 AM	15-Jun-22 04 PM	CT - Lead Commissioning Engineer		34
CS00500.10.05 SITE RESTORATION CLOSEOUT			10	01-Jun-22 08 AM	14-Jun-22 04 PM			36
	A1110	Restore / Remediate Site	10	01-Jun-22 08 AM	14-Jun-22 04 PM	CT/WMA.Constru Contractor-GENE		36
CS00500.10.06 MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT			40	01-Jun-22 08 AM	27-Jul-22 04 PM			6
	A1020	Cost Analyst Prepares FINAL Units of Property	30	01-Jun-22 08 AM	13-Jul-22 04 PM	CT- Cost Analyst Generic		16
	A1030	Asset Management Complete Asset Update(s) in CASCADE	30	15-Jun-22 08 AM	27-Jul-22 04 PM			6
CS00500.10.07 PROJECT MANAGEMENT CLOSEOUT			46	01-Jun-22 08 AM	04-Aug-22 04 PM			0
	A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30	01-Jun-22 08 AM	13-Jul-22 04 PM			16
	FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0		04-Aug-22 04 PM			0
CS00500.13 OVERHEAD / INDIRECTS			10	01-Feb-22 08 AM	14-Feb-22 04 PM			4
CS00500.13.01 PROJECT MANAGEMENT			10	01-Feb-22 08 AM	14-Feb-22 04 PM			4
	A1170	Prepare CAN (Construction Authorization Notice)	10	01-Feb-22 08 AM*	14-Feb-22 04 PM			4



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Constructability Review Form: **Substation**

Project Title: [redacted] Dscada LTC	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS009047/CS00430	**Project Constructability Phase:**	
Date(s) of Constructability Review: **07/29/2021**	☐ Conceptual Engineering Design	
Click to enter a date	☒ Preliminary Engineering Design	
	☐ Detailed Engineering Design	
Project Scope Statement: Install DSCADA equipment for the -1Q-1X and 1Q-2X		

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	
☐	☒	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:

[redacted] *7/29/21*_____*Name / Signature*

Date

EVERSOURCE

Constructability Review Form: **Substation**

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

Action Items and Resolutions:

Item No.	Const. Review Action Item/Concern	Design Resolution/Mitigation:
1	Engineering determine cable route to control house	Engineering to issue conduit drawings on 12/10/21
2	Controls need to be replaced	Engineering to re-issue drawings on 12/10/21
3		
4		
5		

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

EVERSOURCE

Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
2	**Materials Identified/Ordered** -Any concerns with BOM/Major Materials? Review BOM lead times and project need dates -Specialty Major Materials: Identify Specialty Equipment & Materials potentials - temporary/replacement - long lead items? -Any Materials needed to facilitate construction access?		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	
5	**Wall, Fence, Gate, and Foundation Considerations** -Any permanent / temporary alterations or relocations required? -Pre-Project Sound Measurements Needed? Sound Walls? -Take measurements for Foundation quantities, dimensions and concrete volumes -CIP Review/Ballistic needs. Any Physical Security Requirement Consideration? -Assess condition of existing yard equipment foundations and viability for reuse (if proposed) -Review station expansion areas (if needed) for structures, old foundations, etc. -Any Steel Structural Plan Considerations? -Any impacts to construction plan?	☐	N/A
6	**Below Grade / Enclosure Raceway** - If possible, evaluate existing raceway and review spacing requirements. Review for any subsurface investigation needs or potential below grade obstructions. GPR/test pits needed? Geotechnical Investigation - is soil boring or resistivity investigation needed?	N/A	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
7	**Underground Obstructions** -Drawing review concerns? -Is preconstruction or test excavation needed? -Is reuse of underground control cables / Conduits /replace Non-Shielded Cable feasible (if applicable) -Are spare conduits available? Are they useable? -Review if any areas will need to be plated for increased load bearing for equipment access (i.e. large Xfmr, etc.)		Cable route shown on issued drawings not buildable. Need new conduit route from engineering
8	**Grounding Plan (Ground Grid)** - Will footprint impact layout or other equipment? Identify locations to improve grounding. Impacts to foundations and ground grid plans. Observations on wetlands or ability to perform tests	☐	N/A
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	☐	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	☐	N/A

EVERSOURCE

Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
	-Specialty Contractors Required? -Required Oversite Needed - Estimated level of CR and LCE support needed		
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

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

[redacted]

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 Distribution Supervisory Control and Data Acquisition (DSCADA) Load Tap Changer (LTC) Automation at all remaining Eversource CT sites currently utilizing the [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]

There are 121 transformers in 57 stations identified by engineering for Distribution Substations remaining to be completed under the original CS00090 Program. Of these, 99 transformers in 46 stations will be completed 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 nine transformers, Lakeview 31A CS00433, Waterside 22M CS00432 and Cedar Heights 4R CS00430. Additionally, 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

[redacted] can be found in Attachment 2.

Project Objectives

[redacted]

Project Scope

[redacted]

The work at each proposed station requires further evaluation to finalize scope, project details, and cost estimates. The $250K will be used for Substation Engineering, P&C Engineering, Asset Management, Estimating, Project Management, and Field Engineering at a cost on average of $50K per station. Individual release PAF's for each substation will be written and proposed for EPAC review and approval.

- 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)**
   This is not an acceptable alternative. Eversource CT is required by ISO to have the [redacted]

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]	[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]

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. 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:

Project Scope:

[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. 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

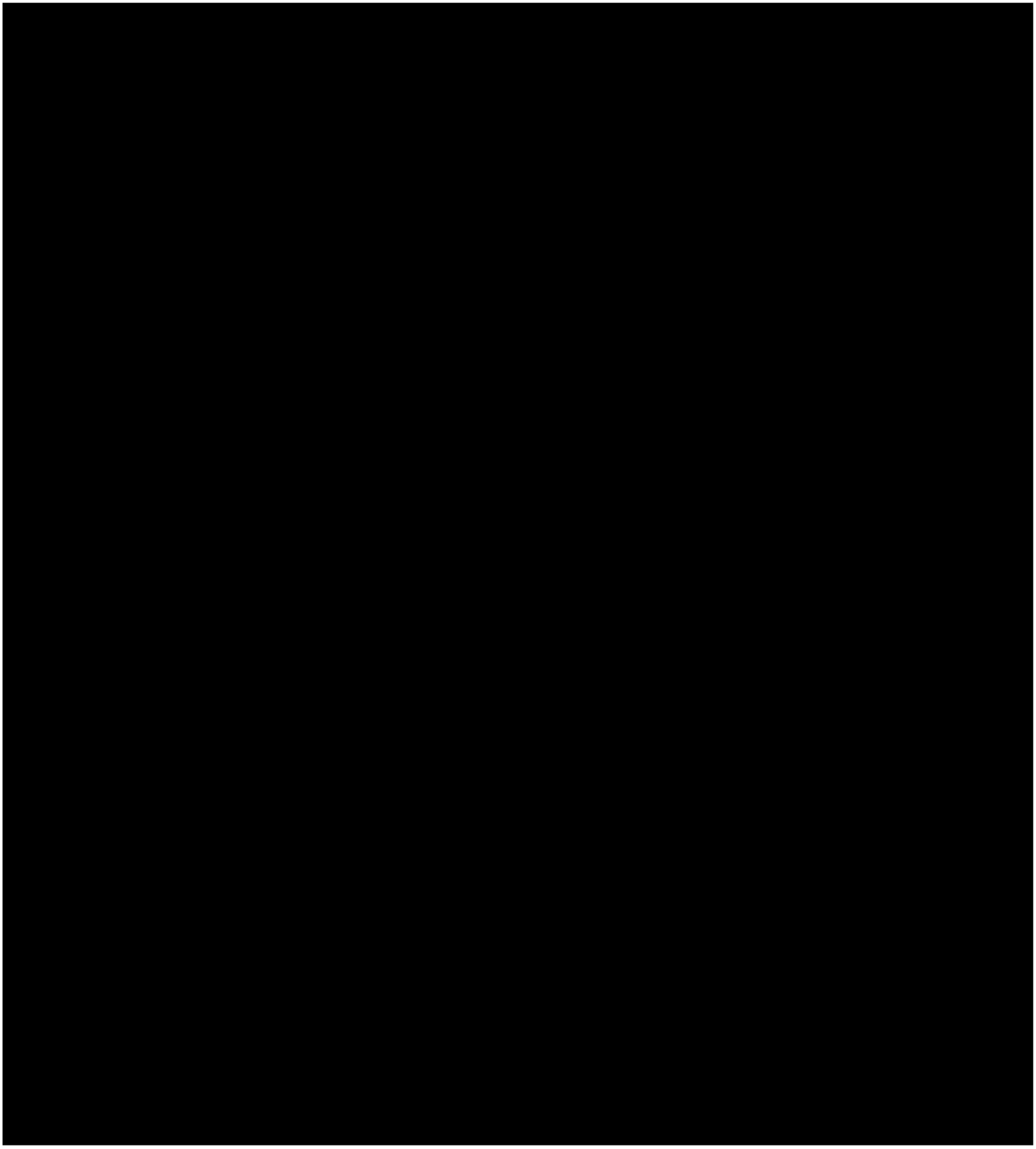
Check AFUDC rate minor drop in CT D rate.

