EVERSOURCE

Program Release Form

Approved on December 22, 2021 EPAC

Link to Meeting Minutes

Date Prepared: 12/12/2021	**Project Title: DSCADA LTC Controls Upgrade** [redacted]
Company: Eversource CT	**Facility Name:** [redacted]
Organization: Asset Management	**Project Number: CS00529**
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: $744K	**Estimated in service date(s): 11/22/2022**
	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 Project Authorization Form (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 $744K [redacted]

The Program Level PAF CS00407 had $250K of initial funding approved in PowerPlan on May 25, 2021. As of December 01, 2021, approximately $23K has been charged to WO CS009083, under the previously established program CS00090 as noted in the Program Level PAF, for

preliminary engineering and design at [redacted] substation. These prior charges will be journaled to this new release upon approval.

Project Scope

[redacted]

Scope of Work

[redacted]

Major Material

1. Two (2) LTC DSCADA Cabinet Remote Terminal Units (RTUs), one for each transformer.
2. Two (2) LTC tap position monitors, one for each transformer.

A constructability review was performed on October 29, 2021 (See Attachment C). It was determined that there is adequate space to install the DSCADA equipment.

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	$4	$1	($3)
4. Siting Approvals / Permits	$	$	$
5. Engineering / Design	$21	$29	$8
6. Materials (Eversource purchased)	$37	$19	($18)
7. Construction (incl matl's by contractors)	$140	$159	$19
8. Testing / Commissioning	$123	$140	$17
9. Project Mgmt Team	$21	$12	($9)
10. Removals	$5	$6	$1
11. Other	$	$	$
12. Risks	$126	$56	($70)
SUBTOTAL DIRECTS W/ RISKS	**$477**	**$421**	**($56)**
13. Indirects/Overhead	$234	$288	$54
14. AFUDC	$19	$19	$
PROJECT TOTAL – BASELINE BUDGET	**$730**	**$728**	**($2)**
15. Contingency	$	$16	$16
TOTAL CAPITAL REQUEST	**$730**	**$744**	**$16**
16. Reimbursables/Customer Contribution	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$730**	**$744**	**$16**
O&M	$	$	$
Total Request	**$730**	**$744**	**$16**

*CT Program unit cost unitized using Option #1 - $365K for one transformer, LTC control upgrade only, using existing controls & conduit (least cost). Calculated for two (2) 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: ($3K) –** Unit price per transformer reflects outreach required at one station. A savings is realized as any required outreach for two transformers can be accomplished simultaneously.
4. **Siting Approvals / Permits: $0 –** No changes from the Program Level PAF.
5. **Engineering / Design: $8K** - Engineering accounts for previous costs under WO CS009083 and remaining costs estimated to complete engineering to IFC.
6. **Materials (by Eversource): ($18K) –** Savings realized for Eversource purchased materials by allocating purchased materials to the construction line item.
7. **Construction (including materials supplied by contractors): $19K** –Increase based on contractor quotes and inclusion of necessary materials.
8. **Testing / Commissioning: $17K –**Increased costs based on contractor quotes.
9. **Project Management Team: ($9K)** - Savings in economies of scale.
10. **Removals: $1K –** No major change from the Program Level PAF.
11. **Other: $0 –** No changes from the Program Level PAF
12. **Risks: ($70) –** Reductions due to site specific conditions.
13. **Indirects/Overhead: $54K –** Indirects are proportional to direct costs and rates used at the time of the estimate.
14. **AFUDC:** $0 – No changes from Program Level PAF
15. **Contingency: $16K –** Contingency was not included in the Program Level unitized cost but is included to account for project unknowns and is site specific.
16. **Reimbursables/Customer Contribution: $0 –** No changes from the Program Level PAF.

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

EVERSOURCE

Project Costs Summary for two (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		$9	$15	$6	$29
6. Materials (Eversource purchased)			$17	$2	$19
7. Construction (incl matl's by contractors)				$159	$159
8. Testing / Commissioning				$140	$140
9. Project Mgmt Team		$3	$6	$2	$12
10. Removals				$6	$6
11. Other					$
12. Risks			$15	$41	$56
SUBTOTAL DIRECTS W/ RISKS	**$250**	**$12**	**$53**	**$356**	**$421**
13. Indirects/Overhead		$10	$44	$234	$288
14. AFUDC		$1	$2	$16	$19
PROJECT TOTAL – BASELINE BUDGET	**$250**	**$23**	**$98**	**$607**	**$728**
15. Contingency				$16	$16
TOTAL CAPITAL REQUEST	**$250**	**$23**	**$98**	**$623**	**$744**
16. Reimbursables/Customer Contribution					$
PROJECT TOTAL (LESS REIMBURSABLES)	**$250**	**$23**	**$98**	**$623**	**$744**
O&M					
TOTAL REQUEST	**$250**	**$23**	**$98**	**$623**	**$744**

Risk total of $56K included for: potential underground obstructions $10K, severe weather delays & OT $16K, potential controller compatibility issues (due to reutilization of existing Beckwith Controllers) $10K 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		$12	$14	$11	$37
OT Labor					
Outside Services Labor			$6	$296	$302
Materials*			$17	$2	$19
Removals				$6	$6
Other			$16	$58	$74
Indirects		$10	$44	$234	$288
AFUDC		$1	$2	$16	$19
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$250**	**$23**	**$98**	**$623**	**$744**

*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:
Only Capital expenditure for 2021. No O&M, nor Other.

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):

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 - No changes from the Program Level PAF.

Risks and Risk Mitigation Plans

[redacted]

Contingency

$16K contingency is included for project unknowns.

Project Schedule

Milestone/Phase Name	Estimated Dates
Program Level Initial Funding Approval (CS00407)	March 2021
EPAC Meeting – Release Presentation	December 22, 2021
Engineering IFC	March 29, 2022
Material Received	April 17, 2022
Construction Start	September 30, 2022
Construction Completion	November 23, 2022
ISD	November 23, 2022

See Attachment B for the P6 schedule.

Attachments

- Attachment A - [redacted] DSCADA LTC Upgrade Estimate - CS00529 Rev2 MJH
- Attachment B – [redacted] CS00529 DSCADA LTC P6 Schedule Rev 1
- Attachment C - Substation Constructability Review Form CS00529 [redacted]
- Attachment D – [redacted] Nomenclature
- Attachment E - Program Level PAF - DSCADA Load Tap Changer (LTC) Receivers Upgrades CS00407

EVERSOURCE

Project Checklist - Transmission & Substation Capital Project	
Project Name: DSCADA LTC Controls Upgrade [redacted]	**Project Number: CS00529**

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?	Yes		
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: DSCADA LTC Controls Upgrade [redacted]	**Project Number: CS00529**

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?	Low
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/Lead [redacted]

Project Number: CS00529
WO & Task #: TBD
Estimate revision #: 00
Estimate Type - Station work

Estimate #: C- xxx-xx
Date of Estimate:11/19/2021

Estimate done by [redacted]
In Service date (ISD):11/22/2022

Template Revision # 01.05d

Alt Estimate Summary for PP4 Calc (escalation separate)

Estimate #: C- xxx-xx
Date of Estimate:11/19/2021

Project Number: CS00529
WO & Task #: TBD

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	$700	0 2%	0.1%		$100	$600								
4	Siting Approvals / Permits														
5	Engineering / Design	$29,200	6 9%	3.9%	$9,000	$14,700	$5,500								
6	Materials (Eversource purchased)	$18,500	4.4%	2.5%		$17,000	$1,500								
7	Construction (incl matl's by contractors)	$158 800	37.7%	21.3%	$100		$158 700								
8	Testing / Commissioning	$140,400	33 3%	18.9%			$140,400								
9	PMT Project Mgmt Team	$11,600	2 8%	1.6%	$3,300	$6,000	$2,300								
10	Removals	$5,900	1.4%	0.8%			$5,900								
11	Other														
12	Risks	$56,000	13 3%	7.5%		$15 000	$41 000								
125															
	Project Directs Total w/Risks	**$421,100**	100 0%	56.6%	**$12,400**	**$52,800**	**$355,900**								
13	Indirects/Overhead	$287,800		38.7%	$9,800	$43,900	$234,100								
14	AFUDC	$18,900		2.5%	$800	$1,700	$16,400								
155															
	Project Total - Baseline Budget	**$727,800**		97.8%	**$23,000**	**$98,400**	**$606,400**								
15	Contingency	$16,300		2.2%			$16,300								
	Project Total - Funding Approval Level	**$744,100**		100.0%	**$23,000**	**$98,400**	**$622,700**								
16	Reimbursables/Customer Contribution														
166															
	Project Total (less reimbursables)	**$744,100**			**$23,000**	**$98,400**	**$622,700**								
	Cost per key qty (if appl)	$72,050	$'s / EA												
	Amount of Escalation included above	$13,800					$13,800								
6	Total materials - Eversource	$18,500				$17,000	$1,500								
	Total materials - Contractor														
	Total materials	$18 500				$17 000	$1 500								

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

Estimate Range	**-25%**		**25%**
	$558,000		**$930,000**

WBS	Description	TOTAL w/ escal broken out
1	ROW / Easements / Land purchas	$ -
2	Environmental Approvals / Permits	$ -
3	Outreach	$ 700
4	Siting Approvals / Permits	$ 100
5	Engineering / Design	$ 29,000
6	Materials (Eversource purchased)	$ 18,500
7	Construction (incl matl's by contr	$ 156,300
8	Testing / Commissioning	$ 136,300
9	PMT Project Mgmt Team	$ 11,600
10	Removals	$ 5,800
11	Other	$ -
12	Risks	$ 56 000
		$414,300
13	Indirects/Overhead	$ 281,100
14	AFUDC	$ 18,900
		$ -
		$714,300
15	Contingency	$ 16,300
		$ -
		$ -
		$730,600
		$ -
		$ -
		$730,600
6		$ 13,800
	Escal total	**$744,400**
	Check total	$300

COMMENTS:

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

[redacted]

Major Material
- Two (02) CABINETS, ENCLOSURE, LTC DSCADA, AL, 24 IN X 18 IN X 14 IN .
- Two (02) MONITORS, LTC TAP POS, PROGRAMMABLE, 120VAC, 4 TO 20 MA ANALOG OUTPUT, RS-232.

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.Estimate assumes existing communication are in good working condition.
6.Drawings have been issued and all material have been ordered
7.The transformer alarms will be modified and taken back to the SEL-224O Axion.
* On the 18P-1X re-use existing M-2001C control (with Comm port) with existing M-2067B Adapter Panel.
* On the 18P-2X re-use existing M-2001C control (with Comm port) with existing M-2067B Adapter Panel.

RISKS

Potential UG Obstructions	$ 10.000
Severe Weather. Delays. OT	$ 16.000
Design development	$ 20.000
Controller Compatibility Issues	$ 10.000

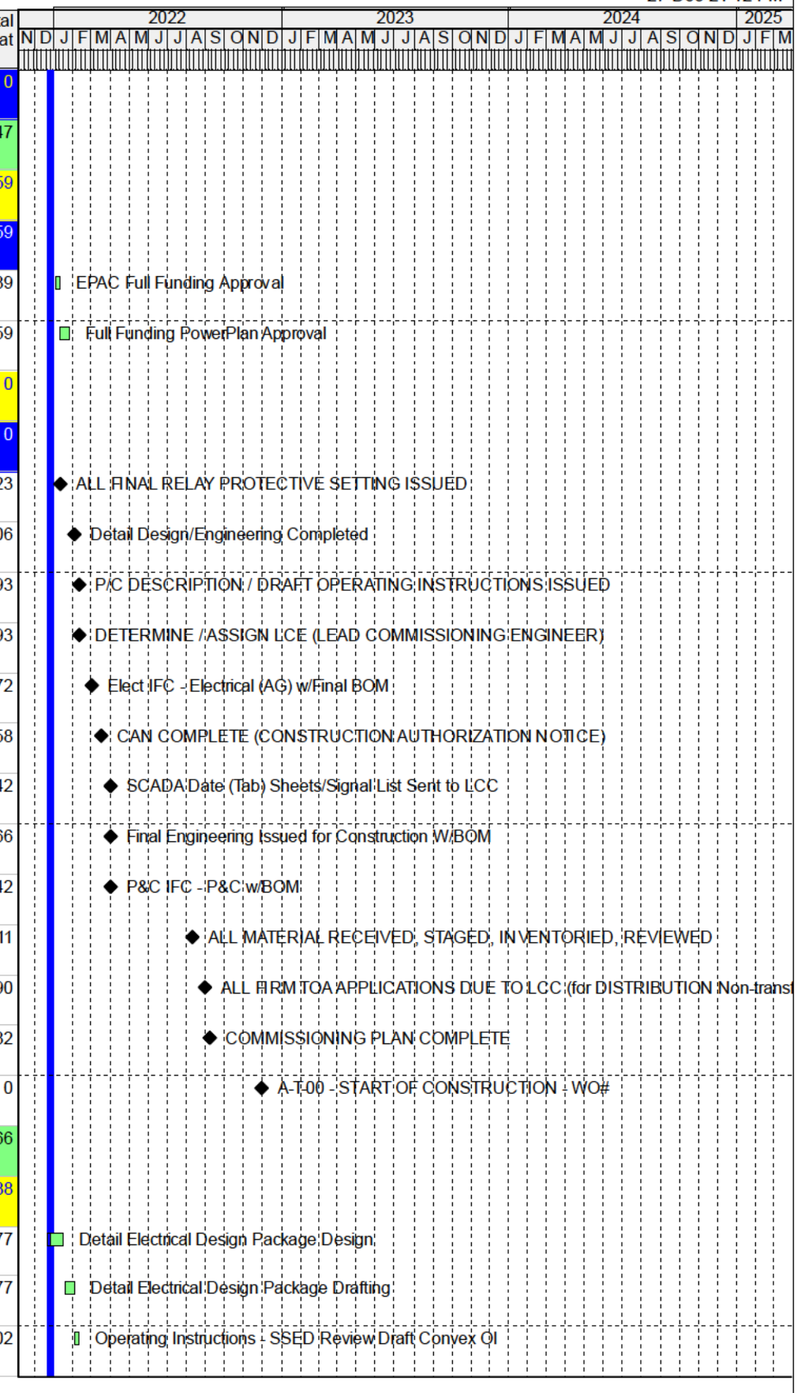
UNESCALATED LINE ITEM DOLLARS

Proiect Number CS00529
Date of Estimate 11/19/2021
Estimate revision # 00

Escalation Rate — E Rate $ 53 — 21 — 1

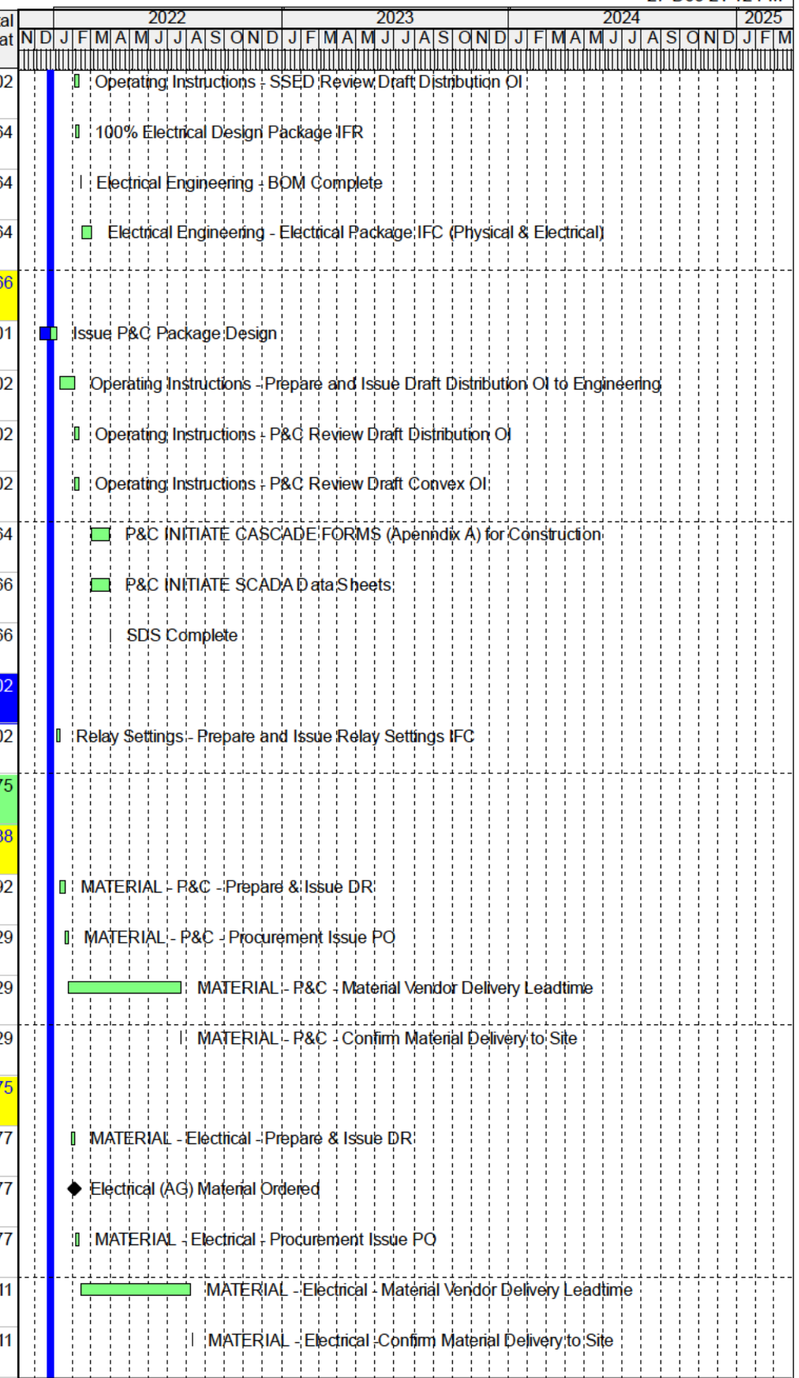
			Prior Mhrs	Prior DOLLARS	21 DOLLARS	22 DOLLARS	TOTAL DOLLARS
CSTXX-CONSTRUCTION	R						
Electrical Construction	LT						
General Construction	LT						
SCADA / Automation	LT					$1,272	$1,272
Telecom - Field	LT						
Construction Reps (internal)	LT					$848	$848
Support Switch/Tag	LT					$1,272	$1,272
Other (specify)	LT						
Other (specify)	LT						
Other (specify)	LT						
LT Total						$3,392	$3,392
Employee Expenses	AE	5%		$84		$170	$254
Construction Purchased Material	AM	1%				$1,504	$1,504
Outside Construction Vendor	AQ					$150,376	$150,376
Sales tax on Constr. Vendor							
Vehicles (now in indirects section)	AV						
Inspection services (Outside Vendor)	AQ						
Construction Rep (Outside vendor)	AQ					$2,304	$2,304
Rents and Leases	BR						
CSTXX Subtotal				$84		$157,746	$157,830
Escalation							
CSTXX Total				$84		$157,746	$157,830
ENRXX-TG ENGINEERING/DESIGN							
Project Services/Drafting	LT				$3,392	$848	$4,240
T- Line Engineering/Design	LT						
D- Street Engineering/Design	LT						
Civil Engineering/Design	LT				$848	$848	$1,696
Substation (T) Engineering/Design	LT						
Substation (D) Engineering/Design	LT				$3,392	$848	$4,240
Protection & Controls Engineering	LT				$2,544	$848	$3,392
Survey Engineering	LT						
SCADA / Automation Engineering	LT						
Telecom Engineering	LT				$1,908	$848	$2,756
Other - PP Actuals	LT			$8,971			**$8,971**
Other - Project Engineer	LT				$1,908	$848	$2,756
LT Total				$8,971	$13,992	$5,088	$28,051
Employee Expenses	AE	5%			$700	$254	$954
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				$8,971	$14,692	$5,342	$29,005
Escalation							
ENRXX Total				$8,971	$14,692	$5,342	$29,005
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				$16,400		$16,400
Outside Services	AM						
	AM						
Freight							
Sales Tax Eversouce/outside services	3.9%	3.9%			$600		$600
Other							
MATXX Subtotal					$17,000		$17,000
Escalation							
MATXX Total					$17,000		$17,000
PSMXX-PROJECT MANAGER & SUPPORT							
Project Management (PM)	LT						
Project Planning/Cost (IP)	LT						
Contracts/Purchasing (CP)	LT						
System Planning	LT						
Environmental	LT						
SCS - Notification	LT				$3	$31	$34
Legal	LT						
Estimating	LT					$2,120	$2,120
Siting - Local Zoning	LT					$100	$100
Asset Management	LT						
Other - Actual PP Charges	LT			$3,323			$3,323
Other -	LT						
Other -	LT						
Other -	LT						
LT Total				$3,323	$3	$2,251	$5,577
Employee Expenses	AE	5%				$113	$113
Project Support Vendor - PM	AQ				$6,000		$6,000
Project Support Vendor - IP	AQ						
Project Support Vendor - CP	AQ						
Project Support Vendor - System Planning	AQ						
Project Support Vendor - Enviromental	AQ						
Project Support Vendor - SCS - Notification	AQ				$60	$580	$640
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 targe proj. allowance	BR						
	BR						
Fees and Payments - Enviromental	BF						
Fees and Payments - Siting	BF						
Fees and Payments - Other	BF						
PSMXX Subtotal				$3,323	$6,063	$2,944	$12,330
Escalation							
PSMXX Total				$3,323	$6,063	$2,944	$12,330
REMXX-TG REMOVAL							
Engineering/Design	LT						
Internal Construction	LT						
LT Total							
Employee Expenses	AE	15%					
Outside Services	AQ						
Contractor Labor	AQ					$5,760	$5,760
Vehicles (now in indirects section)	AV						
Rents and Leases	BR						
REMXX Subtotal						$5,760	$5,760
Escalation							
REMXX Total						$5,760	$5,760
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					$86,400	$86,400
Lead Commissioning Engr. (LCE) (contactor)	AQ					$49,920	$49,920
Vehicles (now in indirects section)	AV						
TSTXX Subtotal						$136,320	$136,320
Escalation							
TSTXX Total						$136,320	$136,320
SUBTOTAL PROJECT DIRECT COST			-	**$12,378**	**$37,755**	**$308,112**	**$358,246**
Risk							
Risk					$15,000	$41,000	$56,000
					$ -	$ -	
					$ -	$ -	
Risk Total					$15,000	$41,000	$56,000
TOTAL PROJECT DIRECT COST (w risk)			-	**$12,378**	**$52,755**	**$349,112**	**$414,246**
INDIRECTS							
Non-Productive Time Allocation (**ZNP**)	15.1%			$513	$2,106	$1,615	$4,234
Payroll Benefits Allocation (**ZPB**) Incl NPT	44.0%					$1,717	$1,717
Gen SVC CO Overhead (**ZGS**) incl NPT	75.0%			$2,696	$12,076	$6,333	$21,105
E&S Allocations (**ZEB,ZEL,ZES**)	60.0%			$5,719	$20,542	$189,442	$215,703
AS&E Allocations (**ZAS**)	1.3%			$319	$906	$6,340	$7,565
Stores Expense Allocation (**ZST**)	8.0%				$1,312		$1,312
Lobby Stock							
MDEC (**ZMI**)	6.0%			$554	$3,080	$18,828	$22,462
Vehicles (**ZVE**)	28.0%			$39	$3,919	$3,005	$6,963
Indirects Subtotal				$9,840	$43,941	$227,280	$281,061
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)				**$22,218**	**$96,696**	**$576,392**	**$695,306**
AFUDC							
AFUDC (ZK)				$788	$1,716	$16,419	$18,923
In Service Dollars							
Cumulative ISS					-	-	
AFUDC Subtotal				$788	$1,716	$16,419	$18,923
TOTAL PROJECT COST - Baseline Budget				**$23,005**	**$98,412**	**$592,811**	**$714,228**
Contingecy							
Contingency						$16,335	$16,335
Other				$ -	$ -	$ -	
Contingency SubTotal						$16,335	$16,335
TOTAL PROJECT COST - Approved Funding				**$23,005**	**$98,412**	**$609,146**	**$730,563**
Reimbursables / Customer Contribution							
Reimbursables / Customer Contribution (enter as negative)				$ -	$ -	$ -	

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule	Total Float
CS00529 [redacted] DSCADA LTC Automation WO# (CS00529)			291	09-Dec-21 12 AM A	07-Feb-23 12 PM			0
CS00529.01 INITIALIZATION AND SCOPE DEVELOPEMENT			229	03-Jan-22 08 AM	30-Nov-22 08 AM			47
CS00529.01.09 Project Initiation			17	03-Jan-22 08 AM	26-Jan-22 12 PM			259
CS00529.01.09.3 EPAC Full Funding			17	03-Jan-22 08 AM	26-Jan-22 12 PM			259
EPAC-F	FF1000	EPAC Full Funding Approval	7	03-Jan-22 08 AM*	11-Jan-22 12 PM	Eversource Project		89
PPA-FF	FF1010	Full Funding PowerPlan Approval	10	11-Jan-22 12 PM	26-Jan-22 12 PM	Eversource Project		259
CS00529.01.12 T-Minus Milestones			223	10-Jan-22 04 PM	30-Nov-22 08 AM			0
CS00529.01.12.1 T-Minus Milestones "A"Electrical			223	10-Jan-22 04 PM	30-Nov-22 08 AM			0
	AT0404	ALL FINAL RELAY PROTECTIVE SETTING ISSUED	0		10-Jan-22 04 PM			323
ENG-DTL	A3560	Detail Design/Engineering Completed	0		03-Feb-22 04 PM			206
	AT1202	P/C DESCRIPTION / DRAFT OPERATING INSTRUCTIONS ISSUED	0		09-Feb-22 04 PM			293
	AT2404	DETERMINE / ASSIGN LCE (LEAD COMMISSIONING ENGINEER)	0		09-Feb-22 04 PM			293
AG-IFC	AT0805E	Elect IFC - Electrical (AG) w/Final BOM	0		02-Mar-22 04 PM			272
	AT0203	CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0		16-Mar-22 04 PM			258
	AT1201	SCADA Date (Tab) Sheets/Signal List Sent to LCC	0		01-Apr-22 04 PM			242
ENG-IFC	A3570	Final Engineering Issued for Construction W/BOM	0		01-Apr-22 04 PM			166
BG-IFC	AT0805P	P&C IFC - P&C w/BOM	0		01-Apr-22 04 PM			242
	AT0401	ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0		10-Aug-22 04 PM			111
	AT0409	ALL FIRM TOA APPLICATIONS DUE TO LCC (for DISTRIBUTION Non-transformer equipment)	0		31-Aug-22 04 PM			90
	AT1301	COMMISSIONING PLAN COMPLETE	0		08-Sep-22 04 PM			82
SOC	AT00	A-T-00 - START OF CONSTRUCTION - WO#	0	30-Nov-22 08 AM*				0
CS00529.05 ENGINEERING & DESIGN			78	09-Dec-21 12 AM A	01-Apr-22 04 PM			166
CS00529.05.02 Electrical Engineering			49	20-Dec-21 08 AM A	02-Mar-22 04 PM			188
	DSSE-200	Detail Electrical Design Package Design	18	20-Dec-21 08 AM A	14-Jan-22 04 PM			77
ES-DTL	DSSE-205	Detail Electrical Design Package Drafting	13	18-Jan-22 08 AM	03-Feb-22 04 PM			77
	DSSE-920	Operating Instructions - SSED Review Draft Convex OI	5	03-Feb-22 08 AM	09-Feb-22 04 PM			202



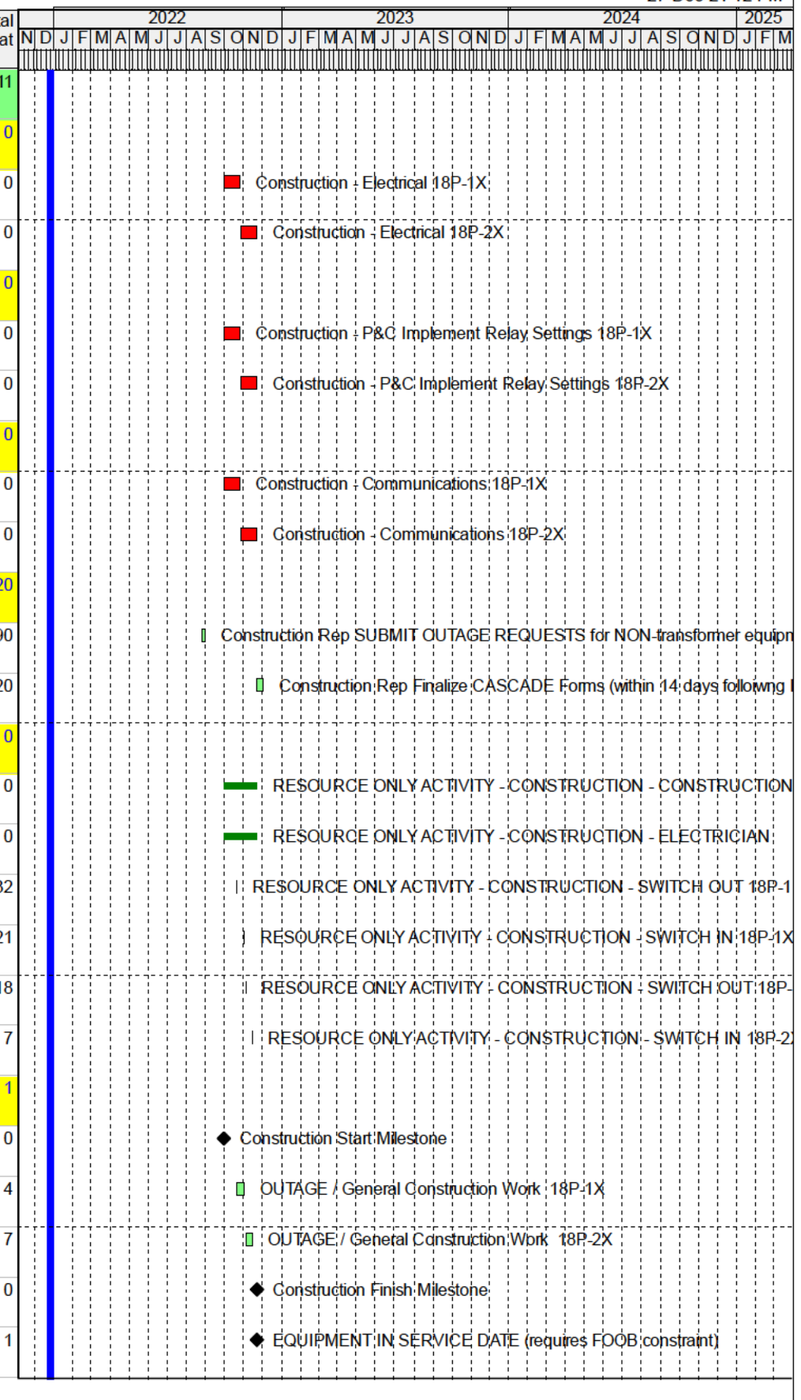
© Oracle Corporation

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule	Total Float
	DSSE-460	Operating Instructions - SSED Review Draft Distribution OI	5	03-Feb-22 08 AM	09-Feb-22 04 PM	[redacted]	[redacted]	202
ES-100%	DSSE-210	100% Electrical Design Package IFR	5	04-Feb-22 08 AM	10-Feb-22 04 PM			164
	DSSE-230	Electrical Engineering - BOM Complete	1	11-Feb-22 08 AM	11-Feb-22 04 PM			164
ES-IFC	DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	12	14-Feb-22 08 AM	02-Mar-22 04 PM			164
CS00529.05.04 P&C Engineering			78	09-Dec-21 12 AM A	01-Apr-22 04 PM			166
ES-PRELIM	A3380	Issue P&C Package Design	17	09-Dec-21 12 AM A	04-Jan-22 04 PM			101
	DSSE-450	Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	16	11-Jan-22 08 AM	02-Feb-22 04 PM			202
	DSSE-470	Operating Instructions - P&C Review Draft Distribution OI	5	03-Feb-22 08 AM	09-Feb-22 04 PM			202
	DSSE-930	Operating Instructions - P&C Review Draft Convex OI	5	03-Feb-22 08 AM	09-Feb-22 04 PM			202
	DSSE-480	P&C INITIATE CASCADE FORMS (Apenndix A) for Construction	20	03-Mar-22 08 AM	30-Mar-22 04 PM			164
	DSSE-990	P&C INITIATE SCADA Data Sheets	20	03-Mar-22 08 AM	30-Mar-22 04 PM			166
ES-IFC	DSSE-220	SDS Complete	2	31-Mar-22 08 AM	01-Apr-22 04 PM			166
CS00529.05.04.1 Relay Settings			4	05-Jan-22 08 AM	10-Jan-22 04 PM			202
ES-RSET	DSSE-440	Relay Settings - Prepare and Issue Relay Settings IFC	4	05-Jan-22 08 AM	10-Jan-22 04 PM			202
CS00529.06 MATERIAL PROCUREMENT			148	11-Jan-22 12 PM	10-Aug-22 04 PM			75
CS00529.06.01 MATERIAL FOR P&C			135	11-Jan-22 12 PM	24-Jul-22 12 PM			88
DR-RM	DSSE-510	MATERIAL - P&C - Prepare & Issue DR	5	11-Jan-22 12 PM	19-Jan-22 12 PM			92
	DSSE-980	MATERIAL - P&C - Procurement Issue PO	5	19-Jan-22 12 PM	24-Jan-22 12 PM	Purchasin Departme		129
	DSSE-1000	MATERIAL - P&C - Material Vendor Delivery Leadtime	180	24-Jan-22 12 PM	23-Jul-22 12 PM	Purchasin Departme		129
M-DELIV	DSSE-1010	MATERIAL - P&C - Confirm Material Delivery to Site	1	23-Jul-22 12 PM	24-Jul-22 12 PM	Purchasin Departme		129
CS00529.06.02 MATERIAL FOR ELECTRICAL			136	28-Jan-22 08 AM	10-Aug-22 04 PM			75
DR-RM	DSSE-520	MATERIAL - Electrical - Prepare & Issue DR	5	28-Jan-22 08 AM	03-Feb-22 04 PM			77
DR-AGMAT	DSSE-530	Electrical (AG) Material Ordered	0		03-Feb-22 04 PM			77
	DSSE-1020	MATERIAL - Electrical - Procurement Issue PO	5	04-Feb-22 08 AM	10-Feb-22 04 PM	Purchasin Departme		77
	DSSE-1030	MATERIAL - Electrical - Material Vendor Delivery Leadtime	180	11-Feb-22 08 AM	09-Aug-22 04 PM	Purchasin Departme		111
M-DELIV	DSSE-550	MATERIAL - Electrical -Confirm Material Delivery to Site	1	10-Aug-22 08 AM	10-Aug-22 04 PM	Purchasin Departme		111



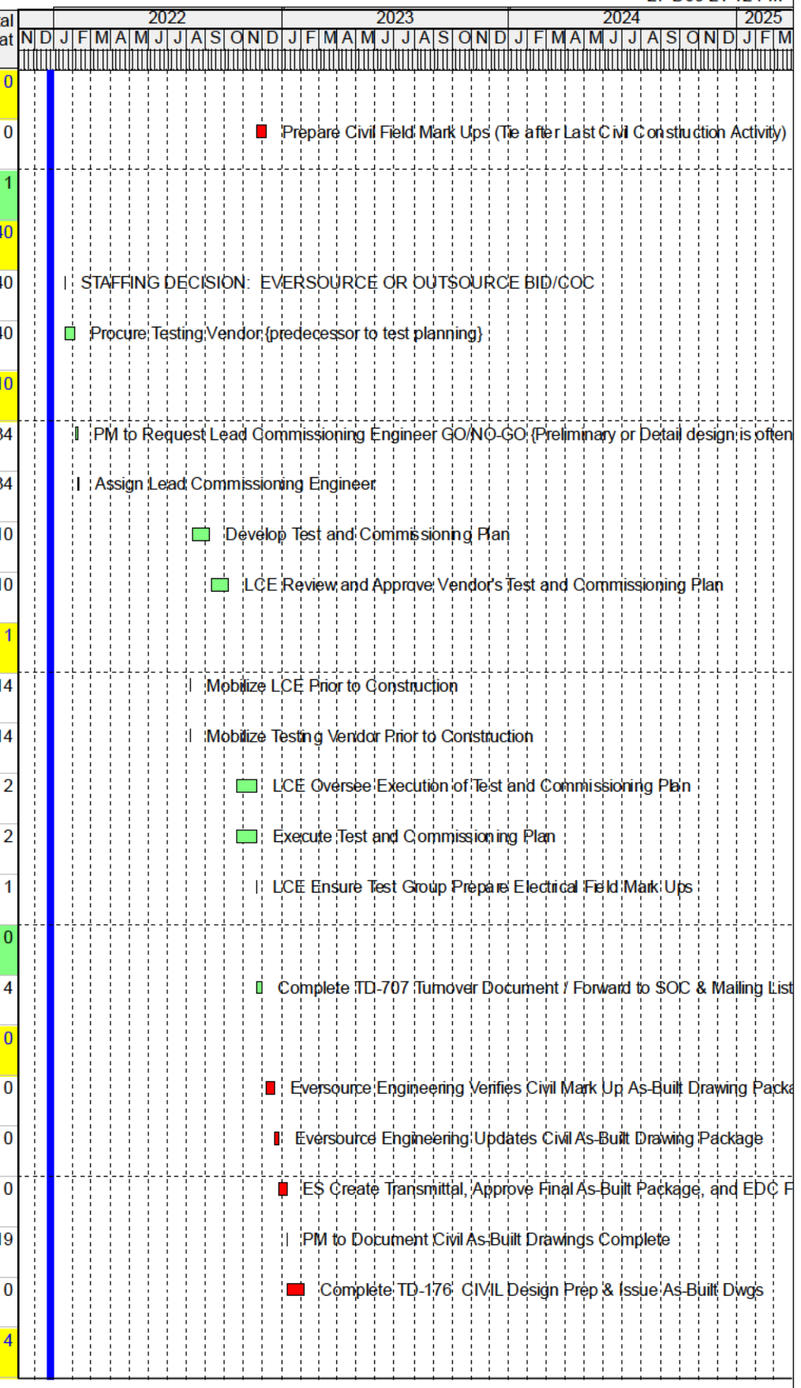
© Oracle Corporation

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule	Total Float
CS00529.07 CONSTRUCTION			70	26-Aug-22 08 AM	07-Dec-22 12 PM			11
CS00529.07.02 CONSTRUCTION - ELECTRICAL			54	30-Sep-22 08 AM	22-Nov-22 12 PM			0
	A1130	Construction - Electrical 18P-1X	26	30-Sep-22 08 AM*	25-Oct-22 04 PM	Const Rep Field Sup - S/S		0
	A1135	Construction - Electrical 18P-2X	25	28-Oct-22 12 PM*	22-Nov-22 12 PM	Const Rep Field Sup - S/S		0
CS00529.07.03 CONSTRUCTION - P&C			54	30-Sep-22 08 AM	22-Nov-22 12 PM			0
	A1140	Construction - P&C Implement Relay Settings 18P-1X	26	30-Sep-22 08 AM*	25-Oct-22 04 PM	Constructio Rep		0
	A3615	Construction - P&C Implement Relay Settings 18P-2X	25	28-Oct-22 12 PM*	22-Nov-22 12 PM	Constructio Rep		0
CS00529.07.04 CONSTRUCTION - COMMUNICATIONS			54	30-Sep-22 08 AM	22-Nov-22 12 PM			0
	A1150	Construction - Communications 18P-1X	26	30-Sep-22 08 AM*	25-Oct-22 04 PM	Constructio Rep		0
	A3620	Construction - Communications 18P-2X	25	28-Oct-22 12 PM*	22-Nov-22 12 PM	Constructio Rep		0
CS00529.07.92 CONSTRUCTION - CONST.REP TASKS			99	26-Aug-22 08 AM	02-Dec-22 12 PM			20
	A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage)	6	26-Aug-22 08 AM*	31-Aug-22 04 PM	Constructio Rep		90
	A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10	22-Nov-22 12 PM	02-Dec-22 12 PM	Constructio Rep		20
CS00529.07.94 CONSTRUCTION RESOURCE TRACKING			54	30-Sep-22 08 AM	22-Nov-22 12 PM			0
	ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	54	30-Sep-22 08 AM	22-Nov-22 12 PM	Constructio Rep		0
	CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	54	30-Sep-22 08 AM	22-Nov-22 12 PM	Distribution - S/S		0
	A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT 18P-1X	1	21-Oct-22 08 AM*	21-Oct-22 04 PM	Distribution Switching		32
	A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN 18P-1X	1	01-Nov-22 08 AM*	01-Nov-22 04 PM	Distribution Switching		21
	A3625	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT 18P-2X	1	04-Nov-22 08 AM*	04-Nov-22 04 PM	Distribution Switching		18
	A3630	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN 18P-2X	1	15-Nov-22 08 AM*	15-Nov-22 04 PM	Distribution Switching		7
CS00529.07.96 CONSTRUCTION OUTAGES			54	30-Sep-22 08 AM	22-Nov-22 12 PM			1
CRH	CSM	Construction Start Milestone	0	30-Sep-22 08 AM*				0
OUT	TOA-Const 18P-1X	OUTAGE / General Construction Work 18P-1X	12	21-Oct-22 08 AM*	01-Nov-22 04 PM	Constructio Resources		4
OUT	TOA-Const 18P-2X	OUTAGE / General Construction Work 18P-2X	12	04-Nov-22 08 AM*	15-Nov-22 04 PM	Constructio Resources		7
	CFM	Construction Finish Milestone	0		22-Nov-22 12 PM			0
ISD	ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0		22-Nov-22 12 PM*			1



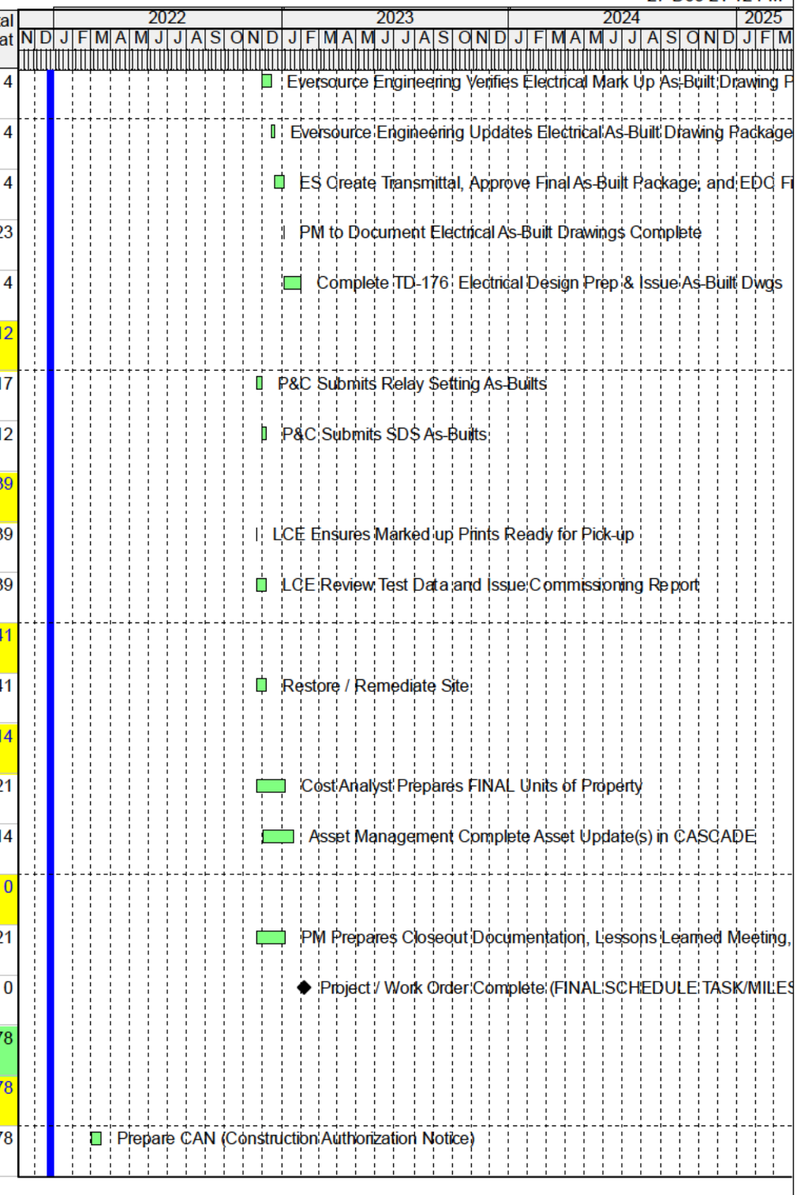
© Oracle Corporation

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule	Total Float
CS00529.07.98 CONSTRUCTION CLOSEOUT			10	22-Nov-22 12 PM	07-Dec-22 12 PM			0
	DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	10	22-Nov-22 12 PM	07-Dec-22 12 PM	Constructio Resources		0
CS00529.09 TEST AND COMMISSION			215	18-Jan-22 08 AM	22-Nov-22 12 PM			1
CS00529.09.01 TEST - SERVICES STAFFING DECISION			11	18-Jan-22 08 AM	01-Feb-22 04 PM			140
	A1010	STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/COC	1	18-Jan-22 08 AM	18-Jan-22 04 PM	Lubor Stonawski,		140
	A3250	Procure Testing Vendor {predecessor to test planning}	10	19-Jan-22 08 AM	01-Feb-22 04 PM	Lubor Stonawski		140
CS00529.09.02 LCE PLANNING			172	04-Feb-22 08 AM	07-Oct-22 04 PM			10
	LCE100	PM to Request Lead Commissioning Engineer GO/NO-GO {Preliminary or Detail design is often the predecessor}	2	04-Feb-22 08 AM	07-Feb-22 04 PM	Lubor Stonawski		134
	LCE200	Assign Lead Commissioning Engineer	2	08-Feb-22 08 AM	09-Feb-22 04 PM	David LaFargue		134
	LCE400	Develop Test and Commissioning Plan	21	10-Aug-22 08 AM	08-Sep-22 04 PM	CT/WMA Test		10
	LCE500	LCE Review and Approve Vendor's Test and Commissioning Plan	21	09-Sep-22 08 AM	07-Oct-22 04 PM	David LaFargue		10
CS00529.09.04 TEST ACTIVITIES			74	08-Aug-22 08 AM	22-Nov-22 12 PM			1
	LCE310	Mobilize LCE Prior to Construction	2	08-Aug-22 08 AM*	09-Aug-22 04 PM	David LaFargue		14
	LCE320	Mobilize Testing Vendor Prior to Construction	2	08-Aug-22 08 AM*	09-Aug-22 04 PM	CT/WMA Test		14
	LCE610	LCE Oversee Execution of Test and Commissioning Plan	21	21-Oct-22 08 AM	21-Nov-22 12 PM	David LaFargue		2
	LCE620	Execute Test and Commissioning Plan	21	21-Oct-22 08 AM	21-Nov-22 12 PM	Engineering Contractor		2
	LCE700	LCE Ensure Test Group Prepare Electrical Field Mark Ups	0	22-Nov-22 12 PM	22-Nov-22 12 PM	David LaFargue		1
CS00529.10 PROJECT CLOSE OUT			51	22-Nov-22 12 PM	07-Feb-23 12 PM			0
	DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5	22-Nov-22 12 PM	30-Nov-22 12 PM	Constructio Rep		4
CS00529.10.01 Civil As-Builts			41	07-Dec-22 12 PM	07-Feb-23 12 PM			0
	DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	10	07-Dec-22 12 PM	21-Dec-22 12 PM	Robert M. Niemiec		0
	DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	3	21-Dec-22 12 PM	27-Dec-22 12 PM	Robert M. Niemiec		0
ES-ASB	DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	8	27-Dec-22 12 PM	09-Jan-23 12 PM	Robert M. Niemiec		0
	DSSE-880	PM to Document Civil As-Built Drawings Complete	1	09-Jan-23 12 PM	10-Jan-23 12 PM	Lubor Stonawski		19
	DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	20	09-Jan-23 12 PM	07-Feb-23 12 PM	Robert M. Niemiec		0
CS00529.10.02 Electrical As-Builts			42	30-Nov-22 12 PM	01-Feb-23 12 PM			4



© Oracle Corporation

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule	Total Float
	DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	10	30-Nov-22 12 PM	14-Dec-22 12 PM	[redacted]	[redacted]	4
	DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	3	14-Dec-22 12 PM	19-Dec-22 12 PM			4
ES-ASB	DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	9	19-Dec-22 12 PM	03-Jan-23 12 PM			4
	DSSE-840	PM to Document Electrical As-Built Drawings Complete	1	03-Jan-23 12 PM	04-Jan-23 12 PM			23
	DSSE-1110	Complete TD-176 Electrical Design Prep & Issue As-Built Dwgs	20	03-Jan-23 12 PM	01-Feb-23 12 PM			4
CS00529.10.03 P&C As-Builts			10	22-Nov-22 12 PM	07-Dec-22 12 PM			12
	DSSE-960	P&C Submits Relay Setting As-Builts	5	22-Nov-22 12 PM	30-Nov-22 12 PM			17
	DSSE-950	P&C Submits SDS As-Builts	5	30-Nov-22 12 PM	07-Dec-22 12 PM			12
CS00529.10.04 Test Closout			11	22-Nov-22 12 PM	08-Dec-22 12 PM			39
	LCE800	LCE Ensures Marked up Prints Ready for Pick-up	1	22-Nov-22 12 PM	23-Nov-22 12 PM			39
	LCE900	LCE Review Test Data and Issue Commissioning Report	10	23-Nov-22 12 PM	08-Dec-22 12 PM			39
CS00529.10.05 SITE RESTORATION CLOSEOUT			10	22-Nov-22 12 PM	07-Dec-22 12 PM			41
	A1110	Restore / Remediate Site	10	22-Nov-22 12 PM	07-Dec-22 12 PM	CT/WMA C Contractor-		41
CS00529.10.06 MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT			37	22-Nov-22 12 PM	18-Jan-23 12 PM			14
	A1020	Cost Analyst Prepares FINAL Units of Property	30	22-Nov-22 12 PM	06-Jan-23 12 PM	CT- Cost Analyst		21
	A1030	Asset Management Complete Asset Update(s) in CASCADE	30	02-Dec-22 12 PM	18-Jan-23 12 PM			14
CS00529.10.07 PROJECT MANAGEMENT CLOSEOUT			51	22-Nov-22 12 PM	07-Feb-23 12 PM			0
	A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30	22-Nov-22 12 PM	06-Jan-23 12 PM			21
	FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0		07-Feb-23 12 PM			0
CS00529.13 OVERHEAD / INDIRECTS			10	03-Mar-22 08 AM	16-Mar-22 04 PM			178
CS00529.13.01 PROJECT MANAGEMENT			10	03-Mar-22 08 AM	16-Mar-22 04 PM			178
	A1170	Prepare CAN (Construction Authorization Notice)	10	03-Mar-22 08 AM	16-Mar-22 04 PM			178



© Oracle Corporation

EVERSOURCE

Constructability Review Form: **Substation**

Project Title: [redacted] Dscada LTC	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS	**Project Constructability Phase:**	
Date(s) of Constructability Review: **10/29/2021**	☒ Conceptual Engineering Design	
Click to enter a date	☐ Preliminary Engineering Design	
	☐ Detailed Engineering Design	
Project Scope Statement: Install DSCADA equipment for the [redacted]		

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	[redacted]
☐	☒	Constr. Management	[redacted]	☐	☐	Civil Engineering	
☐	☐	S/S Technical / LCE		☐	☐	Telecom	
☐	☒	S/S Operations**	[redacted]	☐	☐	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] _____*10/29/21*_____ *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	None	
2		
3		
4		
5		

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

EVERSOURCE

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.)		None
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 [redacted]

[redacted]

[redacted]. The list of substations and associated LTC transformers is provided in Attachment 1. [redacted] ccordingly, 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, [redacted] CS00433, [redacted] CS00432 and [redacted] 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]. A simplified one-line of the radio system (CONVEX LMS system) can be found in Figure 1. Pictures of the obsolete radio receivers 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.

[redacted]



- 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



Comverge™, the company that provides Eversource with replacement software and hardware for the radio system, has limited availability of system components used by Eversource. They cannot guarantee future logistic and technical support. Hubbell™ that supplies hardware to organize the handshake mechanism for our phone lines is discontinuing availability and support for the system currently in use.

Business Process and / or Technical Improvements:

As the future of the grid evolves, remote voltage control will become critical to meet the requirements for Distributed Generation systems and provide energy savings. In addition to the ability to remotely control voltage at the LTCs, it is anticipated that remote control of the distribution capacitors and regulators will become necessary in the future (not part of this project). Adding this functionality to the LTCs as part of this DSCADA project is the most cost-effective manner for this work to be done.

Alternatives Considered

Eversource evaluated the following three alternatives:

[redacted]

Cost estimate $554,100 (planning grade)

[redacted]

[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	Equip Position
[redacted]			
TOTAL UNITS		9	

EVERSOURCE

Planned LTC Releases for 2022

Substation Name	Project Number	LTC Control	Equip Position
[redacted]			
TOTAL UNITS		13	

Planned LTC Releases for 2023

Substation Name	Project	LTC Control	Equip
[redacted]			

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

Engineer and Upgrade LTC	Estimated In Service Date
10 Transformers	12/31/2024
10 Transformers	12/31/2025
10 Transformers	12/31/2026
10 Transformers	12/31/2027
10 Transformers	12/31/2028
10 Transformers	12/31/2029
9 Transformers	12/31/2030
69 Transformers	TOTAL UNITS

Regulatory Approvals

No advance regulatory approval is required for this project.

Risks and Risk Mitigation Plans

[redacted]

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
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	$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:

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. 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.

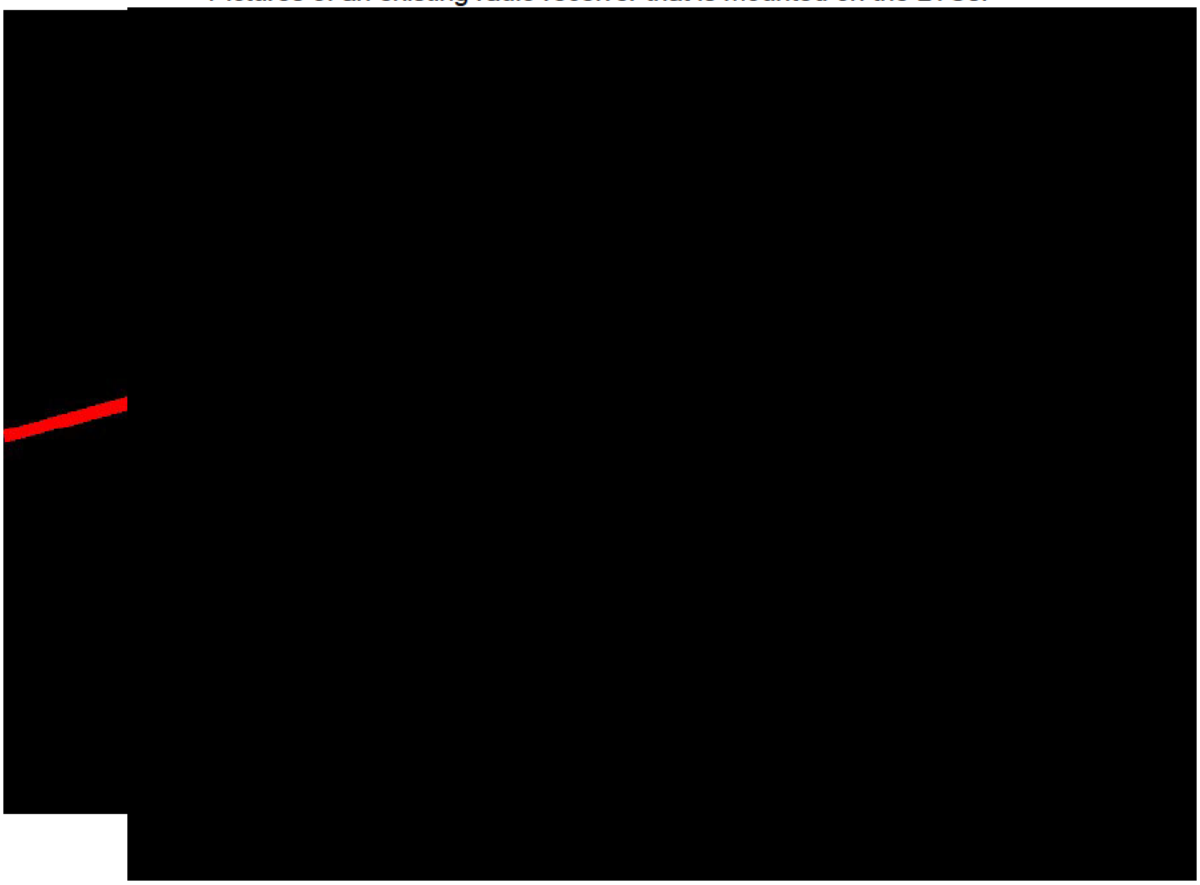
Adjust risk and contingency. Risk currently at 12.8% adjust risk to 10% of total and add contingency to 4% of total.

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:

