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Program Release Form

Approved on December 22, 2021 EPAC

Link to Meeting Minutes

Date Prepared: 12/16/2021	**Project Title: DSCADA LTC Controls Upgrade** [redacted]
Company: Eversource CT	**Facility Name:** [redacted]
Organization: Asset Management	**Project Number: CS00522**
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: $904K	**Estimated in service date(s): 09/30/2022**
	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 $904K to [redacted]

The Program Level PAF CS00407 had $250K of initial funding approved in PowerPlan on May 25, 2021. As of December 13, 2021, minor costs have accrued under WO 80134682 for

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

Project Scope

[redacted]

Primary equipment outages are required for this work requiring approximately five (5) days per unit.

Scope of Work

[redacted]

Major Material to be Purchased

1. Two (2) LTC DSCADA Cabinet Remote Terminal Units (RTU) (one (1) unit for each transformer) are Axion Module RTU SEL-2240 for controlling all I/O DSCADA send/receive and are mounted inside the new DSCADA cabinet located next to existing LTC cabinet at the transformer.
2. Two (2) LTC tap position monitors (one (1) for each transformer) are INCON 1511 LTC-4-S and are mounted inside the new DSCADA cabinet located next to existing LTC cabinet at the transformer.
3. Two (2) M-2001D Beckwith tap changer controls; no adapter panels are required.

A constructability review was performed on October 8, 2021 (see Attachment C).

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	$35	$21	($15)
6. Materials (Eversource purchased)	$52	$41	($11)
7. Construction (incl matl's by contractors)	$252	$219	($33)
8. Testing /Commissioning	$188	$152	($36)
9. Project Mgmt Team	$22	$8	($14)
10. Removals	$5	$9	$4
11. Other	$	$0	$
12. Risks	$142	$67	($75)
SUBTOTAL DIRECTS W/ RISKS	**$702**	**$518**	**($185)**
13. Indirects/Overhead	$377	$341	($36)
14. AFUDC	$29	$23	($6)
PROJECT TOTAL – BASELINE BUDGET	**$1,108**	**$882**	**($227)**
15. Contingency	$	$23	$23
***TOTAL CAPITAL REQUEST**	**$1,108**	**$904**	**($204)**
16. Reimbursables/Customer Contribution	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$1,108**	**$904**	**($204)**
O&M	$		
Total Request	**$1,108**	**$904**	**($204)**

*CT program unit cost (Option #3) is $554,100 per transformer (upgrade, new conduit, and new control) and has been used in the unitized PAF cost for the [redacted] 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: ($15K) -** No major changes from Program Level PAF. Savings recognized in economies of scale.
6. **Materials (by Eversource): ($11K) -** No major changes from Program Level PAF.
7. **Construction (including materials supplied by contractors): ($33K)** – decreased labor and materials for construction support based on vendor quotes unique to this release, adapter panels being reused.
8. **Testing / Commissioning: ($36K) –** Savings recognized in economies of scale and decreased labor for testing/commissioning support based on vendor quotes.
9. **Project Management Team: ($14K)** Savings recognized in economies of scale.
10. **Removals: $4K –** No major changes from the Program Level PAF.
11. **Other: $0 –** No changes from the Program Level PAF.
12. **Risk: ($75K) –**. Savings recognized in economies of scale.
13. **Indirects/Overhead: ($36K) –** Indirects are proportional to direct costs.
14. **AFUDC: ($6K) –** AFUDC is proportional to direct costs.
15. **Contingency: $23K –** Contingency was not included in the Program Level unitized cost but is included to account for 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 to Go	2022	Total
1. ROW / Easements / Land Acquisition	$		$	$	$
2. Environmental Approvals / Permits	$		$	$	$
3. Outreach	$		$	$1	$1
4. Siting Approvals / Permits	$		$	$	$
5. Engineering / Design	$		$16	$5	$21
6. Materials (Eversource purchased)	$		$39	$2	$41
7. Construction (incl matl's by contractors)	$		$	$219	$219
8. Testing / Commissioning	$		$	$152	$152
9. Project Mgmt Team	$		$5	$4	$8
10. Removals	$		$	$9	$9
11. Other	$		$	$	$
12. Risks	$		$14	$53	$67
SUBTOTAL DIRECTS W/ RISKS	**$250**		**$73**	**$445**	**$518**
13. Indirects/Overhead	$		$48	$293	$341
14. AFUDC	$		$1	$21	$23
PROJECT TOTAL – BASELINE BUDGET	**$250**		**$123**	**$759**	**$882**
15. Contingency	**$**		**$**	$23	$23
TOTAL CAPITAL REQUEST	**$250**		**$123**	**$782**	**$904**
16. Reimbursables/Customer Contribution	$	$	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$250**		**$123**	**$782**	**$904**
O&M	$	$	$	$	$
TOTAL REQUEST	**$250**		**$123**	**$782**	**$904**

Risk of $67K included for potential UG obstructions ($20K), severe weather, delays, and OT ($30K) and design development ($17K).

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Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021	2022	Total
ST Labor		$	$15	$17	$32
OT Labor					
Outside Services Labor			$5	$363	$368
Materials*			$39	$2	$41
Removals				$9	$9
Other			$15	$76	$91
Indirects			$48	$293	$341
AFUDC			$1	$21	$23
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$250**	**$**	**$123**	**$782**	**$904**

*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

Risks and Risk Mitigation Plans

[redacted]

Contingency

$23K contingency is included for project unknowns.

Project Schedule

Milestone/Phase Name	Estimated Dates
Program Level Initial Funding Approval (CS00407)	May 2021
EPAC Meeting – Release Presentation	December 22, 2021
Engineering IFC - Completed	April 26, 2022
Electrical Material Received	August 6, 2022
Electrical Construction Start	August 8, 2022
Construction Completion	September 30, 2022
ISD	September 30, 2022

See Attachment B for the P6 schedule.

References

OP-13 Standards for Voltage Reduction and Load Shedding – ISO New England Operating Procedure 08022019

Attachments

- Attachment A – Engineering Estimate [redacted] DSCADA LTC Upgrades CS00522 Rev0
- Attachment B – [redacted] CS00522 P6 Schedule 12082021
- Attachment C – Substation Constructability Review Form CS00522 [redacted] 10082021
- Attachment D – [redacted] Nomenclature Diagram
- 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: DSCADA LTC Controls Upgrade [redacted]				**Project Number: CS00522**		
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?				Yes		
Is a Transient Over Voltage (TOV) analysis required?				No		

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Project Checklist - Transmission & Substation Capital Project	
Project Name: DSCADA LTC Controls Upgrade [redacted]	**Project Number: CS00522**

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] SCADA LTC UPGRADEs
Project Mgr/Lead: [redacted]

Project Number: CS00522
WO & Task #: 80134682
Estimate revision #: 0
Estimate Type - Station work

Estimate #: C- xxx-xx
Date of Estimate:11/22/2021

Estimate done by: [redacted]
In Service date (ISD): 12/30/2022

Template Revision # 01.05d

Alt Estimate Summary for PP4 Calc (escalation separate)

Estimate #: C- xxx-xx
Date of Estimate:11/22/2021

Project Number: CS00522
WO & Task #: 80134682

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	$20,600	4.0%	2.3%		$15,600	$5,000								
6	Materials (Eversource purchased)	$40,700	7.9%	4.5%		$38,700	$2,000								
7	Construction (incl mat'l's by contractors)	$219,500	42.4%	24.3%			$219,500								
8	Testing / Commissioning	$152,100	29.4%	16.8%			$152,100								
9	PMT Project Mgmt Team	$8,300	1.6%	0.9%		$4,500	$3,800								
10	Removals	$8,900	1.7%	1.0%			$8,900								
11	Other														
12	Risks	$67,000	12.9%	7.4%		$14,000	$53,000								
125															
	Project Directs Total w/Risks	**$518,000**	100.0%	57.3%		**$72,900**	**$445,100**								
13	Indirects/Overhead	$341,000		37.7%		$48,400	$292,600								
14	AFUDC	$22,700		2.5%		$1,500	$21,200								
155															
	Project Total - Baseline Budget	**$881,700**		97.5%		**$122,800**	**$758,900**								
15	Contingency	$22,500		2.5%			$22,500								
	Project Total - Funding Approval Level	**$904,200**		100.0%		**$122,800**	**$781,400**								
16	Reimbursables/Customer Contribution														
166															
	Project Total (less reimbursables)	**$904,200**				**$122,800**	**$781,400**								
	Cost per key qty (if appl)	452,100	$'s / EA												
	Amount of Escalation included above	$19,900					$19,900								
6	Total materials - Eversource	$40,700				$38,700	$2,000								
	Total materials - Contractor														
	Total materials	$40,700				$38,700	$2,000								

NOTE: Risk / Contingency is 11% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)

Estimate Range	**-25%**	**25%**
	$678,000	**$1,130,000**

	TOTAL w/ escal broken out
ROW / Easements / Land purchas	$ -
Environmental Approvals / Permit	$ -
Outreach	$ 900
Siting Approvals / Permits	$ -
Engineering / Design	$ 20,500
Materials (Eversource purchased)	$ 40,700
Construction (incl mat'l's by contr	$ 213,100
Testing / Commissioning	$ 147,700
PMT Project Mgmt Team	$ 8,200
Removals	$ 8,600
Other	$ -
Risks	$ 67 000
	$506,700
Indirects/Overhead	$ 332,500
AFUDC	$ 22,700
	$ -
	$861,900
	$ -
Contingency	$ 22,500
	$884,400
	$ -
	$ -
	$ -
	$884,400
	$ 19,900
Escal total	**$904,300**
Check total	$100

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.
- Two (02) M-2001D Beckwith tap changer controls only ***not Adaptor Panel***.

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 not be modified and will not be taken back to the SEL-2240 Axion.

RISKS

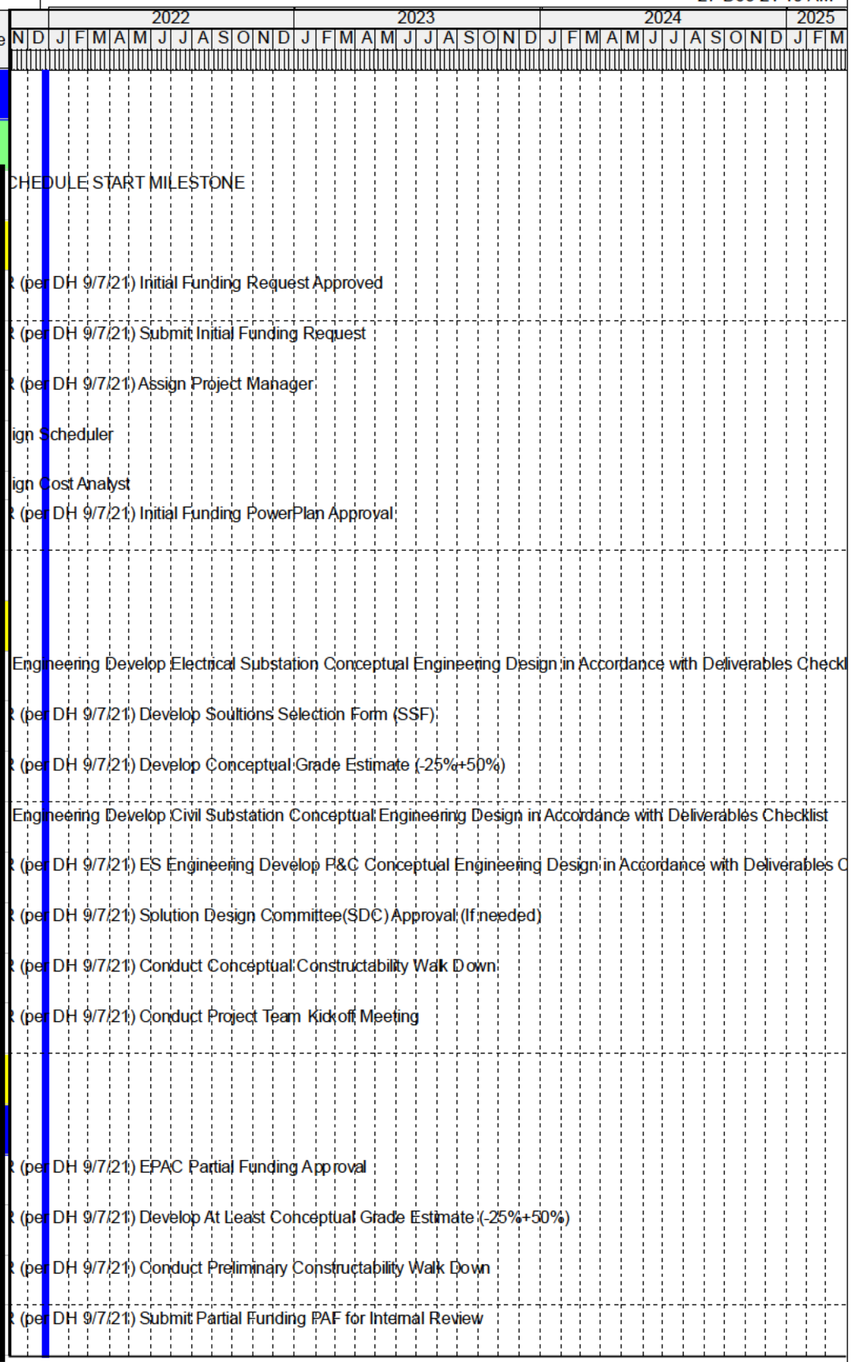
Potential UG Obstructions	$ 20.000
Severe Weather. Delays. OT	$ 30.000
Design development & Field mark Up Changes	$ 17.000

UNESCALATED LINE ITEM DOLLARS

Proiect Number CS00522
Date of Estimate 11/22/2021
Estimate revision # 0

				Escalation Rate		E Rate $ 53							
					Prior		21		022	1		TOTAL	
CSTXX-CONSTRUCTION	**R**			**Mhrs**	**DOLLARS**		**DOLLARS**		**DOLLARS**			**DOLLARS**	
Electrical Construction	LT												
General Construction	LT												
SCADA / Automation	LT								$4,240			$4,240	
Telecom - Field	LT												
Construction Reps (internal)	LT								$1,908			$1,908	
Support Switch/Tag	LT								$3,816			$3,816	
Other (specify)	LT												
Other (specify)	LT												
Other (specify)	LT												
LT Total									$9,964			$9,964	
Employee Expenses	AE	5%							$498			$498	
Construction Purchased Material	AM	1%							$1,975			$1,975	
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								$5,184			$5,184	
Rents and Leases	BR												
CSTXX Subtotal									$215,075			$215,075	
Escalation													
CSTXX Total									$215,075			$215,075	
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						$1,272		$424			$1,696	
Substation (T) Engineering/Design	LT												
Substation (D) Engineering/Design	LT						$4,240		$1,272			$5,512	
Protection & Controls Engineering	LT						$3,392		$424			$3,816	
Survey Engineering	LT												
SCADA / Automation Engineering	LT												
Telecom Engineering	LT						$1,272		$848			$2,120	
Other - PP Actuals	LT												
Other - Project Engineer	LT						$1,272		$848			$2,120	
LT Total							$14,840		$4,664			$19,504	
Employee Expenses	AE	5%					$742		$233			$975	
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							$15,582		$4,897			$20,479	
Escalation													
ENRXX Total							$15,582		$4,897			$20,479	
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						$37,200					$37,200	
Outside Services	AM												
	AM												
Freight													
Sales Tax Eversouce/outside services	3.9%	3.9%					$1,500					$1,500	
Other													
MATXX Subtotal							$38,700					$38,700	
Escalation													
MATXX Total							$38,700					$38,700	
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		$38			$43	
Legal	LT												
Estimating	LT								$2,120			$2,120	
Siting - Local Zoning	LT												
Asset Management	LT												
Other -	LT												
Other -	LT												
Other -	LT												
Other -	LT												
LT Total							$5		$2,158			$2,163	
Employee Expenses	AE	5%							$108			$108	
Project Support Vendor - PM	AQ						$4,500		$1,500			$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		$710			$810	
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							$4,605		$4,476			$9,081	
Escalation													
PSMXX Total							$4,605		$4,476			$9,081	
REMXX-TG REMOVAL													
Engineering/Design	LT												
Internal Construction	LT												
LT Total													
Employee Expenses	AE	15%											
Outside Services	AQ												
Contractor Labor	AQ								$8,640			$8,640	
Vehicles (now in indirects section)	AV												
Rents and Leases	BR												
REMXX Subtotal									$8,640			$8,640	
Escalation													
REMXX Total									$8,640			$8,640	
TSTXX-TG TEST													
Test / Field Engr. Labor (In House)	LT												
Lead Commissioning Engr. (LCE) (internal)	LT												
Employee Expense	AE	10%							$93,600			$93,600	
Test / Field Engr. Labor (contractor)	AQ												
Lead Commissioning Engr. (LCE) (contactor)	AQ								$54,080			$54,080	
Vehicles (now in indirects section)	AV												
TSTXX Subtotal									$147,680			$147,680	
Escalation													
TSTXX Total									$147,680			$147,680	
SUBTOTAL PROJECT DIRECT COST				-			**$58,887**		**$380,768**		**,485**	**$439,655**	
Risk													
Risk							$14,000		$53,000			$67,000	
							$ -		$ -				
							$ -		$ -				
Risk Total							$14,000		$53,000			$67,000	
TOTAL PROJECT DIRECT COST (w risk)				-			**$72,887**		**$433,768**		**,485**	**$506,655**	
INDIRECTS													
Non-Productive Time Allocation (**ZNP**)	15.1%						$2,234		$2,526			$4,760	
Payroll Benefits Allocation (**ZPB**) incl NPT	44.0%								$5,044			$5,044	
Gen SVC CO Overhead (**ZGS**) incl NPT	75.0%						$12,809		$5,887			$18,696	
E&S Allocations (**ZE0,ZEL,ZES**)	60.0%						$20,693		$234,847			$255,540	
AS&E Allocations (**ZAS**)	1.3%						$1,183		$7,863			$9,046	
Stores Expense Allocation (**ZST**)	8.0%						$2,976					$2,976	
Lobby Stock													
MDEC (**ZMI**)	6.0%						$4,346		$23,194			$27,540	
Vehicles (**ZVE**)	28.0%						$4,157		$4,700			$8,857	
Indirects Subtotal							$48,398		$284,061			$332,459	
TOTAL PROJECT COST - Direct & Indirect (excl AFUDC)							**$121,285**		**$717,829**			**$839,114**	
AFUDC													
AFUDC (ZK)						4.81%	$1,458	4.81%	$21,237	0		$22,695	
In Service Dollars													
Cumulative ISS						-		-					
AFUDC Subtotal							$1,458		$21,237			$22,695	
TOTAL PROJECT COST - Baseline Budget							**$122,743**		**$739,066**			**$861,809**	
Contingecy													
Contingency									$22,517			$22,517	
Other					$ -		$ -		$ -				
Contingency SubTotal									$22,517			$22,517	
TOTAL PROJECT COST - Approved Funding							**$122,743**		**$761,583**			**$884,326**	
Reimbursables / Customer Contribution													
Reimbursables / Customer Contribution (enter as negative)					$ -		$ -		$ -				

Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
80134682 [redacted] DSCADA LTC Automation (CS00522)			320	07-Sep-21 12 AM A	15-Dec-22 04 PM		
80134682.01 INITIALIZATION AND SCOPE DEVELOPEMENT			230	07-Sep-21 12 AM A	08-Aug-22 08 AM		
	START	SCHEDULE START MILESTONE	0	20-Sep-21 08 AM A			
80134682.01.01 Initial Funding			0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
EPAC-I	PI1300	N/R (per DH 9/7/21) Initial Funding Request Approved	0		07-Sep-21 12 AM A		
	PI1000	N/R (per DH 9/7/21) Submit Initial Funding Request	0		07-Sep-21 12 AM A		
PM-AM	PI1400	N/R (per DH 9/7/21) Assign Project Manager	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	PI1500	Assign Scheduler	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	PI1600	Assign Cost Analyst	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
PPA-IF	PI1010	N/R (per DH 9/7/21) Initial Funding PowerPlan Approval	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	Project	
	PI1200	N/R (per DH 9/7/21) Project Initiator Develop Intitial Funding Request	0	07-Sep-21 08 AM A	07-Sep-21 12 AM A		
80134682.01.02 SDC Approval			0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
ES-CONCPT	CE1100	ES Engineering Develop Electrical Substation Conceptual Engineering Design in Accordance with Deliverables Checklist	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	SUBSTATI ENGINEER	
	SSF1000	N/R (per DH 9/7/21) Develop Soultions Selection Form (SSF)	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
EST-SDC	CGE1000	N/R (per DH 9/7/21) Develop Conceptual Grade Estimate (-25%+50%)	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	Generic Estimating	
ES-CONCPT	CE1000	ES Engineering Develop Civil Substation Conceptual Engineering Design in Accordance with Deliverables Checklist	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	CT-SS Civil Designer	
ES-CONCPT	CE1400	N/R (per DH 9/7/21) ES Engineering Develop P&C Conceptual Engineering Design in Accordance with Deliverables Checklist	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	CT- P&C Engineer	
SDC	SDC1000	N/R (per DH 9/7/21) Solution Design Committee(SDC) Approval (If needed)	0		07-Sep-21 12 AM A		
	CE1710	N/R (per DH 9/7/21) Conduct Conceptual Constructability Walk Down	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	CE1600	N/R (per DH 9/7/21) Conduct Project Team Kickoff Meeting	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
80134682.01.09 Project Initiation			95	07-Sep-21 12 AM A	25-Jan-22 12 PM		
80134682.01.09.2 EPAC Partial Funding			0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
EPAC-P	PF1000	N/R (per DH 9/7/21) EPAC Partial Funding Approval	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	Eversource Project	
EST-PART	ATCGE1010	N/R (per DH 9/7/21) Develop At Least Conceptual Grade Estimate (-25%+50%)	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	Generic Estimating	
	PE1700	N/R (per DH 9/7/21) Conduct Preliminary Constructability Walk Down	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	PAFP1000	N/R (per DH 9/7/21) Submit Partial Funding PAF for Internal Review	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		



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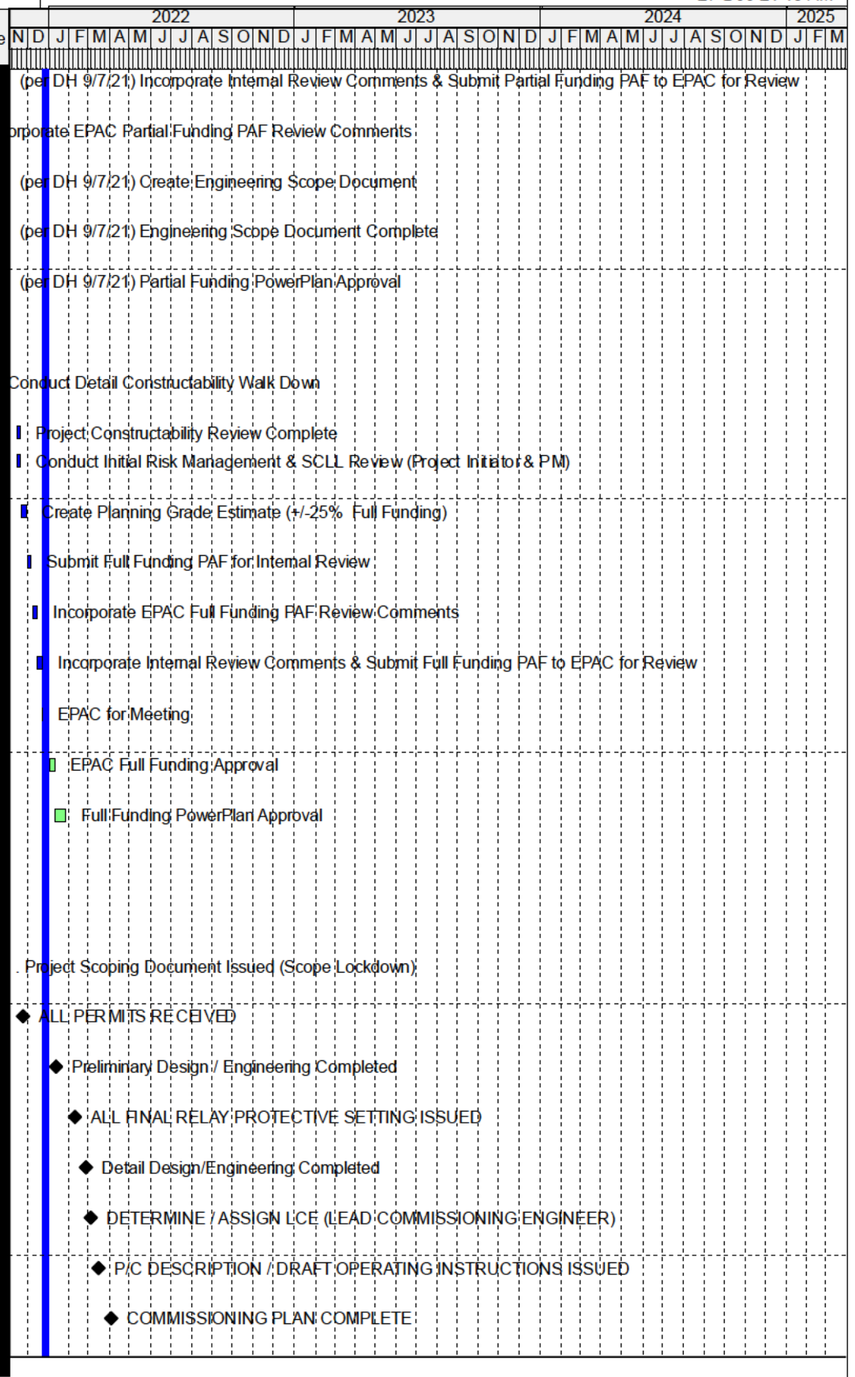
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
	PAFP1100	N/R (per DH 9/7/21) Incorporate Internal Review Comments & Submit Partial Funding PAF to EPAC for Review	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	PAFP1200	Incorporate EPAC Partial Funding PAF Review Comments	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A		
	PE1710	N/R (per DH 9/7/21) Create Engineering Scope Document	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	CT- Project Engineer Generic	
Scope Comp	PE1720	N/R (per DH 9/7/21) Engineering Scope Document Complete	0		07-Sep-21 12 AM A		
PPA-PF	PF1010	N/R (per DH 9/7/21) Partial Funding PowerPlan Approval	0	07-Sep-21 12 AM A	07-Sep-21 12 AM A	Eversource Project Approval	
80134682.01.09.3 EPAC Full Funding			72	08-Oct-21 08 AM A	25-Jan-22 12 PM		
	DE1900	Conduct Detail Constructability Walk Down	1	08-Oct-21 08 AM A	08-Oct-21 04 PM A		
Construct	DE2000	Project Constructability Review Complete	5	15-Nov-21 08 AM A	19-Nov-21 04 PM A		
	DE1700	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM)	5	15-Nov-21 08 AM A	19-Nov-21 04 PM A		
EST-FULL	DE1600	Create Planning Grade Estimate (+/-25% Full Funding)	5	22-Nov-21 08 AM A	29-Nov-21 04 PM A		
	PAFF2000	Submit Full Funding PAF for Internal Review	5	30-Nov-21 08 AM A	06-Dec-21 04 PM A		
	PAFF2200	Incorporate EPAC Full Funding PAF Review Comments	5	07-Dec-21 12 PM A	14-Dec-21 12 PM A		
PAF Submit	PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review	6	14-Dec-21 08 AM A	21-Dec-21 04 PM A		
PAF Submit	PAFF2105	EPAC for Meeting	0	22-Dec-21 12 PM A	22-Dec-21 12 PM A		
EPAC-F	FF1000	EPAC Full Funding Approval	6	03-Jan-22 08 AM*	10-Jan-22 12 PM	Eversource Project Approval	
PPA-FF	FF1010	Full Funding PowerPlan Approval	10	10-Jan-22 12 PM	25-Jan-22 12 PM	Eversource Project Approval	
80134682.01.12 T-Minus Milestones			230	07-Sep-21 12 AM A	08-Aug-22 08 AM		
80134682.01.12.1 T-Minus Milestones "A"Electrical			230	07-Sep-21 12 AM A	08-Aug-22 08 AM		
ENG-SCOPE	A1100	Eng. Project Scoping Document Issued (Scope Lockdown)	0		07-Sep-21 12 AM A		
	AT0801	ALL PERMITS RECEIVED	0		23-Nov-21 08 AM A		
ENG-PRELIM	A1090	Preliminary Design / Engineering Completed	0		11-Jan-22 04 PM		
	AT0404	ALL FINAL RELAY PROTECTIVE SETTING ISSUED	0		09-Feb-22 04 PM		
ENG-DTL	A3560	Detail Design/Engineering Completed	0		25-Feb-22 04 PM		
	AT2404	DETERMINE / ASSIGN LCE (LEAD COMMISSIONING ENGINEER)	0		03-Mar-22 04 PM		
	AT1202	P/C DESCRIPTION / DRAFT OPERATING INSTRUCTIONS ISSUED	0		17-Mar-22 04 PM		
	AT1301	COMMISSIONING PLAN COMPLETE	0		04-Apr-22 04 PM		



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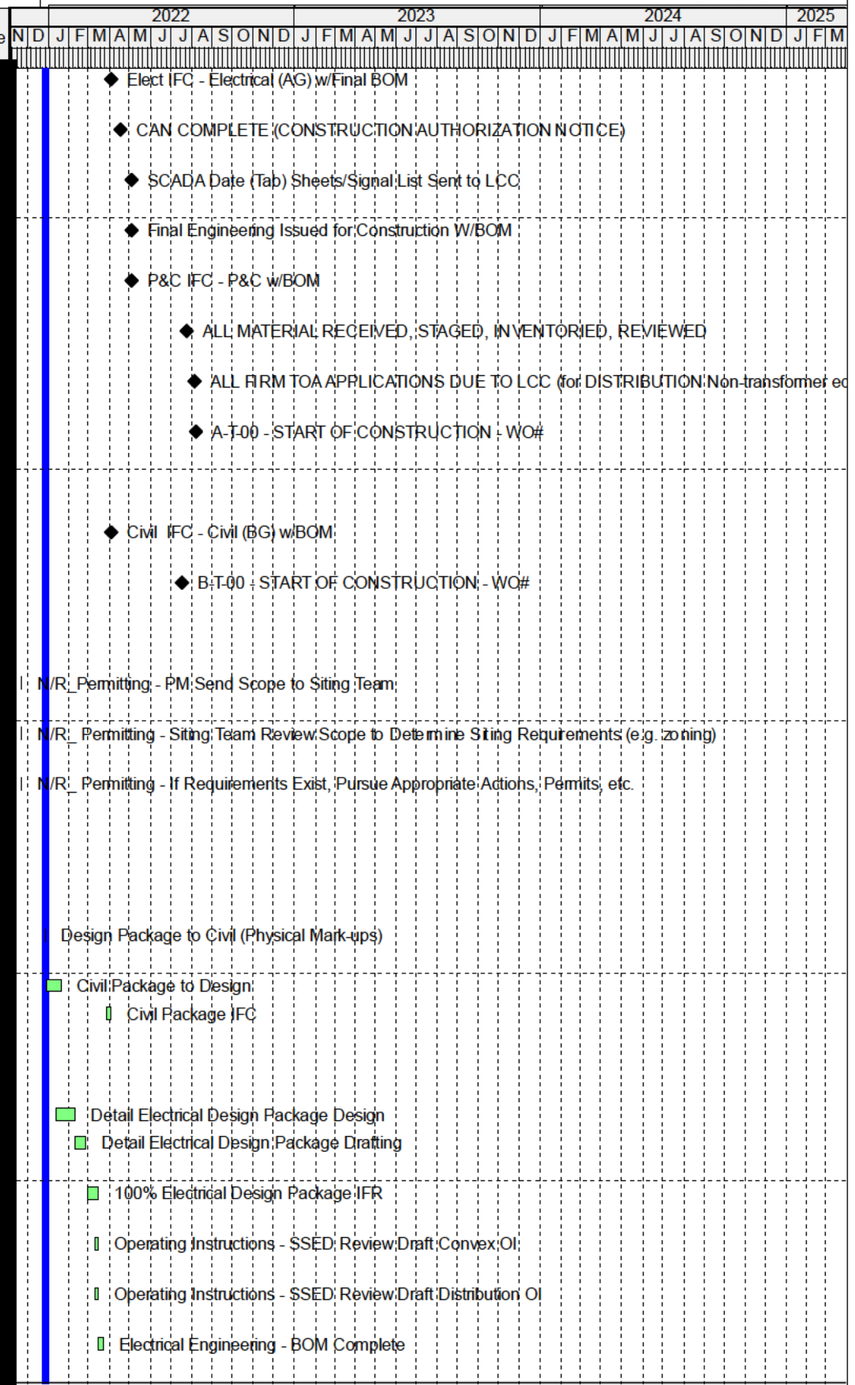
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
AG-IFC	AT0805E	Elect IFC - Electrical (AG) w/Final BOM	0		04-Apr-22 04 PM		
	AT0203	CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0		18-Apr-22 04 PM		
	AT1201	SCADA Date (Tab) Sheets/Signal List Sent to LCC	0		04-May-22 04 PM		
ENG-IFC	A3570	Final Engineering Issued for Construction W/BOM	0		04-May-22 04 PM		
BG-IFC	AT0805P	P&C IFC - P&C w/BOM	0		04-May-22 04 PM		
	AT0401	ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0		24-Jul-22 12 PM		
	AT0409	ALL FIRM TOA APPLICATIONS DUE TO LCC (for DISTRIBUTION Non-transformer equipment)	0		06-Aug-22 12 PM		
SOC	AT00	A-T-00 - START OF CONSTRUCTION - WO#	0	08-Aug-22 08 AM*			
80134682.01.12.2 T-Minus Milestones "B" Civil			104	04-Apr-22 04 PM	18-Jul-22 08 AM		
BG-IFC	BT0805C	Civil IFC - Civil (BG) w/BOM	0		04-Apr-22 04 PM		
SOC	BT00	B-T-00 - START OF CONSTRUCTION - WO#	0	18-Jul-22 08 AM*			
80134682.04 SITING APPROVALS AND PERMITS			1	22-Nov-21 08 AM A	22-Nov-21 04 PM A		
	A3590	N/R_Permitting - PM Send Scope to Siting Team	1	22-Nov-21 08 AM A	22-Nov-21 04 PM A		
	A3600	N/R_ Permitting - Siting Team Review Scope to Determine Siting Requirements (e.g. zoning)	1	22-Nov-21 08 AM A	22-Nov-21 04 PM A	Siting Lead Generic	
	A3610	N/R_ Permitting - If Requirements Exist, Pursue Appropriate Actions, Permits, etc.	1	22-Nov-21 08 AM A	22-Nov-21 04 PM A	Siting Lead Generic	
80134682.05 ENGINEERING & DESIGN			129	28-Oct-21 12 AM A	04-May-22 04 PM		
80134682.05.01 Civil Engineering			68	27-Dec-21 08 AM	04-Apr-22 04 PM		
	DSSE-100	Design Package to Civil (Physical Mark-ups)	1	27-Dec-21 08 AM	27-Dec-21 04 PM	Civil Engineer,	
	DSSE-110	Civil Package to Design	15	28-Dec-21 08 AM	19-Jan-22 04 PM	Civil Engir	
ES-IFC	DSSE-120	Civil Package IFC	5	29-Mar-22 08 AM	04-Apr-22 04 PM	Civil Engineer,	
80134682.05.02 Electrical Engineering			57	12-Jan-22 08 AM	04-Apr-22 04 PM		
	DSSE-200	Detail Electrical Design Package Design	19	12-Jan-22 08 AM	08-Feb-22 04 PM		
ES-DTL	DSSE-205	Detail Electrical Design Package Drafting	12	09-Feb-22 08 AM*	25-Feb-22 04 PM		
ES-100%	DSSE-210	100% Electrical Design Package IFR	12	28-Feb-22 08 AM	15-Mar-22 04 PM		
	DSSE-920	Operating Instructions - SSED Review Draft Convex OI	5	11-Mar-22 08 AM	17-Mar-22 04 PM		
	DSSE-460	Operating Instructions - SSED Review Draft Distribution OI	5	11-Mar-22 08 AM	17-Mar-22 04 PM		
	DSSE-230	Electrical Engineering - BOM Complete	5	16-Mar-22 08 AM	22-Mar-22 04 PM		



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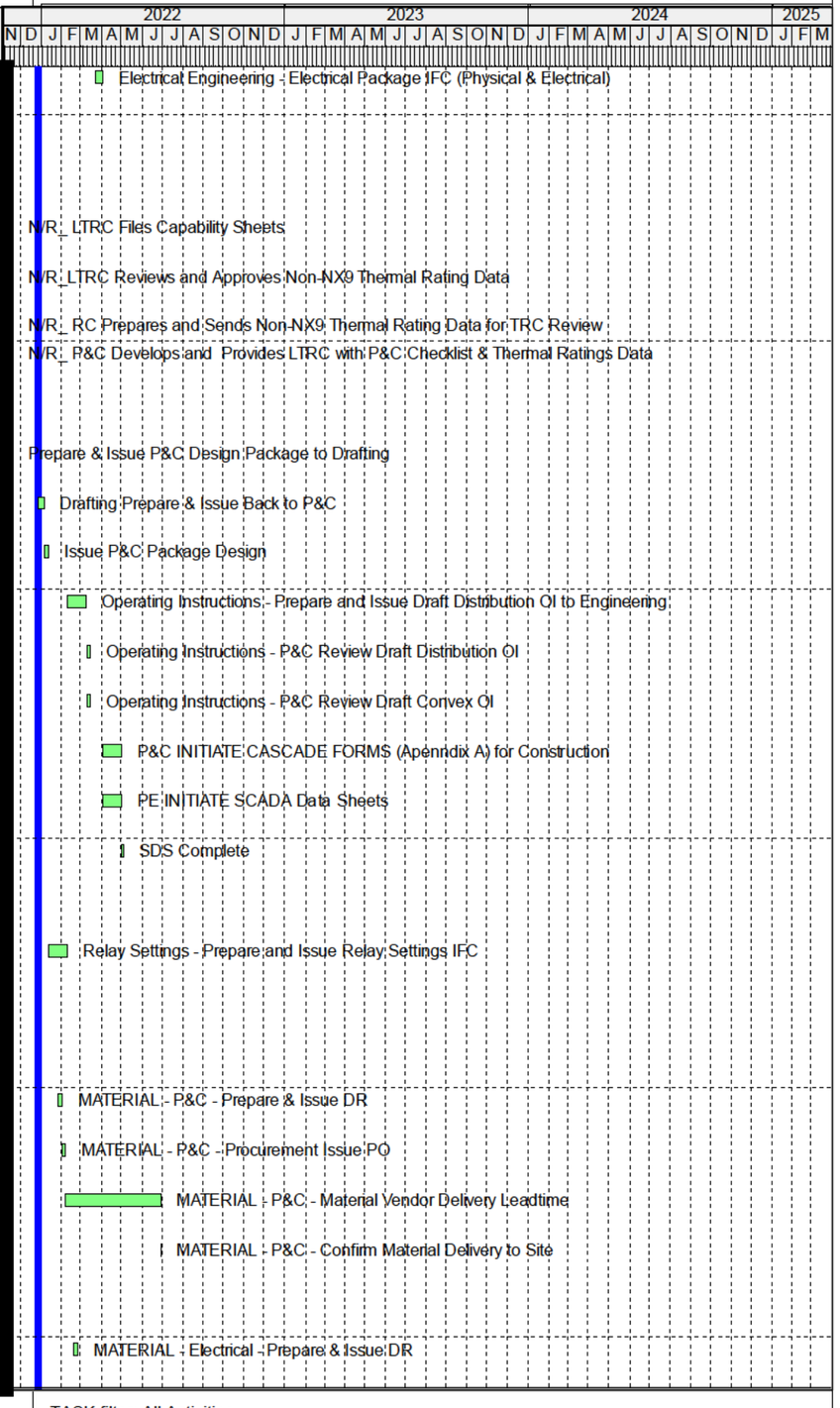
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
ES-IFC	DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	9	23-Mar-22 08 AM	04-Apr-22 04 PM		
80134682.05.03 Distribution Thermal Ratings NX-9			1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
80134682.05.03.05 Non NX-9 Thermal Ratings			1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
	NX9A-EM74	N/R_ LTRC Files Capability Sheets	1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
	NX9A-EM64	N/R_LTRC Reviews and Approves Non-NX9 Thermal Rating Data	1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
	NX9A-EM54	N/R_ RC Prepares and Sends Non-NX9 Thermal Rating Data for TRC Revi	1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
	NX9A-EM44	N/R_ P&C Develops and Provides LTRC with P&C Checklist & Thermal Ratings Data	1	18-Nov-21 08 AM A	18-Nov-21 04 PM A		
80134682.05.04 P&C Engineering			129	28-Oct-21 12 AM A	04-May-22 04 PM		
ES-CONCPT	DSSE-400	Prepare & Issue P&C Design Package to Drafting	15	28-Oct-21 12 AM A	19-Nov-21 12 AM A		
	DSSE-410	Drafting Prepare & Issue Back to P&C	6	27-Dec-21 08 AM	04-Jan-22 04 PM		
ES-PRELIM	A3380	Issue P&C Package Design	5	05-Jan-22 08 AM	11-Jan-22 04 PM		
	DSSE-450	Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	20	10-Feb-22 08 AM	10-Mar-22 04 PM		
	DSSE-470	Operating Instructions - P&C Review Draft Distribution OI	5	11-Mar-22 08 AM	17-Mar-22 04 PM		
	DSSE-930	Operating Instructions - P&C Review Draft Convex OI	5	11-Mar-22 08 AM	17-Mar-22 04 PM		
	DSSE-480	P&C INITIATE CASCADE FORMS (Apenndix A) for Construction	20	05-Apr-22 08 AM	02-May-22 04 PM		
	DSSE-990	PE INITIATE SCADA Data Sheets	20	05-Apr-22 08 AM	02-May-22 04 PM		
	DSSE-220	SDS Complete	2	03-May-22 08 AM	04-May-22 04 PM		
80134682.05.04.1 Relay Settings			20	12-Jan-22 08 AM	09-Feb-22 04 PM		
ES-RSET	DSSE-440	Relay Settings - Prepare and Issue Relay Settings IFC	20	12-Jan-22 08 AM	09-Feb-22 04 PM		
80134682.06 MATERIAL PROCUREMENT			173	15-Nov-21 08 AM A	24-Jul-22 12 PM		
80134682.06.01 MATERIAL FOR P&C			109	25-Jan-22 12 PM	29-Jun-22 12 PM		
DR-ENG	DSSE-510	MATERIAL - P&C - Prepare & Issue DR	5	25-Jan-22 12 PM	01-Feb-22 12 PM		
	DSSE-980	MATERIAL - P&C - Procurement Issue PO	5	01-Feb-22 12 PM	06-Feb-22 12 PM	Purchasing Departmen	
	DSSE-1000	MATERIAL - P&C - Material Vendor Delivery Leadtime	142	06-Feb-22 12 PM	28-Jun-22 12 PM	Purchasing Departmen	
M-DELIV	DSSE-1010	MATERIAL - P&C - Confirm Material Delivery to Site	1	28-Jun-22 12 PM	29-Jun-22 12 PM	Purchasing Departmen	
80134682.06.02 MATERIAL FOR ELECTRICAL			108	18-Feb-22 08 AM	24-Jul-22 12 PM		
DR-ENG	DSSE-520	MATERIAL - Electrical - Prepare & Issue DR	5	18-Feb-22 08 AM	25-Feb-22 04 PM		



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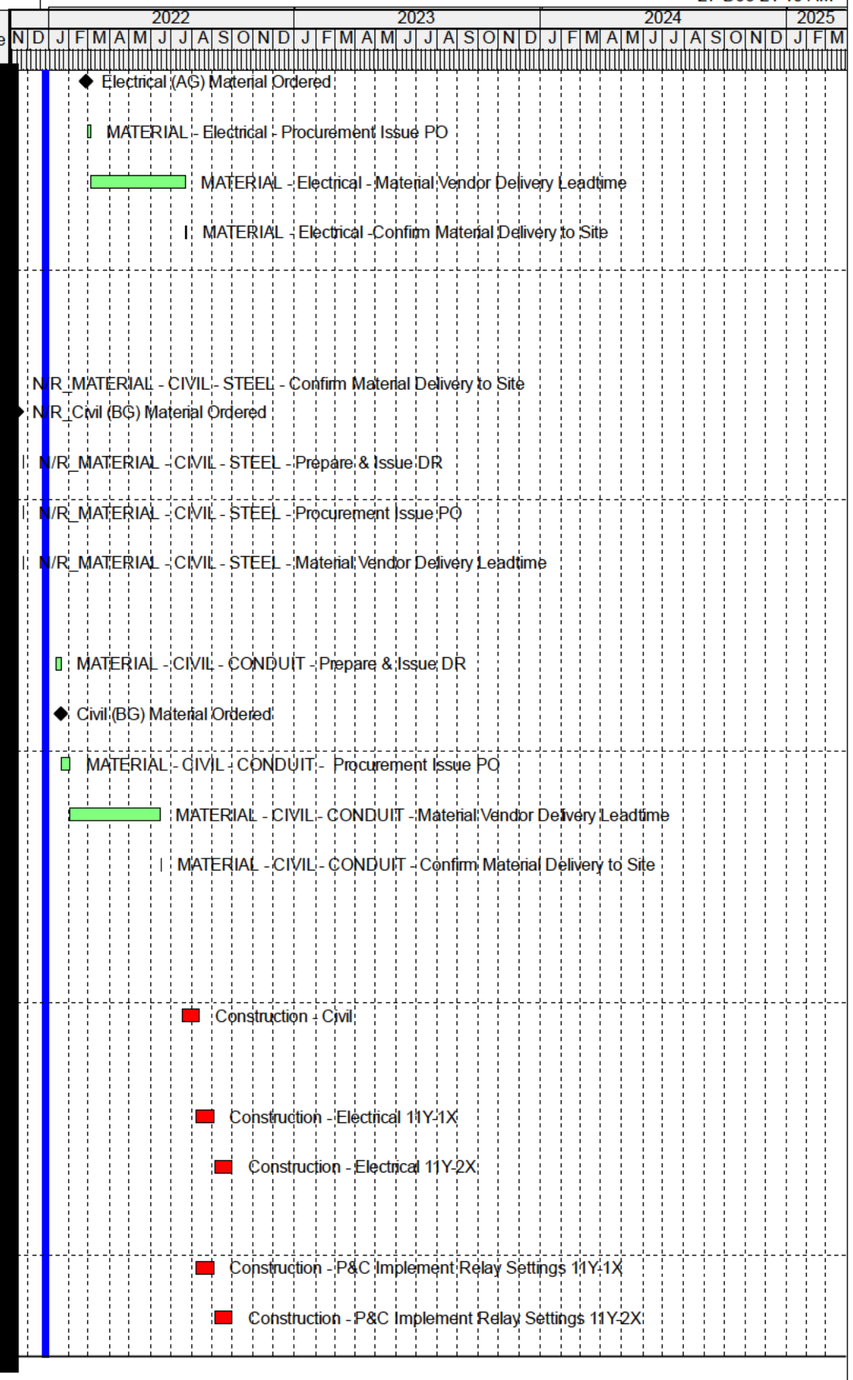
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
DR-AGMAT	DSSE-530	Electrical (AG) Material Ordered	0		25-Feb-22 04 PM		
	DSSE-1020	MATERIAL - Electrical - Procurement Issue PO	5	28-Feb-22 08 AM	04-Mar-22 04 PM	Purchasing Department	
	DSSE-1030	MATERIAL - Electrical - Material Vendor Delivery Leadtime	141	05-Mar-22 08 AM	23-Jul-22 12 PM	Purchasing Department	
M-DELIV	DSSE-550	MATERIAL - Electrical -Confirm Material Delivery to Site	1	23-Jul-22 12 PM	24-Jul-22 12 PM	Purchasing Department	
80134682.06.03 MATERIAL FOR CIVIL			149	15-Nov-21 08 AM A	17-Jun-22 04 PM		
80134682.06.03.01 MATERIAL FOR CIVIL - STEEL			8	15-Nov-21 08 AM A	24-Nov-21 12 PM A		
M-DELIV	DSSE-560	N/R_MATERIAL - CIVIL - STEEL - Confirm Material Delivery to Site	1	15-Nov-21 08 AM A	15-Nov-21 04 PM A	Purchasin	
DR-BGMAT	DSSE-540	N/R_Civil (BG) Material Ordered	0		15-Nov-21 08 AM A		
DR-ENG	DSSE-500	N/R_MATERIAL - CIVIL - STEEL - Prepare & Issue DR	1	23-Nov-21 12 PM A	24-Nov-21 12 PM A		
	DSSE-1040	N/R_MATERIAL - CIVIL - STEEL - Procurement Issue PO	1	23-Nov-21 12 PM A	24-Nov-21 12 PM A	Purchasing Department	
	DSSE-1050	N/R_MATERIAL - CIVIL - STEEL - Material Vendor Delivery Leadtime	1	23-Nov-21 12 PM A	24-Nov-21 12 PM A	Purchasing Department	
80134682.06.03.02 MATERIAL FOR CIVIL - CONDUIT			110	12-Jan-22 08 AM	17-Jun-22 04 PM		
DR-ENG	DSSE-1140	MATERIAL - CIVIL - CONDUIT - Prepare & Issue DR	5	12-Jan-22 08 AM	19-Jan-22 04 PM		
DR-BGMAT	DSSE-1170	Civil (BG) Material Ordered	0		19-Jan-22 04 PM		
	DSSE-1150	MATERIAL - CIVIL - CONDUIT - Procurement Issue PO	10	20-Jan-22 08 AM	02-Feb-22 04 PM	Purchasing Department	
	DSSE-1160	MATERIAL - CIVIL - CONDUIT - Material Vendor Delivery Leadtime	134	03-Feb-22 08 AM	16-Jun-22 04 PM	Purchasing Department	
M-DELIV	DSSE-1130	MATERIAL - CIVIL - CONDUIT - Confirm Material Delivery to Site	1	17-Jun-22 08 AM	17-Jun-22 04 PM	Purchasing Department	
80134682.07 CONSTRUCTION			64	18-Jul-22 08 AM	17-Oct-22 04 PM		
80134682.07.01 CONSTRUCTION - CIVIL			26	18-Jul-22 08 AM	12-Aug-22 04 PM		
	A1120	Construction - Civil	26	18-Jul-22 08 AM*	12-Aug-22 04 PM	Const Rep Field Sup -	
80134682.07.02 CONSTRUCTION - ELECTRICAL			54	08-Aug-22 08 AM	30-Sep-22 04 PM		
	A1130	Construction - Electrical [redacted]	26	08-Aug-22 08 AM*	02-Sep-22 04 PM	Const Rep Field Sup -	
	A1135	Construction - Electrical [redacted]	26	05-Sep-22 08 AM*	30-Sep-22 04 PM	Const Rep Field Sup -	
80134682.07.03 CONSTRUCTION - P&C			54	08-Aug-22 08 AM	30-Sep-22 04 PM		
	A1140	Construction - P&C Implement Relay Settings [redacted]	26	08-Aug-22 08 AM*	02-Sep-22 04 PM	Constructio Rep	
	A1145	Construction - P&C Implement Relay Settings [redacted]	26	05-Sep-22 08 AM*	30-Sep-22 04 PM	Constructio Rep	



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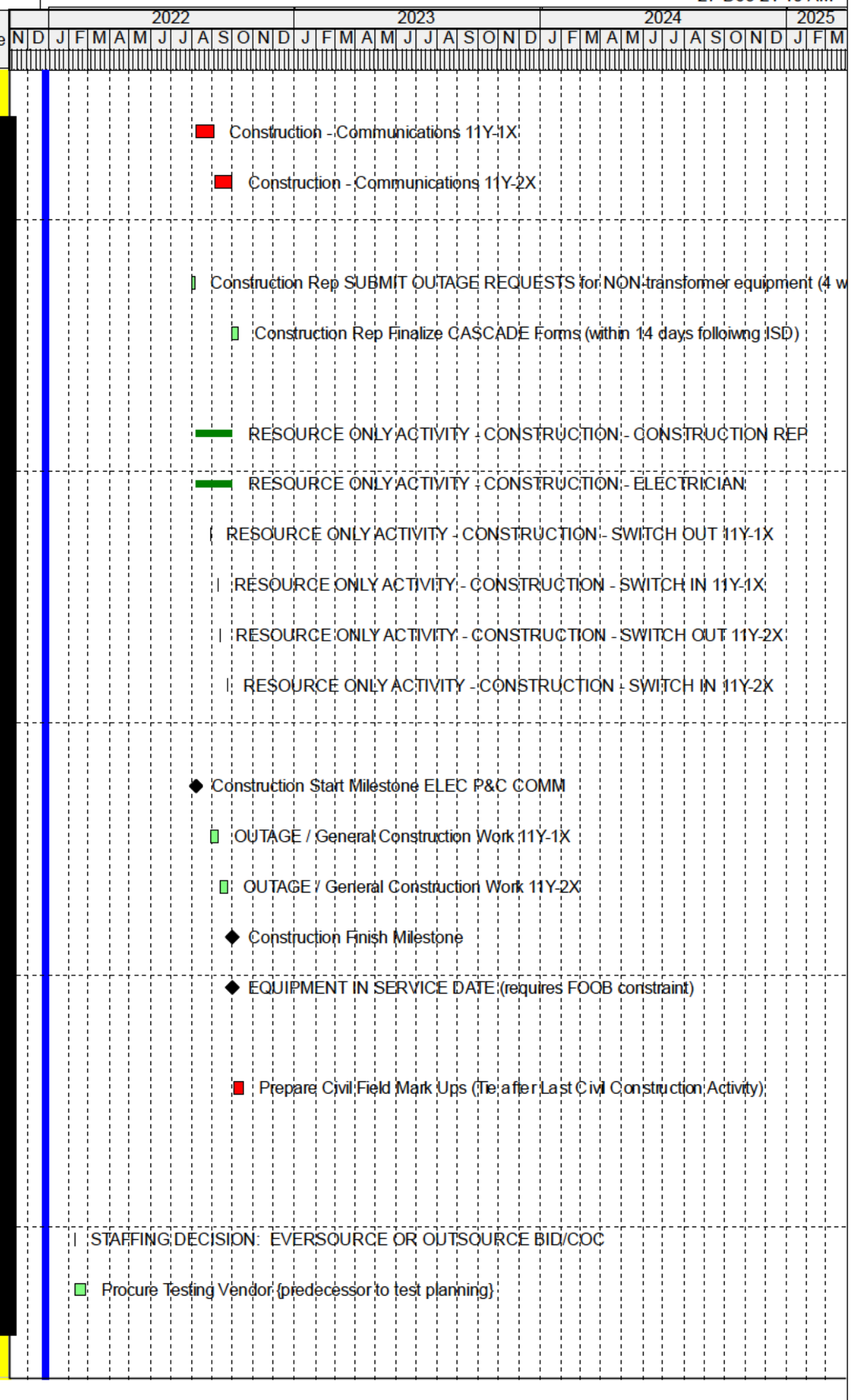
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
80134682.07.04 CONSTRUCTION - COMMUNICATIONS			54	08-Aug-22 08 AM	30-Sep-22 04 PM		
	A1150	Construction - Communications 11Y-1X	26	08-Aug-22 08 AM*	02-Sep-22 04 PM	Constructio Rep	
	A1155	Construction - Communications 11Y-2X	26	05-Sep-22 08 AM*	30-Sep-22 04 PM	Constructio Rep	
80134682.07.92 CONSTRUCTION - CONST.REP TASKS			71	01-Aug-22 12 PM	10-Oct-22 04 PM		
	A1250	Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before outage)	5	01-Aug-22 12 PM*	06-Aug-22 12 PM	Constructio Rep	
	A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10	01-Oct-22 08 AM*	10-Oct-22 04 PM	Constructio Rep	
80134682.07.94 CONSTRUCTION RESOURCE TRACKING			54	08-Aug-22 08 AM	30-Sep-22 04 PM		
	ConRep-S	RESOURCE ONLY ACTIVITY - CONSTRUCTION - CONSTRUCTION REP	54	08-Aug-22 08 AM	30-Sep-22 04 PM	Constructio Rep	
	CONSTelec	RESOURCE ONLY ACTIVITY - CONSTRUCTION - ELECTRICIAN	54	08-Aug-22 08 AM	30-Sep-22 04 PM	Distribution - S/S Electrician	
	A1070	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT [redacted]	1	29-Aug-22 08 AM	29-Aug-22 04 PM	Distribution Switching Crew	
	A1080	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN [redacted]	1	09-Sep-22 08 AM	09-Sep-22 04 PM	Distribution Switching Crew	
	A1075	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH OUT [redacted]	1	12-Sep-22 08 AM	12-Sep-22 04 PM	Distribution Switching Crew	
	A1085	RESOURCE ONLY ACTIVITY - CONSTRUCTION - SWITCH IN [redacted]	1	23-Sep-22 08 AM	23-Sep-22 04 PM	Distribution Switching Crew	
80134682.07.96 CONSTRUCTION OUTAGES			54	08-Aug-22 08 AM	30-Sep-22 04 PM		
CRH	CSM	Construction Start Milestone ELEC P&C COMM	0	08-Aug-22 08 AM*			
OUT	TOA-Const 11Y-1X	OUTAGE / General Construction Work [redacted]	12	29-Aug-22 08 AM*	09-Sep-22 04 PM	Constructio Resources	
OUT	TOA-Const5 11Y-2X	OUTAGE / General Construction Work	12	12-Sep-22 08 AM*	23-Sep-22 04 PM	Constructio Resources	
	CFM	Construction Finish Milestone	0		30-Sep-22 04 PM*		
ISD	ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0		30-Sep-22 04 PM*		
80134682.07.98 CONSTRUCTION CLOSEOUT			10	03-Oct-22 08 AM	17-Oct-22 04 PM		
	DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	10	03-Oct-22 08 AM	17-Oct-22 04 PM	Constructio Resources	
80134682.09 TEST AND COMMISSION			90	09-Feb-22 08 AM	16-Jun-22 04 PM		
80134682.09.01 TEST - SERVICES STAFFING DECISION			11	09-Feb-22 08 AM	24-Feb-22 04 PM		
	A1010	STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/COC	1	09-Feb-22 08 AM	09-Feb-22 04 PM		
	A3250	Procure Testing Vendor (predecessor to test planning)	10	10-Feb-22 08 AM	24-Feb-22 04 PM		
80134682.09.02 LCE PLANNING			47	28-Feb-22 08 AM	03-May-22 04 PM		



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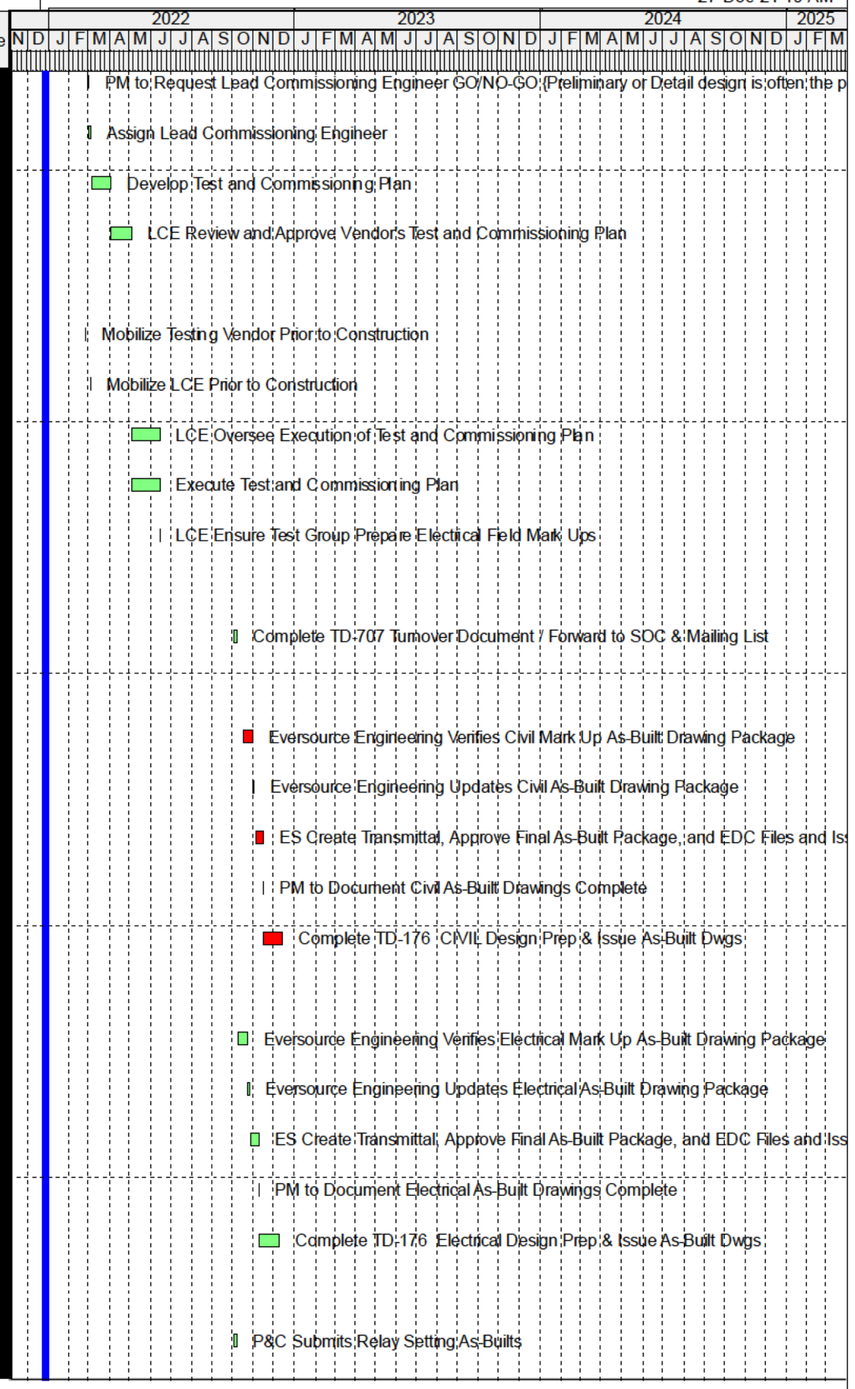
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
	LCE100	PM to Request Lead Commissioning Engineer GO/NO-GO {Preliminary or Detail design is often the predecessor}	2	28-Feb-22 08 AM	01-Mar-22 04 PM		
	LCE200	Assign Lead Commissioning Engineer	2	02-Mar-22 08 AM	03-Mar-22 04 PM		
	LCE400	Develop Test and Commissioning Plan	21	07-Mar-22 08 AM	04-Apr-22 04 PM	CT/WMA Test	
	LCE500	LCE Review and Approve Vendor's Test and Commissioning Plan	21	05-Apr-22 08 AM	03-May-22 04 PM	CT - Lead Commissior	
80134682.09.04 TEST ACTIVITIES			79	25-Feb-22 08 AM	16-Jun-22 04 PM		
	LCE320	Mobilize Testing Vendor Prior to Construction	2	25-Feb-22 08 AM	26-Feb-22 04 PM	CT/WMA Test	
	LCE310	Mobilize LCE Prior to Construction	2	04-Mar-22 08 AM	05-Mar-22 04 PM	CT - Lead Commissior	
	LCE610	LCE Oversee Execution of Test and Commissioning Plan	30	04-May-22 08 AM	15-Jun-22 04 PM	CT - Lead Commissior	
	LCE620	Execute Test and Commissioning Plan	30	04-May-22 08 AM	15-Jun-22 04 PM	Engineering Contractor	
	LCE700	LCE Ensure Test Group Prepare Electrical Field Mark Ups	1	16-Jun-22 08 AM	16-Jun-22 04 PM	CT - Lead Commissior	
80134682.10 PROJECT CLOSE OUT			51	03-Oct-22 08 AM	15-Dec-22 04 PM		
	DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5	03-Oct-22 08 AM	07-Oct-22 04 PM	Constructio Rep	
80134682.10.01 Civil As-Builts			41	18-Oct-22 08 AM	15-Dec-22 04 PM		
	DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	10	18-Oct-22 08 AM	31-Oct-22 04 PM		
	DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	3	01-Nov-22 08 AM	03-Nov-22 04 PM		
ES-ASB	DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	8	04-Nov-22 08 AM	16-Nov-22 04 PM		
	DSSE-880	PM to Document Civil As-Built Drawings Complete	1	17-Nov-22 08 AM	17-Nov-22 04 PM		
	DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	20	17-Nov-22 08 AM	15-Dec-22 04 PM		
80134682.10.02 Electrical As-Builts			42	11-Oct-22 08 AM	09-Dec-22 04 PM		
	DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	10	11-Oct-22 08 AM	24-Oct-22 04 PM		
	DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	3	25-Oct-22 08 AM	27-Oct-22 04 PM		
ES-ASB	DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	9	28-Oct-22 08 AM	09-Nov-22 04 PM		
	DSSE-840	PM to Document Electrical As-Built Drawings Complete	1	10-Nov-22 08 AM	10-Nov-22 04 PM		
	DSSE-1110	Complete TD-176 Electrical Design Prep & Issue As-Built Dwgs	20	10-Nov-22 08 AM	09-Dec-22 04 PM		
80134682.10.03 P&C As-Builts			10	03-Oct-22 08 AM	17-Oct-22 04 PM		
	DSSE-960	P&C Submits Relay Setting As-Builts	5	03-Oct-22 08 AM	07-Oct-22 04 PM		



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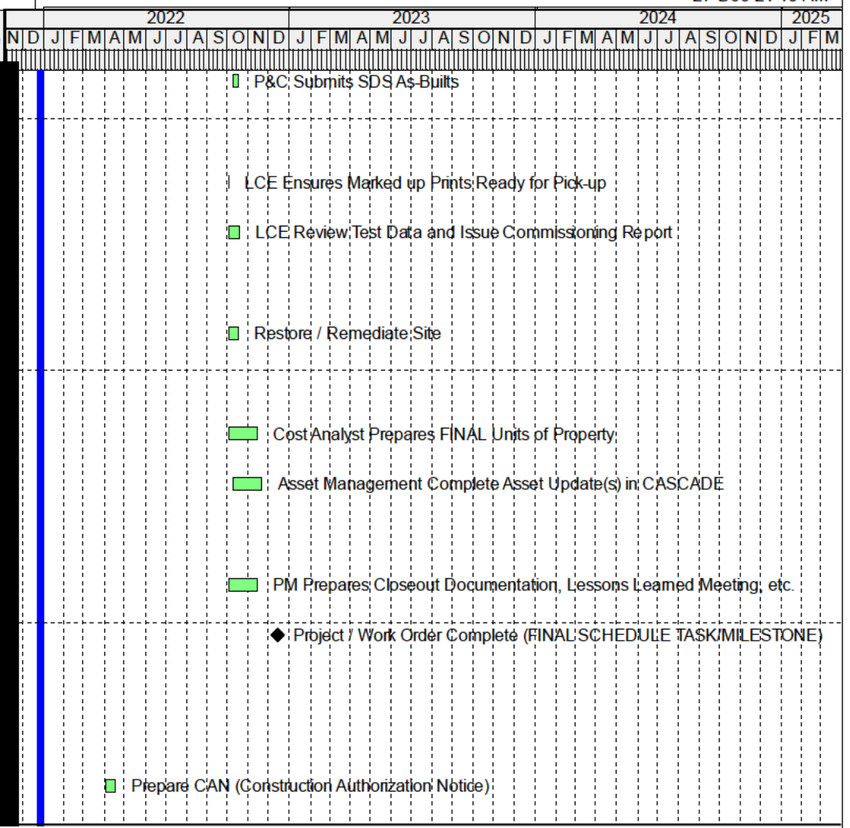
Activity Flag	Activity ID	Activity Name	At pletion	Start	Finish	Resources	Activity Schedule
	DSSE-950	P&C Submits SDS As-Builts	5	11-Oct-22 08 AM	17-Oct-22 04 PM		
80134682.10.04 Test Closout			11	03-Oct-22 08 AM	18-Oct-22 04 PM		
	LCE800	LCE Ensures Marked up Prints Ready for Pick-up	1	03-Oct-22 08 AM	03-Oct-22 04 PM	CT - Lead Commissio Engineer	
	LCE900	LCE Review Test Data and Issue Commissioning Report	10	04-Oct-22 08 AM	18-Oct-22 04 PM	CT - Lead Commissio Engineer	
80134682.10.05 SITE RESTORATION CLOSEOUT			10	03-Oct-22 08 AM	17-Oct-22 04 PM		
	A1110	Restore / Remediate Site	10	03-Oct-22 08 AM	17-Oct-22 04 PM	CT/WMA.C Contractor-	
80134682.10.06 MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT			35	03-Oct-22 08 AM	22-Nov-22 04 PM		
	A1020	Cost Analyst Prepares FINAL Units of Property	30	03-Oct-22 08 AM	15-Nov-22 04 PM	CT- Cost Analyst	
	A1030	Asset Management Complete Asset Update(s) in CASCADE	30	11-Oct-22 08 AM	22-Nov-22 04 PM		
80134682.10.07 PROJECT MANAGEMENT CLOSEOUT			51	03-Oct-22 08 AM	15-Dec-22 04 PM		
	A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30	03-Oct-22 08 AM	15-Nov-22 04 PM		
	FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0		15-Dec-22 04 PM		
80134682.13 OVERHEAD / INDIRECTS			10	05-Apr-22 08 AM	18-Apr-22 04 PM		
80134682.13.01 PROJECT MANAGEMENT			10	05-Apr-22 08 AM	18-Apr-22 04 PM		
	A1170	Prepare CAN (Construction Authorization Notice)	10	05-Apr-22 08 AM	18-Apr-22 04 PM		



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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): CS00522	**Project Constructability Phase:**	
Date(s) of Constructability Review: **10/08/2021**	☒ Conceptual Engineering Design	
Click to enter a date	☐ Preliminary Engineering Design	
	☐ Detailed Engineering Design	
Project Scope Statement: [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	[redacted]	☐	☐	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] _____*10/8/21*_____*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	New Controls required	Engineering to order new controls
2	New conduit to manhole needed	Eng to check spare conduits from manhole to control house
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

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
2	**Materials Identified/Ordered** -Any concerns with BOM/Major Materials? Review BOM lead times and project need dates -Specialty Major Materials: Identify Specialty Equipment & Materials potentials - temporary/replacement - long lead items? -Any Materials needed to facilitate construction access?		Material to be ordered upon Full Funding approval 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?		Eng to check spare conduits from manhole to control house for space

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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.)		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

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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

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
6	**Outage & Energization Plan and Construction Sequence:** *Review electrical working clearances for equipment during construction, Detailed look at protection zone changes, Locked sequence or random outages, Outage durations minimized.* ***Considerations:*** -Approach Distances – Outage Requirements to maintain electrical clearances throughout proposed installation -Distribution Clearances -Clearance Holder Assignments -Drawings vs Field Conditions -Outage boundaries and interconnections -Phased approach needs for additional mobilizations -Verify outage sequence supports the planned construction sequence and timeline. (Lead Commissioning Engineer "LCE", Substation Operations, and Outage Planner input) -Any design alterations or considerations to Eliminate SCLL Conditions, Reduce Recall Time, Reduce Outage durations, Special Conditions -Additional outage requirements: Railroad Catenaries, Fiber outage, SCADA outage, Relay permissions -Seasonal or weather conditions impacts	☐	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

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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

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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 [redacted]

[redacted]

[redacted] The list of substations and associated LTC transformers is provided in Attachment 1. [redacted]

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]



- 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:

1. [redacted]

   Cost estimate $554,100 (planning grade)

2. [redacted]

3. [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]			
TOTAL UNITS		9	

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Planned LTC Releases for 2022

Substation Name	Project Number	LTC Control	Equip Position
[redacted]			

Planned LTC Releases for 2023

Substation Name	Project Number	LTC Control	Equip Position
[redacted]			
TOTAL UNITS		8	

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

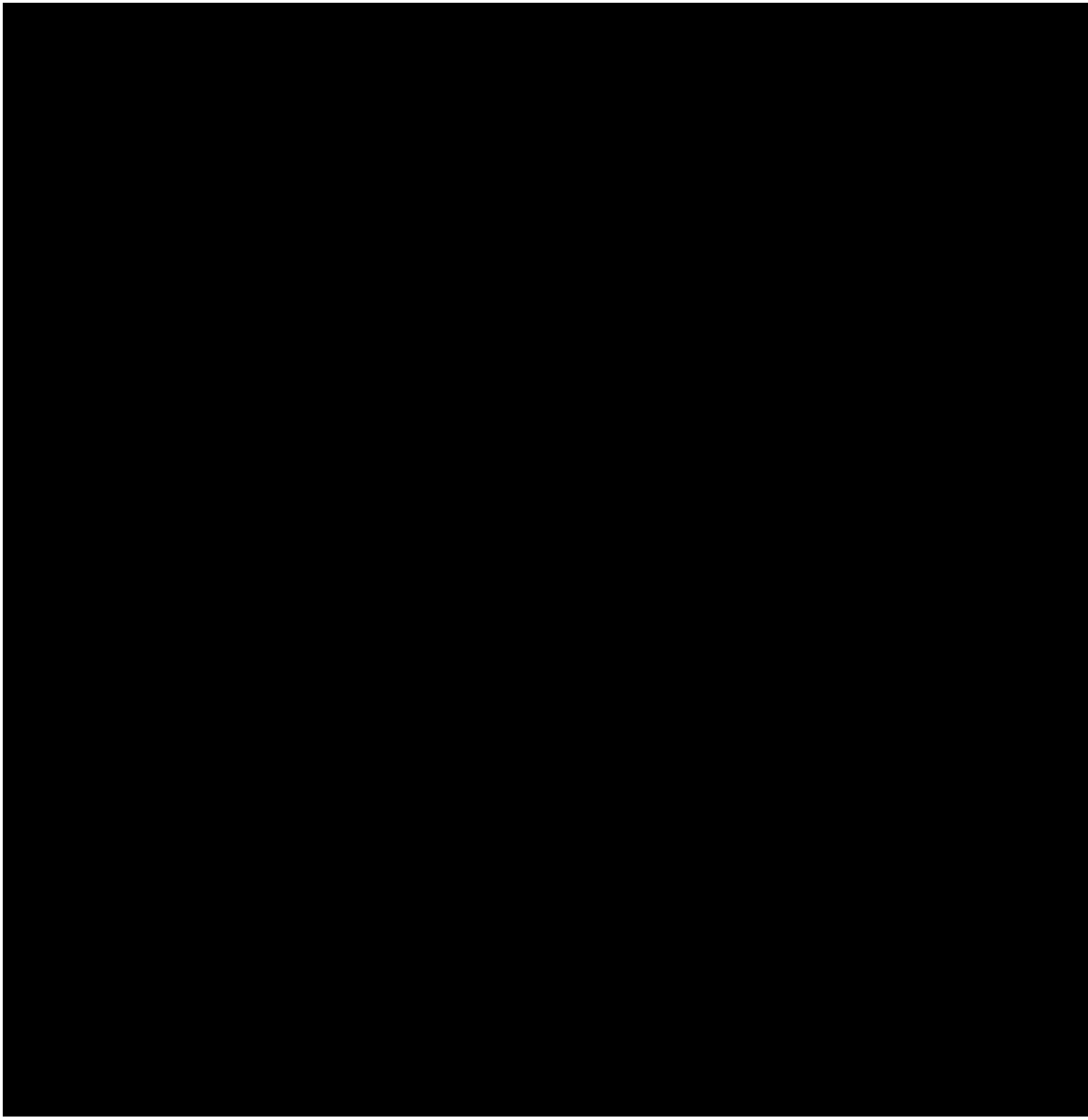
Check AFUDC rate minor drop in CT D rate.

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.

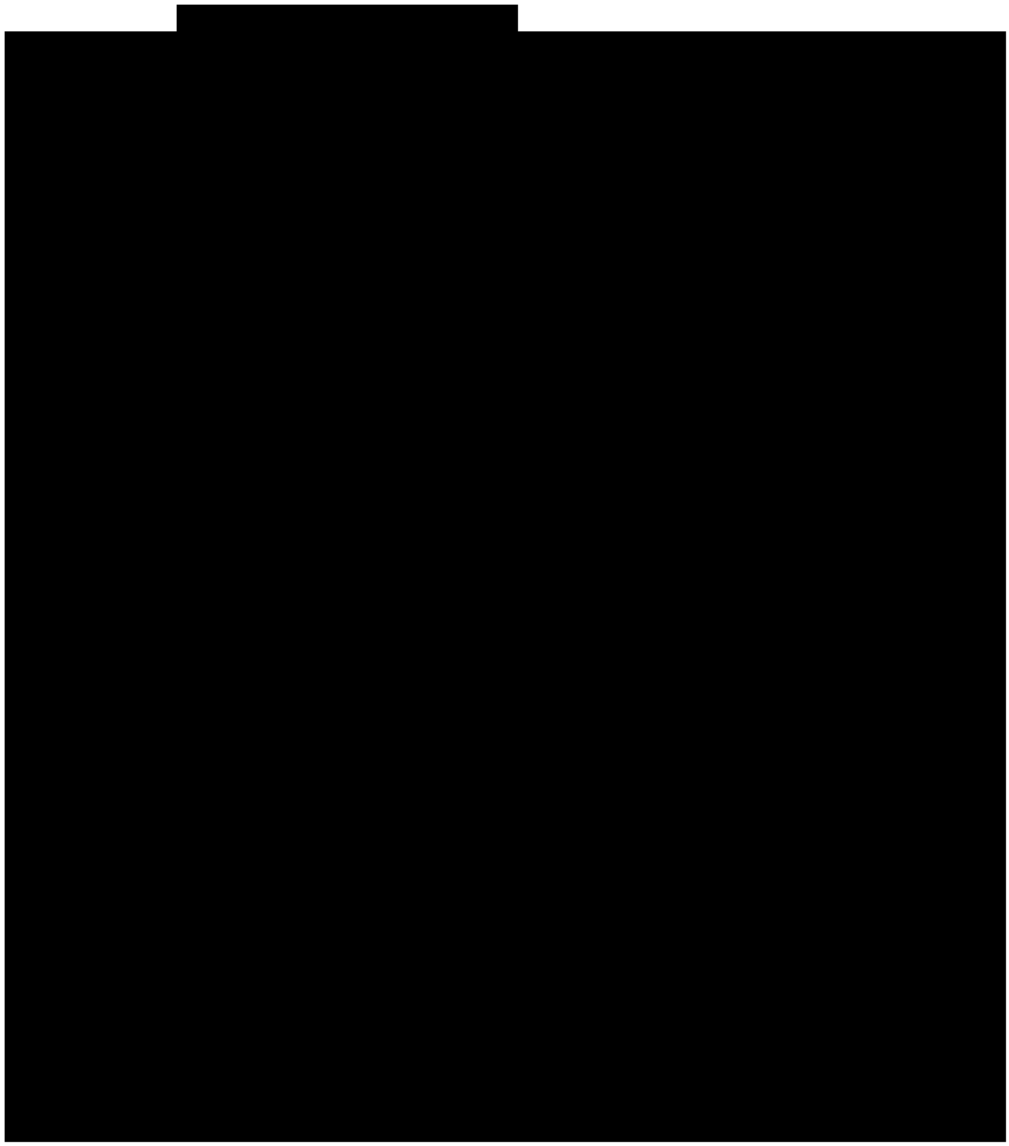
Attachment 2 – Substation – Transformer List



ATTACHMENT 3 - Photos

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





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

[redacted]