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

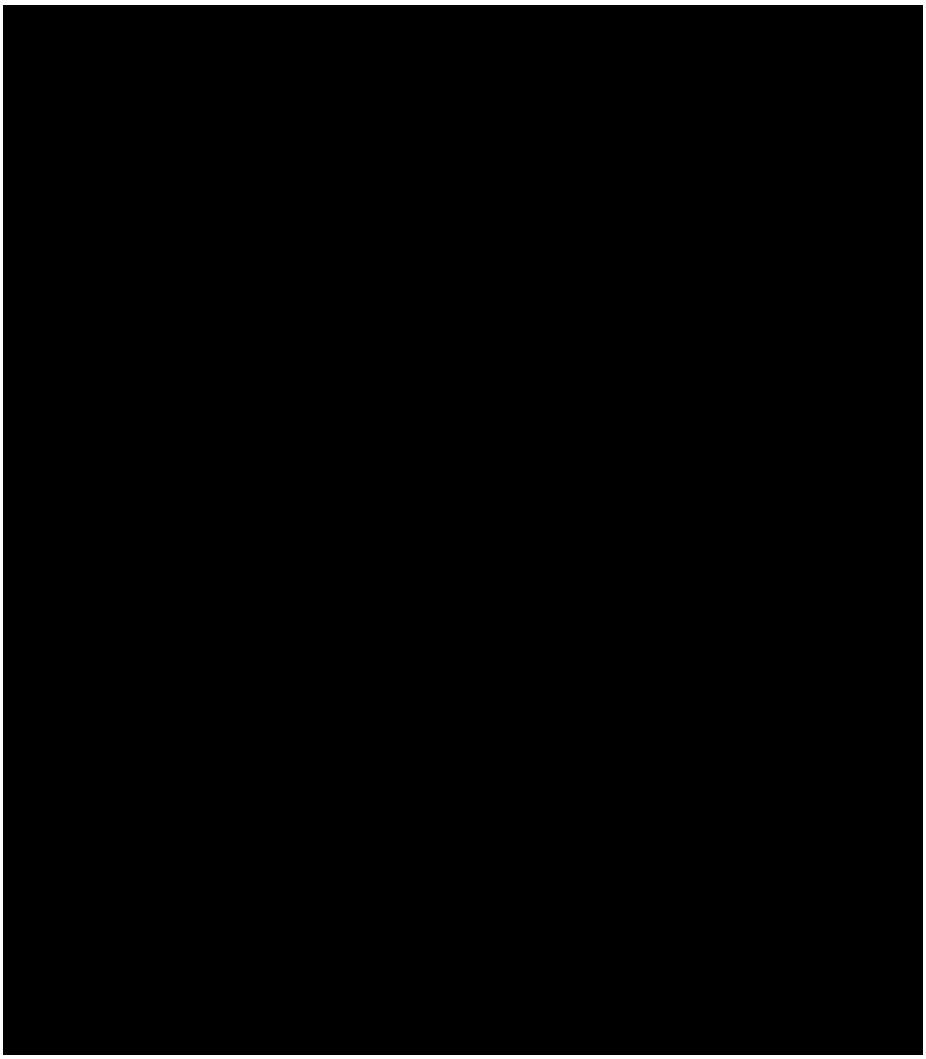


ATTACHMENT 3 - Photos

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:

