EVERSOURCE

Operations Project Authorization Form

Approved at September 30, 2020 EPAC
Link to Meeting Minutes

Date Prepared: 11/02/2020	**Project Title: [redacted] OCB Replacement Phase 1**
Company: Eversource CT	**Project Number: CS00394**
Organization: Asset Management	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Circuit Breakers**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Project Purpose: Replace obsolete equipment to increase reliability**
Estimated in service date: 12/31/2020	**Capital Investment part of original Oper. Plan: Yes**
Eng./Constr. Resources Budgeted? Yes	**O&M Expenses part of original Oper. Plan: N/A**
Authorization Type: Full Funding	**Facility Type** (check all that apply)**:**
Total Request: $1.101M	☐ PTF ☐ non-PTF ☒ Distribution

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This project is seeking full funding of $1.101M to replace [redacted] The substation has been identified as requiring complete rehabilitation to replace the substation's aging equipment over the upcoming years. This project is the first of three (3) phases and is scheduled to be completed by March 2021. [redacted] being replaced under this phase are shown on Diagram 2.

This project is associated with the following projects (See attached Diagram 1):

- CS00395 [redacted]
- CS00245 [redacted]
- 201438 [redacted]

The work to replace [redacted] was originally under project CS00245 and the work for the [redacted] was under project 201438. The decision to divide the work into three (3) new projects was based on breaking down the

work into three (3) different areas of the substation to coordinate outages. See Diagram 1 showing the area of the substation for each of the project phases.

The work for the replacement of the [redacted]. CS00245 was approved for $801,565 in PowerPlan on June 8, 2017. 201438 was approved for $127,300 in PowerPlan on July 14, 2017. Prior actual costs from WO # CS002451 OCB $362K and WO# 20143801 Bus Rehab $102K will be transferred to this project. These values reflect the September 9, 2020 actual values from PowerPlan. To date, engineering has been completed and construction is in progress.

Eversource CT has a Public Utilities Regulatory Authority (PURA) initiative within docket number 14-05-06 to replace all OCBs at distribution substations to minimize environmental impacts from leaking and failed equipment. [redacted]

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Project Costs Summary

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2020 to Go	2021	2022	2023	2024	2025	Total
1. ROW / Easements / Land purchases		$0	$0	$0	$0	$0	$0	$0	$0
2. Environmental Approvals / Permits		$0	$0	$0	$0	$0	$0	$0	$0
3. Outreach		$0	$0	$0	$0	$0	$0	$0	$0
4. Siting Approvals / Permits		$0	$0	$0	$0	$0	$0	$0	$0
5. Engineering / Design		$34	$31	$4	$0	$0	$0	$0	$70
6. Materials (Eversource purchased)		$99	$1	$0	$0	$0	$0	$0	$100
7. Construction (incl matl's by contractors)		$51	$107	$0	$0	$0	$0	$0	$158
8. Testing / Commissioning		$0	$82	$0	$0	$0	$0	$0	$82
9. PMT Project Mgmt Team		$0	$26	$1	$0	$0	$0	$0	$26
10. Removals		$0	$12	$0	$0	$0	$0	$0	$12
11. Other		$1	$0	$0	$0	$0	$0	$0	$1
12. Risks		$0	$50	$0	$0	$0	$0	$0	$50
Project Directs Total w/Risks	**$0**	**$185**	**$309**	**$5**	**$0**	**$0**	**$0**	**$0**	**$499**
13. Indirects/Overhead		$92	$464	$9	$0	$0	$0	$0	$565
14. AFUDC		$1	$11	$0	$0	$0	$0	$0	$12
Project Total - Baseline Budget	**$0**	**$278**	**$784**	**$14**	**$0**	**$0**	**$0**	**$0**	**$1,076**
15. Contingency		$0	$24	$0	$0	$0	$0	$0	$25
Project Total - Funding Approval Level	**$0**	**$278**	**$808**	**$15**	**$0**	**$0**	**$0**	**$0**	**$1,101**
16. Reimbursables/Customer Contribution		$0	$0	$0	$0	$0	$0	$0	$0
Project Total (less reimbursables)	**$0**	**$278**	**$808**	**$15**	**$0**	**$0**	**$0**	**$0**	**$1,101**
Total O&M	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
TOTAL REQUEST	**$0**	**$278**	**$808**	**$15**	**$0**	**$0**	**$0**	**$0**	**$1,101**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*
Note: Actuals for WO# CS00245 are taken from PowerPlan 10/02/2020 and costs used for Phase 1 are included here.

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Risk Costs

Note: Dollar values are in thousands

Risk Cost Breakdown	
New breaker control cables, Supply and Install	$100
Severe Weather, Delays, OT	$25
Overtime Required Due to Lack of available labor	$25
Risk Total	$150

Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2020 to Go	2021	2022	2023	2024	2025	Total
ST Labor	$0	$17	$185	$2	$0	$0	$0	$0	$205
OT Labor	$0	$0	$0	$0	$0	$0	$0	$0	$0
Outside services - Labor	$0	$68	$47	$3	$0	$0	$0	$0	$118
Materials (All materials incl. outside service purchased which is shown in constr. above)	$0	$99	$1	$0	$0	$0	$0	$0	$100
Removals	$0	$0	$12	$0	$0	$0	$0	$0	$12
Other	$0	$1	$88	$1	$0	$0	$0	$0	$89
Indirects	$0	$92	$464	$9	$0	$0	$0	$0	$565
AFUDC	$0	$1	$11	$0	$0	$0	$0	$0	$12
TOTAL CAPITAL REQUEST - without Reimbursables	**$0**	**$278**	**$808**	**$15**	**$0**	**$0**	**$0**	**$0**	**$1,101**

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

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

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

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

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

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

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

Asset Retirement Obligation (ARO) and/ or Environmental Cleanup Costs (Environmental Liabilities):

Is there an ARO associated with this project? If yes, please provide details:
No

Are there other environmental cleanup costs associated with this project? If yes, please provide details: Yes

Expected environmental cleanup costs have been accounted for within the requested project cost. The cleanup costs include the drainage, removal and disposal of the oil from the existing circuit breakers.

Technical Justification:

Project Need Statement

The [redacted] as part of this project. See Diagram 3 for a photo of [redacted] nd as part of a past Public Utilities Regulatory Authority (PURA) initiative within docket number 14-05-06.

Manufacturer support and replacement parts are difficult to obtain for these three (3) OCBs. Many of the required repair parts for these aging breakers are unavailable. Eversource CT previously submitted a PURA initiative within docket number 14-05-06 to replace all OCBs at distribution substations to minimize environmental impacts from possible leaking and failed equipment.

[redacted]

Project Objectives

[redacted] is expected to be in service by December 2020 and completion by Q1 2021.

Project Scope

The scope includes the following:

[redacted]

- Provide animal protection.
- Test and commission the new equipment.
- Proper disposal of oil and removed equipment.

Table 1 - Equipment to be replaced/removed

[redacted]

[redacted] have been purchased and are being installed. The following [redacted] has not been purchased. They will be covered under the phase two project, CS00395, to allow for purchase of the equipment to not hold up the completion of phase one.

[redacted]

A constructability review was completed on July 8, 2020. See Attachment B for the completed form.

Background / Justification

The equipment replacements are needed to enhance the reliability and availability of the [redacted]

The overall Eversource initiative to eliminate oil filled circuit breakers was presented to PURA within docket number 14-05-06. This initiative was created to decrease Eversource's environmental exposure to oil spills and leaks as well as replace a vital component of aging substation infrastructure. The initiative started by targeting OCBs with PCB bushings. In 2012, the initiative increased in scope to include all substation OCBs. The initial justification was based on the anticipated risk of potential environmental damage in case of a PCB bushing/breaker catastrophic failure.

[redacted]

Business Process and / or Technical Improvements

The equipment improvements to this substation yard will look to minimize future exposure to prolonged customer outages during emergency and routine switching operations and reduced environmental risk. This project will increase system reliability by replacing the obsolete equipment identified above.

The environmental benefit will be realized by replacing aging oil filled equipment, which presents an environmental concern.

Alternatives Considered with Cost Estimates

Alternative 1. [redacted]

[redacted] with an in-service date of December 2020. See Attachment A for the alternative 1 Cost Estimate.

Alternative 2. [redacted]

[redacted]. This is still the chosen alternative and final goal for the substation but to begin the replacement process efficiently, the work has been divided into three (3) phases to coordinate construction, procurement and scheduling activities.

Alternative 3. [redacted]

[redacted]

The cost for this alternative could be as high as $40 to $50K per breaker. This alternative does not address the PURA initiative and was not chosen.

Alternative 4. Do Nothing

An alternative to the identified project scope is to do nothing. [redacted] This does not address the PURA initiative and was not chosen.

Project Schedule

Milestone/Phase Name	Estimated Date
Presentation and Approval at EPAC	September 2020
100% Engineering Completion	September 2020
Construction Start	September 2020
Testing/Commissioning	Dec 2020
In Service Date	Dec 2020
Project Close Out	March 2021

See Attachment C for the P6 schedule.

Regulatory Approvals

N/A

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Existing OCB cables are damaged and will require replacement.	2020	Low Impact	Meggar test cables during construction/commissioning and replace in existing conduit. During the site walk-down, visible cables appeared to be in good condition. $25K
Weather Delays	2020	Medium Impact	Add allowance of $25K

Contingency

A Contingency has been included to cover possible cost deviations on the following items:

- Engineering / Design - $3K
- Construction (including materials by Contractors – $11K
- Testing/Commissioning - $8K
- Project Management Team – $1K (4%)
- Removal of Equipment - $1K

References

CL&P 2014 Operating Initiatives - Docket No.14-05-06 PURA-03 Dated 06/20/2014

PURA initiative within docket number 14-05-06

Eversource Substation standards SUB 018

Attachments (One-Line Diagrams, Images, etc.)

- Diagram 1 - Nomenclature diagram indicating associated projects.
- Diagram 2 – Area of nomenclature diagram 16411-91001 indicating equipment to be replaced
- Diagram 3 – Photo of [redacted]o be replaced
- Attachment A - Backup Cost Estimate
- Attachment B - Constructability Review Form
- Attachment C - P6 Schedule

Diagram 1 - Nomenclature diagram indicating associated projects.



See Diagram 2 for Details

Diagram 2 – Area of nomenclature diagram 16411-91001 indicating equipment to be replaced

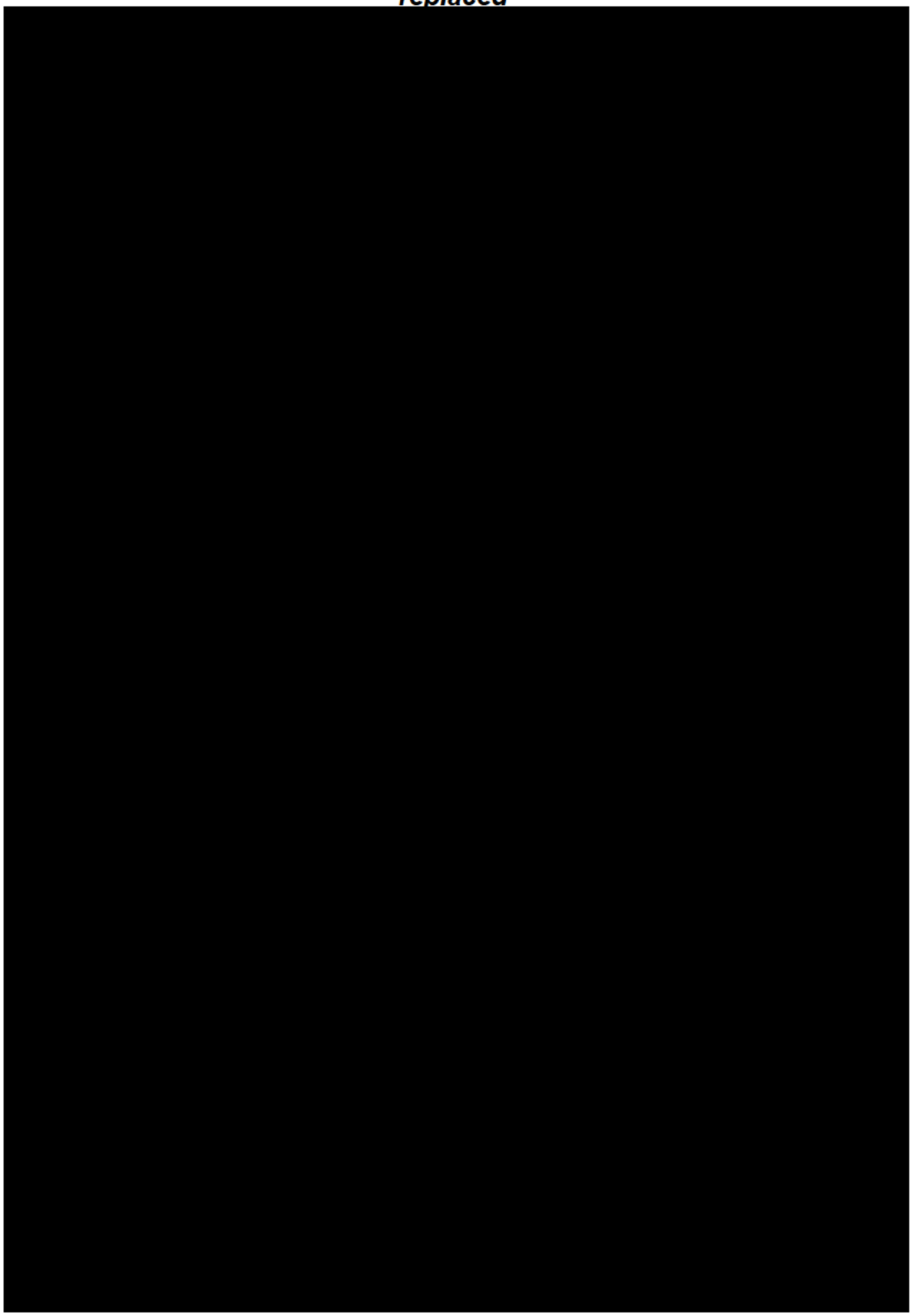

Diagram 3 – Photo of oil circuit breaker [redacted] be replaced



Project Checklist - Transmission & Substation Capital Project						
Project Name: [redacted] **OCB Replacement Phase 1**					**Project Number: CS00394**	
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):					N/A	
Cost in ISO-NE Presentation ($M) (if completed):					N/A	
Is a PPA required?					No	
Is a TCA Application Required?					No	
TCA Submittal Date (if submitted):					N/A	
Cost in TCA Submittal ($M) (if submitted):					N/A	
Enter ISO-NE RSP / Asset Condition ID, if assigned:					N/A	
PLANNING/PROTECTION & CONTROLS						
Are RAS/SPS/UVLs affected?					No	
OPERATIONS						
Outage Required?	☒ Primary Equipment (Power Transfer)	☒ Secondary Equipment (P&C only)	☐ Outage Not Required			
Do SCLL Conditions Exist?					No	
Has an outage schedule been approved?					Yes	
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?					Yes	
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	

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] OCB Replacement Phase 1	**Project Number: CS00394**
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 ([redacted])

Cost Estimate Backup Details

See Attachment A for the detailed cost estimate backup file.

ESTIMATE SUMMARY

Project Title:OCB Replacement and Bus Rehab
Project Mgr/Lead [redacted]
Project Number:CS00394
WO & Task #:CS003941
Est. Revision # 5

Estimate By: [redacted]
Date of Estimate:10/06/20
ISD:12/31/2020
Estimate #

Template Revision # 01.4

ESTIMATE SUMMARY

Estimate Type: Planning

WBS	Description	TOTAL	% of Total	Priors	2020	2021	2022	2023	2024	2025
1	ROW / Easements / Land purchases	$0	0.0%	$0	$0	$0	$0	$0	$0	$0
2	Environmental Approvals / Permits	$0	0.0%	$0	$0	$0	$0	$0	$0	$0
3	Outreach	$0	0.0%	$0	$0	$0	$0	$0	$0	$0
4	Siting Approvals / Permits	$0	0.0%	$0	$0	$0	$0	$0	$0	$0
5	Engineering / Design	$69,700	6.3%	$34,000	$31,400	$4,300	$0	$0	$0	$0
6	Materials (Eversource purchased)	$100,200	9.1%	$99,400	$800	$0	$0	$0	$0	$0
7	Construction (incl matl's by	$157,800	14.3%	$50,800	$107,000	$0	$0	$0	$0	$0
8	Testing / Commissioning	$81,600	7.4%	$0	$81,600	$0	$0	$0	$0	$0
9	PMT Project Mgmt Team	$26,500	2.4%	$0	$25,700	$800	$0	$0	$0	$0
10	Removals	$12,500	1.1%	$0	$12,500	$0	$0	$0	$0	$0
11	Other	$1,000	0.1%	$1,000	$0	$0	$0	$0	$0	$0
12	Risks	$50,000	4.5%	$0	$50,000	$0	$0	$0	$0	$0
	Project Directs Total w/Risks	**$499,300**	45.3%	**$185,200**	**$309,000**	**$5,100**	**$0**	**$0**	**$0**	**$0**
13	Indirects/Overhead	$565,500	51.4%	$91,700	$464,500	$9,300	$0	$0	$0	$0
14	AFUDC	$11,600	1.1%	$1,000	$10,600	$0	$0	$0	$0	$0
	Project Total - Baseline Budget	**$1,076,400**	97.7%	**$277,900**	**$784,100**	**$14,400**	**$0**	**$0**	**$0**	**$0**
15	Contingency	$24,800	2.3%	$0	$24,400	$400	$0	$0	$0	$0
	Project Total - Funding Approval Level	**$1,101,200**	100.0%	**$277,900**	**$808,500**	**$14,800**	**$0**	**$0**	**$0**	**$0**
16	Reimbursables/Customer Contribution	$0		$0	$0	$0	$0	$0	$0	$0
	Project Total (less reimbursables)	**$1,101,200**		**$277,900**	**$808,500**	**$14,800**	**$0**	**$0**	**$0**	**$0**

	Amount of Escalation included above	$400	$0	$0	$400	$0	$0	$0	$0
6	Total materials - Eversource	$100,200	$99,400	$800	$0	$0	$0	$0	$0
	Total materials - Contractor	$37	$37	$0	$0	$0	$0	$0	$0
	Total materials	$100,237	$99,437	$800	$0	$0	$0	$0	$0

NOTE: Risk / Contingency is 7.3% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)

Estimate Range

-25%	-	**25%**
$826,000	-	**$1,377,000**

COMMENTS:

Project Scope:

OCB Replacement and Bus Rehab Obsolescence Projects:
OCB Replacement:

[redacted]

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

Engineering to be outsourced with in-house review, construction to utilize internal resources and with internal Test resources.
This estimate was developed with the use of existing Breaker control conduits with no digging in existing soil.
This estimate was developed utilizing the existing foundation, no new foundations were included in this estimate. The foundation load calculation verified that the existing foundation can handle the load of the new Breaker.
The OCB replacement Project estimation was predicated on that it will be done concurrently with the Bus Rehab Project and takes advantage of economy of scale.
Prior actuals are from WO # CS002451 OCB Total Costs $649,522 (Oct 1, 2020) Costs were allocated to Phases 1, 2 and 3 in proportion to costs spent for each phase.
Material estimates based on previous work.
All new equipment will be installed within the confines of the existing fenced yard.
No additional allowances have been added for aggressive outage recall times.
Estimate includes risk for all new control cables to be installed in the event of failure during megger testing and installed in existing raceways for all (3) three new Breakers that are included in this estimate.

RISKS

Installation of all new control Breaker cables 2020	$ 25,000
Weather delay	$ 25,000
0	
0	
0	
0	

Project Number:C800384

Project Title:OCB Replacement and Bus Rehab

Escalated Line Item Dollars

Project Number:C800384
Date of Estimate:10/09/20
Est. Revision # 5
Template Revision #:01.4

Row	PAF (old)	Cover (old)	PAF (break	WBS	CSTXX-CONSTRUCTION	R		Prior actuals to date Mhrs	Prior actuals to date DOLLARS	Mhrs	2020 DOLLARS	Mhrs	2021 DOLLARS	Mhrs	2022 DOLLARS	Mhrs	2023 DOLLARS	Mhrs	2024 DOLLARS	Mhrs	2025 DOLLARS	Mhrs	TOTAL DOLLARS
							0%				0		1		2		3		4		5		
1					Electrical Construction	LT	0%	0	$0	2,500	$81,141	0	$0	0	$0	0	$0	0	$0	0	$0		$81,141
2					General Construction	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
3					SCADA / Automation	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
4					Telecom - Field	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
5					Construction Reps (Internal)	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
6					Support Switch/Tag	LT	0%	0	$0	[redacted]	$20,600	0	$0	0	$0	0	$0	0	$0	0	$0		$20,600
7					Other (specify)	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
8					Other (specify)	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
9					Other (specify)	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
10					LT Total		0%	0	$0	[redacted]	$101,741	0	$0	0	$0	0	$0	0	$0	0	$0		$101,741
11					Employee Expenses	AE	0%	0	$0		$5,067		$0		$0		$0		$0		$0		$5,067
12					Construction Purchased Material	AM	1%	0	$0		$813		$0		$0		$0		$0		$0		$813
13					Outside Construction Vendor	AO		0	$52,849	[redacted]	$156	0	$0	0	$0	0	$0	0	$0	0	$0		$53,005
14					Sales tax on Constr. Vendor		0.0%	0	$0		$0		$0		$0		$0		$0		$0		$0
15					Vehicles (now in Indirects section)	AV	0%	0	$0		$0		$0		$0		$0		$0		$0		$0
16					Inspection services (Outside Vendor)	AO		0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
17					Construction Rep (Outside vendor)	AO		0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
18					Rents and Leases	RR		0	$0		$0		$0		$0		$0		$0		$0		$0
19					CSTXX Subtotal		0%		$52,849		$107,797		$0		$0		$0		$0		$0		$158,646
20					Escalation			0	$0		$ -		$ -		$ -		$ -		$ -		$ -		$ -
21						0	P1	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
22					CSTXX Total		0%	0	$52,849	[redacted]	$107,797	0	$0	0	$0	0	$0	0	$0	0	$0		$158,646
23					ENRXX-TG ENGINEERING/DESIGN		0%																$0
24					Project Services/Cnstrctn	LT	0%	0	$1,914	[redacted]	$2,060	[redacted]	$1,697	0	$0	0	$0	0	$0	0	$0		$5,671
25					T- Line Engineering/Design	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
26					D- Street Engineering/Design	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
27					Civil Engineering/Design	LT	0%	0	$1 148	[redacted]	$1 236	0	$0	0	$0	0	$0	0	$0	0	$0		$2 384
28					Substation (T) Engineering/Design	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
29					Substation (D) Engineering/Design	LT	0%	0	$8,611	[redacted]	$9,270	0	$0	0	$0	0	$0	0	$0	0	$0		$17,881
30					Protection & Controls Engineering	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
31					Survey Engineering	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
32					SCADA / Automation Engineering	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
33					Telecom Engineering	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
34					Substation (D) Engineering/Design OT	LT	0%	0	$4,848	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$4,848
35					Other - specify	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
36					LT Total		0%	0	$15,520	[redacted]	$12,566	[redacted]	$1,697	0	$0	0	$0	0	$0	0	$0		$30,784
37					Employee Expenses	AE	0%	0	$583		$628		$84	0	$0	0	$0	0	$0	0	$0		$1,295
38					Contractor Engineering - T-Lines	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
39					Contractor Engineering - D-Street	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
40					Contractor Engineering - T -Station	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
41					Contractor Engineering - D-Station	AO	0%	0	$18,944	[redacted]	$18,240	[redacted]	$2,506	0	$0	0	$0	0	$0	0	$0		$37,690
42					Contractor Engineering - PMC	AO	0%	0	$0	[redacted]	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
43					Contractor Engineering - Survey	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
44					Contractor Engineering - SCADA / Automation	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
45					Contractor Engineering - Telecom	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
46					Contractor Engineering - Specify	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
47					Contractor Engineering - Specify	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
48					Contractor Engineering - Specify	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
49					Vehicles (now in Indirects section)	AV	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
50					ENRXX Subtotal		0%	-	$34,048	[redacted]	$31,434	[redacted]	$4,286	-	$0	-	$0	-	$0	-	$0		$69,768
51					Escalation		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
52						0	P1	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
53					ENRXX Total		0%	-	$34,048	[redacted]	$31,434	[redacted]	$4,286	-	$0	-	$0	-	$0	-	$0		$69,768
54					LNDXX-TG LAND		0%																0
55					Real Estate	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
56					Employee Expenses	AE	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
57					Purchase Land	AM	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
58					Vehicles (now in Indirects section)	AV	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
59					Fees and Payments	RF	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
60					LNDXX Subtotal		0%	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
61					Escalation		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
62						0	P1	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
63					LNDXX Total		0%	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
64					MATXX-TG MATERIAL		0%																$0
65					Eversource	AM	0%	0	$99 437	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$99 437
66					Outside Services	AM	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
67						AM	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
68					Freight		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
69					Sales Tax Eversource/outside services		4%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
70					Other		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
71					MATXX Subtotal		0%		$99 437		$0		$0		$0		$0		$0		$0		$99 437
72					Escalation		0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
73						0	P1	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
74					MATXX Total		0%		$99 437		$0		$0		$0		$0		$0		$0		$99 437
75					PSMXX-PROJECT MANAGER & SUPPORT		0%																$0
76					Project Management (PM)	LT	0%	0	$0	[redacted]	$5,150	[redacted]	$530	0	$0	0	$0	0	$0	0	$0		$5,680
77					Project Planning/Cost (P)	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
78					Contracts/Purchasing (C/P)	LT	0%	0	$0	[redacted]	$515	0	$0	0	$0	0	$0	0	$0	0	$0		$515
79					System Planning	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
80					Environmental	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
81					SCS - None	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
82					Legal	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
83					Estimating	LT	0%	0	$0	[redacted]	$2 575	0	$0	0	$0	0	$0	0	$0	0	$0		$2 575
84					Siting - None	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
85					Asset Management	LT		0	$0	[redacted]	$515	[redacted]	$212	0	$0	0	$0	0	$0	0	$0		$727
86					Other -	LT		0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
87					Other -	LT		0	$0														
88					Other -	LT		0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
89					Other -	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
90					LT Total		0%		$0	[redacted]	$8 755	[redacted]	$742	0	$0	0	$0	0	$0	0	$0		$9 497
91					Employee Expenses	AE	0%	0	$438		$437	0	$0	0	$0	0	$0	0	$0	0	$0		$875
92					Project Support Vendor - PM	AO	0%	0	$0	[redacted]	$9 000	-	$0	-	$0	-	$0	-	$0	-	$0		$9 000
93					Project Support Vendor - P	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
94					Project Support Vendor - C/P	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
95					Project Support Vendor - System Planning	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
96					Project Support Vendor - Environmental	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
97					Project Support Vendor - SCS - None	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
98					Project Support Vendor - Legal	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
99					Project Support Vendor - Estimating	AO	0%	0	$0	[redacted]	$3,000	-	$0	-	$0	-	$0	-	$0	-	$0		$3,000
100					Project Support Vendor - Siting - None	AO	0%	0	$0	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
101					Project Support Vendor - Asset Management	AO	0%	0	$0	[redacted]	$4 500	-	$0	-	$0	-	$0	-	$0	-	$0		$4 500
102					Project Support Vendor - Other	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
103					Project Support Vendor - Other	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
104					Project Support Vendor - Other	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
105					Project Support Vendor - Other	AO	0%	0	$0	-	$0	-	$0	-	$0	-	$0	-	$0	-	$0		$0
106					Vehicles (now in Indirects section)	AV	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
107					Property CWIP tax lapse and allowance	RF	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
108					0	BR	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
109					Fees and Payments - Environmental	BF	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
110					Fees and Payments - Siting	BF	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
111					Fees and Payments - Other	BF	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
112					PSMXX Subtotal		0%	-	$0	[redacted]	$25 693	-	$779	-	$0	-	$0	-	$0	-	$0		$26 472
113					Escalation		0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
114						0	P1	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
115					PSMXX Total		0%	-	$0	[redacted]	$25 693	[redacted]	$779	-	$0	-	$0	-	$0	-	$0		$26 472
116					REMXX-TG REMOVAL		0%																$0
117					Engineering/Design	LT	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
118					Internal Construction	LT	0%	0	$0	[redacted]	$10,640	0	$0	0	$0	0	$0	0	$0	0	$0		$10,640
119					LT Total		0%	0	$0	[redacted]	$10,640	0	$0	0	$0	0	$0	0	$0	0	$0		$10,640
120					Employee Expenses	AE	0%	0	$0		$1,626		$0		$0		$0		$0		$0		$1,626
121					Outside Services	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
122					Contractor Labor	AO	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
123					Vehicles (now in Indirects section)	AV	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
124					Rents and Leases	BR	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
125					REMXX Subtotal		0%	-	$0	[redacted]	$12,466	-	$0	-	$0	-	$0	-	$0	-	$0		$12,466
126					Escalation		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
127						0	P1	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
128					REMXX Total		0%	-	$0	[redacted]	$12,466	-	$0	-	$0	-	$0	-	$0	-	$0		$12,466
129					TSTXX-TG TEST		0%																$0
130					Test / Field Engr. Labor (In House)	LT	0%	0	$0	[redacted]	$61,800	0	$0	0	$0	0	$0	0	$0	0	$0		$61,800
131					Lead Commissioning Engr. (LCE) (Internal)	AO	0%	0	$0	[redacted]	$12,360	0	$0	0	$0	0	$0	0	$0	0	$0		$12,360
132					Employee Expense	AE	10%	0	$0	0	$7,416	0	$0	0	$0	0	$0	0	$0	0	$0		$7,416
133					Test / Field Engr. Labor (contractor)	AO	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
134					Lead Commissioning Engr. (LCE) (contractor)	AO	0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
135					Vehicles (now in Indirects section)	AV	0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
136					TSTXX Subtotal		0%		$0	0	$81,576	0	$0	0	$0	0	$0	0	$0	0	$0		$81,576
137					Escalation		0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
138						0	P1	0%	0	$1,000	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$1,000
139					TSTXX Total		0%		$1,000	[redacted]	$81,576	0	$0	0	$0	0	$0	0	$0	0	$0		$82,576
140					SUBTOTAL PROJECT DIRECT COST		0%	-	$188,334	[redacted]	$258,966	[redacted]	$8,065	-	$0	-	$0	-	$0	-	$0		$449,365
141							0%																$0
142					Risk																		
143					Risk			0	$0	0	$50,000	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$50,000
144					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
145								0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
146					Risk Total		0%		$0	0	$50,000	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$50,000
147					TOTAL PROJECT DIRECT COST		0%	-	$188,334	8,507	$308,966	[redacted]	$8,065	-	$0	-	$0	-	$0	-	$0		$499,365
148																							
149					INDIRECTS		0%															0	$0
150					Non-Productive Time Allocation (ZB)	59	10.1%	0	$4,224		$31,313	0	$368	0	$0	0	$0	0	$0	0	$0	0	$35,905
151					Payroll Benefits Allocation (ZE) incl NPT	59	44.6%	0	$11,254		$94,532	0	$0	0	$0	0	$0	0	$0	0	$0	0	$105,786
152					Gen SWE OD Overhead (ZF) incl NPT	60	80.6%	0	$4,035		$19,624	0	$2,245	0	$0	0	$0	0	$0	0	$0		$25,872
153					E&S Allocations (ZI)	61	68.4%	0	$58,156		$240,973	0	$5,804	0	$0	0	$0	0	$0	0	$0		$304,733
154					AS&E Allocations (ZJ)	62	1.3%	0	$3,099		$8,099	0	$196	0	$0	0	$0	0	$0	0	$0	0	$11,294
155					Stores Expense Allocation (ZC)	62	7.4%	0	$8,837		$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$8,837
156					Lobby Stock		0.0%	0	$0		$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
157					MDEC		3.0%	0	$1,912		$11,695	0	$231	0	$0	0	$0	0	$0	0	$0	0	$13,838
158					Vehicles		28.0%	0	$267	0	$58,267	0	$693	0	$0	0	$0	0	$0	0	$0	0	$59,227
159						0	0.0%	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
160					Indirects Subtotal		0%		$91,739		$464,452		$9,297		$0		$0		$0		$0	0	$565,488
161					TOTAL PROJECT COST - Direct & Indirect / excl AFUDC)				$277,073		$773,418		$14,362		$0		$0		$0		$0		$1,064,853
162					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
163					AFUDC			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
164					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
165					AFUDC (ZK)			0	$1,000	0	$10,603	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$11,603
166					In Service Dollars																		
167					Cumulative ISS			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
168					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
169					AFUDC Subtotal				$1 000		$10,603		$0		$0		$0		$0		$0		$11,603
170																							
171																							
172					TOTAL PROJECT COST - Baseline Budget				$278,073		$784,021		$14,362		$0		$0		$0		$0		$1,076,456
173					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
174					Contingency			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0		$0
175					Contingency			0	$0	0	$24,355	0	$446	0	$0	0	$0	0	$0	0	$0	0	$0		$24,801
176					Other			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
177					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
178					Contingency SubTotal				$0		$24,355		$446		$0		$0		$0		$0		$24,801
179					0																		
180					TOTAL PROJECT COST - Approved Funding			0	$278,073		$808,376	0	$14,808	0	$0	0	$0	0	$0	0	$0	0	$0	0	$1,101,257
181					0			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
182					Reimbursables / Customer Contribution			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
183					Reimbursables / Customer Contribution (enter as negative)			0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
184					0	59	20200070	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
185					TOTAL PROJECT COST				$278,073		$808,376		$14,808		$0		$0		$0		$0	0	$1,101,257
186								-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

11/05/2020 7:45 AM

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Constructability Review Form: **Substation**

Project Title: Replace OCB's at [redacted]	☐	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS00394	**Project Constructability Phase:**	
Date(s) of Constructability Review: 07/08/2020	☐ Conceptual Engineering Design	
Click to enter a date	☒ Preliminary Engineering Design	
	☐ Detailed Engineering Design	
Project Scope Statement: **Replace the 1A-19t-2, 1A-21T-2 and the 1A-22T-2 and associated busses**		

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	Name
☒	☐	Project Management	[redacted]	☐	☐	S/S Engineering	[redacted]
☐	☐	Asset Management		☐	☐	P&C Engineering	
☐	☐	Constr. Management		☐	☐	Civil Engineering	
☐	☐	S/S Technical / LCE		☐	☐	Telecom	
☐	☐	S/S Operations**		☐	☐	Environmental	
☒	☐	Field Engineering		☐	☐	Real Estate	
☐	☐	Line Engineering		☐	☐	T&D ROW	
☐	☐	Vegetation Management		☐	☐	Survey Engineering	
☐	☐	Siting		☐	☐	Cost Estimating	
☐	☐	Safety		☐	☐	Outreach (SCS)	
☐	☐	SCADA		☐	☐	Material Procurement	

*** Sign-off in the table above for the Detailed Engineering Design Constructability Review indicates that all Action Items/Concerns from prior Constructability Reviews have been mitigated/resolved as documented in this form. Not every department is required to attend walkdowns for every project but should be consulted for project impact considerations**

** Internal Eversource Substation Operations must be included in review even if external construction resources are planned

Project Manager certifies that this review was performed to completeness, that all applicable departments were informed of the project and have had opportunity to provide input to this review:

[redacted] *7/8/2020* [redacted] 07/20/20 *Name / Signature*

Date

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Constructability Review Form: **Substation**

Documents available for use on Constructability Review					
[X]	**Deliverable**	**[X]**	**Deliverable**	**[X]**	**Deliverable**
☐	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	☐	Previous Notes	☐	Identify Required Contractors
☐	Proposed Schedule	☐	Major Material List	☐	Replace / Reuse of equipment
☒	Construction Sequence/Timeline	☐	Major Equipment Items	☐	Pre-Walkdown Comments / Observations

Action Items and Resolutions:

Item No.	Const. Review Action Item/Concern	Design Resolution/Mitigation:
1	**Outage schedule to be submitted by B.Rouleau**	
2	**Material delivery, late August for new breakers**	
3	**IFC drawings, Gerry Burke, early August**	
4		
5		

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
A	**General**		
1	**Any safety hazards specific to the facility? i.e. Low Bus, Deterioration, etc.**	☒	
2	**Prior known Site Specific Conditions - Common or Obvious station Issues**	☐	May be issues with control cables
3	**Scope Adequately Developed** Consider Physical Installation, P&C Scope, Civil Scope, Engineering studies, Design standard adherence	☐	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
4	**Materials Identified/Ordered** Long Lead Equipment? Specialty material considerations? Review BOM lead times and project need dates Bids for Specialty Major Materials - Identify Specialty Equipment & Materials potentials - temporary/replacement Any Materials needed to facilitate construction access?	☐	Breakers ordered, Delivery for August, could be delayed at US/Mexico border. New switches not available, replace after OCBs replaced
5	**Any impacts that would drive T-Line Eng Scope?**	☒	
6	**Any other known projects that could overlap or impact outage work?**	☒	
B	**Construction**		
1	**Site Plan / Access:** -Confirm maintenance access for proposed new or replaced equipment -Review station expansion areas (if needed) for structures, old foundations, etc. -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) -Site Development Plan (grading and drainage) with Cut/Fill -Existing Rock Conditions? Potential Impacts (rock quantity)? -Any Sanitary Civil Requirements? (Septic tanks, etc) -Assess condition of existing yard equipment foundations and viability for reuse (if proposed)	☒	
2	**Any Substation Access and site/yard access Limitations?** -Review turning radius for delivery trucks (if critical) -Identify Office Trailer / Container / Dumpster Space + source of utilities for construction trailer(s) if needed -Weather impacts to Site (Snow Placement) -Identify Material Laydown and Security -Construction permit for trailers outside substation fence?	☐	Tight clearances for breaker removal, may need additional outages to remove

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
3	**Outage Planning & Construction Sequence** -Working Clearances - Review electrical clearances for equipment during construction – Approach Distances – Outage Requirements to maintain electrical clearances throughout proposed installation -As-Built drawing review (contacts and contributions) -Outage boundaries -Phased approach needs for additional mobilizations -Detail Design package align with schedule and outage sequence? -Lead Commissioning Engineer (LCE), Substation Operations, and Outage Planner - Review or give input to planned construction sequence to insure it is reasonable and scheduled outages associated with the sequence -Review or give input to planned construction sequence to insure it is reasonable -Verify outage sequence supports the planned construction sequence	☐	B.Rouleau to provide outage schedule. Need IFC drawings to determine exact boundary
4	**Need for mobile generator and where connected (if needed)**	☒	
5	**Need for mobile battery and where connected (if needed)**	☒	
6	**Energization Plan** What outages are required, Detailed look at contributions to equipment, Detailed look at protection zone changes, Locked sequence or random outages, Outage durations minimized Mobile transformer, Additional outage requirements, Working clearance, Railroad Catenaries, Distribution overhead/underground/networks, Fiber outage, SCADA outage, Relay permissions	☐	To be reviewed once IFC drawings issued
7	**Identify Required Oversite Needed - Estimated level of CR and LCE support needed**	☐	LCE review needed
8	**OT work required or Notable Permit Conditions (special hours)?**	☐	May be needed is earlier than planned restoration is needed to to cable failure
9	**Seasonal or weather conditions impacts?**	☐	
10	**Identify Required Depts for Construction? (who is constructor ?)**	☐	Internal resources for construction and test
11	**Specialty Contractors Required?**	☒	
12	**Unique Equipment Considerations, Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser**	☒	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
13	**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.)	☐	Engineering to provide conduit prints is control cables tests poorly
14	**Any other items missing in scope or could be underfunded?**	☐	
15	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	☐	
C	**Environmental**		
1	Soil Pre-Characterization or Grab Sampling Completed/Planned	☒	
2	Has Desktop investigation and EAD Review form been completed.	☒	
3	Dewatering requirements	☒	
4	Risk or presence of PCB's/Asbestos/Lead/SF6	☐	
5	Permit requirements (Wetlands, Rare Species, etc)	☒	
6	Stormwater Considerations	☒	
7	Transformer Spill Containment Recommended?	☒	
8	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)	☒	
D	**Siting, S&CS, and T&D Real Estate**		
1	Expanding Footprint / New Buildings or future Expansion Plans?	☒	
2	Installation is within Eversource Rights? - Rights and Restrictions Review	☒	
3	Proposed Equipment on same property? - Any Encroachments	☒	
4	Identify existing lighting and determine if additional lighting is needed?	☒	
5	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	☒	
6	Visual mitigation screening considerations (feasibility or location)	☒	
7	Neighbor/Abutter impacts (noise, visual, sensitive abutters)	☒	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
E	**Engineering**		
1	**Scope of Work** Identify if high level scope sufficiently detailed? Any remote station impacts? Does title match the project deliverable/intent?	☐	No specific scope yet. Eng to issue
2	**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	☒	
3	**Materials** Any concerns with BOM/Major Materials Review? Where will new vs removed equipment go? Review for OH and UG Items	☐	Material on order scheduled for August delivery
4	**Control House** - Review: Unmapped equipment interferences, Control/Battery Enclosure Layout, HVAC System (if equipment added), space for new or modified equipment, AC / DC station service and loading, Panel Space, Expansion, one-line and/or riser type panelboard drawings, other..	☒	
5	Identification of Unique Requirements, i.e. (access bridges, station service, etc.)	☒	
6	**BPS Separation Requirements** Is this BPS Substation? Y/N (part of PAF) Changes to pre-existing BPS standards?	☒	
7	IEC 61850 Substation Automation and Communication Requirements - Any Impacts/Retrofit needed?	☒	
8	Any Upgrades to ES Standards - Is retrofit needed to bring up to ES standards? Can that be done?	☒	
9	**Wall, Fence, Gate, and Foundation Considerations** -Any permanent / temporary alterations or relocations required? -Take measurements for Foundation quantities, dimensions and concrete volumes -CIP Review/Ballistic needs. Any Physical Security Requirement Consideration? -Any impacts to construction plan?	☐	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
10	**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?	☒	
11	**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	☒	
12	Any Lighting Plan & Fixture Schedule Considerations?	☒	
13	Any Steel Structural Plan Considerations?	☐	Will need steel for new breakers
14	Sound Study Needed? Pre-Project Sound Measurements Needed? Sound Walls?	☒	
15	Engineering Estimates for Design and Technical Support? (EE and EOC) Total Project	☒	
16	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	☒	
17	Any design alterations or considerations to Eliminate SCLL Conditions, Reduce Recall Time, Reduce Outage durations, Special Conditions	☒	
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	☒	
2	Space on existing panels for new equipment? (front & rear of panel fronts)	☒	
3	Panel fronts conform to drawings	☒	
4	Access to bring new panels into control enclosure	☒	
5	Nameplate list and location of nameplates	☒	
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	☒	
7	Verify auxiliary panels have breaker available or space for new breakers (if needed)	☒	
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	☒	
2	Review path to get telecom circuits into the station and determine whether new underground duct bank is needed.	☒	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.	☒	
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.	☒	
5	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination	☒	
6	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed	☒	
7	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	☒	
8	Review third party Telecommunications at substation and confirm whether additional capacity or Ground Potential Rise protection is required	☒	

Photos

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

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
Project: CS00394 [redacted] Replace 3 OCB's (CS00394) Phase 1		145.0	28-Feb-2020 A	31-Mar-2021		
WBS: CS00394.01 INITIALIZATION AND SCOPE DEVELOPEMENT		97.0	01-Apr-2020 A	21-Jan-2021		
START	SCHEDULE START MILESTONE	0.0	01-Apr-2020 A			A1010, PI1200, A3
WBS: CS00394.01.01 Initial Funding		0.0	01-Apr-2020 A	01-Apr-2020 A		
PI1400	Assign Project Manager	0.0	01-Apr-2020 A	01-Apr-2020 A	PI1300	PI1500, PI1600, C
PI1500	Assign Scheduler	0.0	01-Apr-2020 A	01-Apr-2020 A	PI1400	CE1600
PI1600	Assign Cost Analyst	0.0	01-Apr-2020 A	01-Apr-2020 A	PI1400	CE1600
PI1200	Project Initiator Develop Intitial Funding Request	0.0	01-Apr-2020 A	01-Apr-2020 A	START	PI1000
PI1300	Initial Funding Request Approved	0.0	01-Apr-2020 A	01-Apr-2020 A	PI1000	PI1400
PI1000	Submit Initial Funding Request	0.0		01-Apr-2020 A	PI1200	PI1300
WBS: CS00394.01.02 SDC Approval		0.0	01-Apr-2020 A	22-Jun-2020 A		
CE1600	Conduct Project Team Kickoff Meeting	0.0	01-Apr-2020 A	01-Apr-2020 A	PI1500, PI1600,	CE1100, CE1000,
CE1400	ES Engineering Develop P&C Conceptual Engineering Design in Accordance with Deliverables Checklist	0.0	01-Apr-2020 A	22-Apr-2020 A	CE1600	CE1700, CE1710
CE1100	Develop Electrical Substation Conceptual Engineering Design in Accordance with Deliverables Checklist	0.0	01-Apr-2020 A	22-Apr-2020 A	CE1600	CE1700, CE1710
CE1000	ES Engineering Develop Civil Substation Conceptual Engineering Design in Accordance with Deliverables	0.0	01-Apr-2020 A	22-Apr-2020 A	CE1600	CE1700, CE1710
CE1710	Conduct Conceptual Constructability Walk Down	0.0	23-Apr-2020 A	23-Apr-2020 A	CE1100, CE140	CE1700
CE1700	N/R (per SA 5/13/20) Review Conceptual Siting & Permitting (If Required)	0.0	13-May-2020 A	13-May-2020 A	CE1710, CE110	CGE1000
CGE1000	Develop Conceptual Grade Estimate (-25%+50%)	0.0	18-May-2020 A	20-May-2020 A	CE1700	SSF1000
SDC1000	N/R Solution Design Committee(SDC) Approval	0.0	22-Jun-2020 A	22-Jun-2020 A	SSF1000	A3370, T3001
SSF1000	N/R Develop Solutions Selection Form (SSF)	0.0	22-Jun-2020 A	22-Jun-2020 A	CGE1000	SDC1000
WBS: CS00394.01.09 Project Initiation		20.0	22-May-2020 A	28-Sep-2020		
WBS: CS00394.01.09.2 EPAC Partial Funding		0.0	22-May-2020 A	22-May-2020 A		
PF1000	N/R-EPAC Partial Funding Approval-From Initial to Full Funding 5/22/20	0.0	22-May-2020 A	22-May-2020 A		
WBS: CS00394.01.09.3 EPAC Full Funding		20.0	08-Jul-2020 A	28-Sep-2020		
DE1900	Conduct Detail Constructability Walk Down	0.0	08-Jul-2020 A	08-Jul-2020 A	DSSE-100, DS	DE1800
DE1710	Project Constructability Review Complete	0.0	08-Jul-2020 A	08-Jul-2020 A	DE1700	DE1600
DE1800	N/R Review Detail Siting & Permitting (If Required)	0.0	09-Jul-2020 A	09-Jul-2020 A	DE1900, DSSE	DE1700
DE1700	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM)	0.0	10-Jul-2020 A	03-Aug-2020 A	DE1800	DE1710
DE1600	Create Planning Grade Estimate (+/-25% Full Funding)	0.0	20-Jul-2020 A	27-Jul-2020 A	DE1710	FF1000, PAFF200
PAFF2000	Submit Full Funding PAF for Internal Review	0.0	28-Jul-2020 A	07-Aug-2020 A	DE1600	PAFF2100
PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review	5.0	28-Jul-2020 A	04-Sep-2020	PAFF2000	PAFF2200
PAFF2200	Incorporate EPAC Full Funding PAF Review Comments	5.0	08-Sep-2020	14-Sep-2020	PAFF2100	FF1000
FF1000	EPAC Full Funding Approval	10.0	15-Sep-2020	28-Sep-2020	DE1600, PAFF2	A3430, A3540, A3
WBS: CS00394.01.13 OVERHEAD / INDIRECTS		10.0	31-Aug-2020	14-Sep-2020		
WBS: CS00394.01.13.01 PROJECT MANAGEMENT		10.0	31-Aug-2020	14-Sep-2020		
A1170	Prepare CAN (Construction Authorization Notice)	10.0	31-Aug-2020*	14-Sep-2020	DSSE-120, A34	AT0203
WBS: CS00394.01.12 T-Minus Milestones		88.0	15-Jun-2020 A	21-Jan-2021		
WBS: CS00394.01.12.1 T-Minus Milestones "A" Group - Circuit Breakers		88.0	15-Jun-2020 A	21-Jan-2021		
T3001	T-30.01 - Eng. Project Scoping Document Issued (Scope Lockdown)	0.0		15-Jun-2020 A	SDC1000	AT00
AT0814	N/R A-T-08.14 Construction Contracts / PSA In Place	0.0		22-Jun-2020 A	A3460, A3420	AT00
T2605	T-26.05 - 30% Design / Engineering Completed	0.0		29-Jun-2020 A	DSSE-410, DS	AT00

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
AT0805C	N/R (per SA) A-T-08.05.Civil IFC - Civil (BG) w/BOM	0.0		20-Jul-2020 A	DSSE-120	AT00
AT2404	A-T-24.04 DETERMINE / ASSIGN LCE (LEAD COMMISSIONING ENGINEER)	0.0		27-Jul-2020 A	A2930	AT00
T1811	T-18.11 - 70% Design/Engineering Completed	0.0		27-Jul-2020 A	DSSE-230, DS	A3360, AT00
AT0409	N/R A-T-04.09 ALL FIRM TOA APPLICATIONS DUE TO LCC	0.0		24-Aug-2020 A	A1730	AT00
AT0805E	A-T-08.05.Elect IFC - Electrical (AG) w/Final BOM	0.0		26-Aug-2020 A	DSSE-240	AT00
AT00	A-T-00 - START OF CONSTRUCTION - WO#CS00394 (Circuit Breackers)	0.0	14-Sep-2020*		AT0805E, AT12	CFM- Breakers, C
AT0203	A-T-02.03 CAN COMPLETE (CONSTRUCTION AUTHORIZATION NOTICE)	0.0		14-Sep-2020*	A1170	AT00
AT1201	A-T-12.01 SCADA Date (Tab) Sheets/Signal List Sent to LCC	0.0		28-Sep-2020*	DSSE-990	AT00
AT1301	A-T-13.01 COMMISSIONING PLAN COMPLETE	0.0		30-Sep-2020*	A2950, A3300	AT00
AT0805P	A-T-08.05.P&C IFC - P&C w/BOM	0.0		30-Sep-2020*	DSSE-220	AT00
T0805	T-08.05 - Final Engineering Issued for Construction W/BOM	0.0		30-Sep-2020*	DSSE-120, DS	AT00
AT1202	A-T-12.02 P/C DESCRIPTION / DRAFT OPERATING INSTRUCTIONS ISSUED	0.0		03-Nov-2020*	DSSE-930, DS	AT00
AT0401	A-T-04.01 ALL MATERIAL RECEIVED, STAGED, INVENTORIED, REVIEWED	0.0		21-Jan-2021*	DSSE-560, DS	AT00
WBS: CS00394.05 ENGINEERING & DESIGN		45.0	06-Apr-2020 A	03-Nov-2020		
WBS: CS00394.05.00 Engineering Services Staffing		0.0	06-Apr-2020 A	05-Jun-2020 A		
A3370	Decision Required Regarding Engineering Staffing (ES, COC, BID)	0.0	01-May-2020 A	01-May-2020 A	SDC1000	TMP1140
WBS: CS00394.05.00.02 EOC - Engineer of Choice Process		0.0	06-Apr-2020 A	05-Jun-2020 A		
TMP1140	Engineering of Choice (EOC) - Provide RFP to Single Vendor (19T, 21T and 22T, Bus Rehab)	0.0	06-Apr-2020 A	08-Apr-2020 A	A3370	TMP1150
TMP1150	Engineering of Choice (EOC) - Vendor Responds with Proposal (19T, 21T and 22T, Bus Rehab)	0.0	08-Apr-2020 A	22-Apr-2020 A	TMP1140	TMP1200
TMP1180	Engineering of Choice (EOC) - EOC Committee Reviews at Monthly Meeting & Approves (19T, 21T and 2	0.0	19-May-2020 A	19-May-2020 A	TMP1200	TMP1220
TMP1200	Engineering of Choice (EOC) - DR# 432937 Prepared by Project Engineer & Project Controls (19T, 21T a	0.0	20-May-2020 A	21-May-2020 A	TMP1150	TMP1180
TMP1220	Engineering of Choice (EOC) - PO # 38392005 Issued for Vendor Design Effort (19T, 21T and 22T, Bus R	0.0	22-May-2020 A	05-Jun-2020 A	TMP1180	DSSE-100, DSSE
WBS: CS00394.05.01 Civil Engineering		0.0	26-May-2020 A	26-Aug-2020 A		
DSSE-100	Vendor Submits 30% Civil Design to ES (19T, 21T and 22T, Bus Rehab)	0.0	26-May-2020 A	15-Jun-2020 A	TMP1220	DE1900, DSSE-11
DSSE-110	Vendor Incorporates 30% Comments/Submits 70% Civil to ES w/BOM	0.0	22-Jun-2020 A	15-Jul-2020 A	DSSE-1190	DSSE-1210, DSS
DSSE-1190	ES Reviews and Comments 30% Civil Design (19T, 21T and 22T, Bus Rehab)	0.0	25-Jun-2020 A	29-Jun-2020 A	DSSE-100	DSSE-110, T2605
DSSE-1210	ES Reviews and Comments 70% Civil Design w/BOM (19T, 21T and 22T, Bus Rehab)	0.0	16-Jul-2020 A	24-Jul-2020 A	DSSE-110	DSSE-1200, DSS
DSSE-1200	Vendor Incorporates 70% Comments/Submits 100% Civil Design for IFC to ES	0.0	27-Jul-2020 A	17-Aug-2020 A	DSSE-1210	DSSE-120
DSSE-120	ES Reviews 100% Civil Design (19T, 21T and 22T, Bus Rehab) IFC (Trans #13271)	0.0	26-Aug-2020 A	26-Aug-2020 A	DSSE-1200	A1250, A1170, AT
WBS: CS00394.05.02 Electrical Engineering		5.0	26-May-2020 A	03-Nov-2020		
DSSE-200	Vendor Submits 30% Electrical Design Package to ES	0.0	26-May-2020 A	15-Jun-2020 A	TMP1220	DE1800, DE1900,
DSSE-205	ES Reviews 30% Electrical Design	0.0	16-Jun-2020 A	29-Jun-2020 A	DSSE-200	DSSE-210, T2605
DSSE-210	Vendor Incorporates 30% Comments/Submits 70% Electrical Design to ES w/BOM	0.0	22-Jun-2020 A	15-Jul-2020 A	DSSE-205	DSSE-230, DSSE
DSSE-230	ES Reviews 70% Electrical Design w/BOM	0.0	16-Jul-2020 A	24-Jul-2020 A	DSSE-210	T1811, DSSE-122
DSSE-1220	Vendor Incorporates 70% Comments/Submits 100% Electrical IFC Design to ES	0.0	27-Jul-2020 A	17-Aug-2020 A	DSSE-230	DSSE-240
DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical) (Trans #13271)	0.0	20-Aug-2020 A	26-Aug-2020 A	DSSE-1220	A1250, AT0805E,
DSSE-920	Operating Instructions - SSED Review Draft Convex OI	5.0	28-Oct-2020	03-Nov-2020	DSSE-450	AT1202
DSSE-460	Operating Instructions - SSED Review Draft Distribution OI	5.0	28-Oct-2020	03-Nov-2020	DSSE-450	AT1202
WBS: CS00394.05.03 Distribution Thermal Ratings NX-9		0.0	22-Jun-2020 A	22-Jun-2020 A		
WBS: CS00394.05.03.05 Non NX-9 Thermal Ratings		0.0	22-Jun-2020 A	22-Jun-2020 A		
NX9A-EM74	N/R LTRC Files Feeder Capability Sheets	0.0	22-Jun-2020 A	22-Jun-2020 A	NX9A-EM64	

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
NX9A-EM64	N/R TRC Reviews and Approves Thermal Rating Data	0.0	22-Jun-2020 A	22-Jun-2020 A	NX9A-EM54	NX9A-EM74
NX9A-EM54	N/R LTRC Prepares and Sends Thermal Rating Data for TRC Review	0.0	22-Jun-2020 A	22-Jun-2020 A	NX9A-EM44	NX9A-EM64
NX9A-EM44	N/R P&C Develops and Provides LTRC with P&C Checklist & Thermal Ratings Data	0.0	22-Jun-2020 A	22-Jun-2020 A		NX9A-EM54
WBS: CS00394.05.04 P&C Engineering		45.0	26-May-2020 A	03-Nov-2020		
DSSE-400	Vendor Submits 30% P&C Design Package to ES	0.0	26-May-2020 A	15-Jun-2020 A	TMP1220	DSSE-410
DSSE-410	ES Reviews 30% P&C Design	0.0	16-Jun-2020 A	19-Jun-2020 A	DSSE-400	A3380, T2605
A3380	Vendor Incorporates 30% Comments/Submits 70% P&C Package Design to ES w/BOM	0.0	22-Jun-2020 A	15-Jul-2020 A	DSSE-410	A3580
A3580	ES Reviews 70% P&C Design w BOM	0.0	16-Jul-2020 A	20-Jul-2020 A	A3380	DSSE-450, DSSE
DSSE-1250	Vendor Incorporates 70% Comments/Submits 100% P&C IFC Design to ES	0.0	21-Jul-2020 A	17-Aug-2020 A	A3580	DSSE-1260
DSSE-1260	ES Issues- P&C Package IFC (Trans #13271)	0.0	20-Aug-2020 A	26-Aug-2020 A	DSSE-1250	AT00
DSSE-990	P&C INITIATE SCADA Data Sheets	20.0	31-Aug-2020	28-Sep-2020	DSSE-240	AT1201, DSSE-22
DSSE-220	SDS Complete	2.0	29-Sep-2020	30-Sep-2020	DSSE-210, DS	AT0805P, T0805
DSSE-450	Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	20.0	29-Sep-2020	27-Oct-2020	FF1000, A3580	DSSE-460, DSSE
DSSE-470	Operating Instructions - P&C Review Draft Distribution OI	5.0	28-Oct-2020	03-Nov-2020	DSSE-450	AT1202
DSSE-930	Operating Instructions - P&C Review Draft Convex OI	5.0	28-Oct-2020	03-Nov-2020	DSSE-450	AT1202
WBS: CS00394.06 MATERIAL PROCUREMENT		97.0	28-Feb-2020 A	21-Jan-2021		
WBS: CS00394.06.1 MATERIAL FOR P&C		37.0	31-Aug-2020	22-Oct-2020		
DSSE-510	MATERIAL - P&C - Prepare & Issue DR	5.0	31-Aug-2020	04-Sep-2020	A3580	DSSE-980
DSSE-980	MATERIAL - P&C - Procurement Issue PO	10.0	08-Sep-2020	21-Sep-2020	DSSE-510	DSSE-1000
DSSE-1000	MATERIAL - P&C - Material Vendor Delivery Leadtime	30.0	22-Sep-2020	21-Oct-2020	DSSE-980	DSSE-1010
DSSE-1010	MATERIAL - P&C - Engineering Confirm Material Delivery to Site	1.0	22-Oct-2020	22-Oct-2020	DSSE-1000	
WBS: CS00394.06.2 MATERIAL FOR ELECTRICAL		34.0	31-Aug-2020	19-Oct-2020		
DSSE-520	MATERIAL - Electrical - Prepare & Issue DR Misc Materials	11.0	31-Aug-2020	15-Sep-2020	DSSE-230	DSSE-1020
DSSE-1020	MATERIAL - ELectrical - Procurement Issue PO	5.0	16-Sep-2020	22-Sep-2020	DSSE-520	DSSE-1030
DSSE-1030	MATERIAL - ELectrical - Material Vendor Delivery Leadtime	25.0	23-Sep-2020	17-Oct-2020	DSSE-1020	DSSE-530
DSSE-550	MATERIAL - Electrical - Material Handler Confirm Material Delivery to Site	1.0	19-Oct-2020	19-Oct-2020	DSSE-530	AT0401
DSSE-530	Electrical (AG) Material Ordered	0.0		19-Oct-2020	DSSE-1030	DSSE-550
WBS: CS00394.06.3 MATERIAL FOR CIVIL		0.0	18-Aug-2020 A	18-Aug-2020 A		
DSSE-560	N/R MATERIAL - CIVIL - Material Handler Confirm Material Delivery to Site	0.0	18-Aug-2020 A	18-Aug-2020 A	DSSE-1050	AT0401
DSSE-500	N/R MATERIAL - CIVIL - Prepare & Issue DR Misc Materials	0.0	18-Aug-2020 A	18-Aug-2020 A	DSSE-1210	DSSE-1040, DSSI
DSSE-1050	N/R MATERIAL - CIVIL - Material Vendor Delivery Leadtime	0.0	18-Aug-2020 A	18-Aug-2020 A	DSSE-1040	DSSE-560
DSSE-1040	N/R MATERIAL - CIVIL - Procurement Issue PO	0.0	18-Aug-2020 A	18-Aug-2020 A	DSSE-500, DS	DSSE-1050
DSSE-540	N/R Civil (BG) Material Ordered	0.0		18-Aug-2020 A	DSSE-500	DSSE-1040
WBS: CS00394.06.4 MATERIAL FOR SWITCHES		97.0	15-Jul-2020 A	21-Jan-2021		
DSSE-1280	MATERIAL - SWITCHES - Prepare & Issue DR #450417	0.0	15-Jul-2020 A	20-Jul-2020 A	DSSE-110	DSSE-1310, DSSI
DSSE-1290	MATERIAL - SWITCHES - Procurement Issue PO #11028368 (# GOD's)	0.0	21-Jul-2020 A	28-Jul-2020 A	DSSE-1280	DSSE-1300
DSSE-1310	SWITCHES (AG) Material Ordered	0.0		28-Jul-2020 A	DSSE-1280	DSSE-1300
DSSE-1300	MATERIAL - SWITCHES - Material Vendor Mfg and Delivery Leadtime	124.0	29-Jul-2020 A	01-Jan-2021	DSSE-1290, DS	DSSE-1270
DSSE-1270	MATERIAL - SWITCHES - Material Handler Confirm Material Delivery to Site	20.0	02-Jan-2021	21-Jan-2021	DSSE-1300	AT0401
WBS: CS00394.06.5 MATERIAL FOR REACTORS		97.0	15-Jul-2020 A	21-Jan-2021		
DSSE-1330	MATERIAL - REACTORS - Prepare & Issue DR # 450425	0.0	15-Jul-2020 A	20-Jul-2020 A	DSSE-110	DSSE-1360, DSSI

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
DSSE-1340	MATERIAL - REACTORS - Procurement Issue PO# 11028370 (# Reactors)	0.0	21-Jul-2020 A	28-Jul-2020 A	DSSE-1330	DSSE-1350
DSSE-1360	REACTORS (AG) Material Ordered	0.0		28-Jul-2020 A	DSSE-1330	DSSE-1350
DSSE-1350	MATERIAL - REACTORS - Mfg and Delivery Leadtime	124.0	29-Jul-2020 A	01-Jan-2021	DSSE-1340, DS	DSSE-1320
DSSE-1320	MATERIAL - REACTORS - Material Handler Confirm Material Delivery to Site	20.0	02-Jan-2021	21-Jan-2021	DSSE-1350	AT0401
WBS: CS00394.06.6 MATERIAL FOR BREAKERS		0.0	28-Feb-2020 A	31-Aug-2020 A		
DSSE-1150	MATERIAL - BREAKER - Prepare & Issue DR	0.0	28-Feb-2020 A	06-Mar-2020 A	FF1000	DSSE-1180, DSSI
DSSE-1160	MATERIAL - BREAKER - Procurement Issue PO	0.0	06-Mar-2020 A	20-Mar-2020 A	DSSE-1150	DSSE-1140
DSSE-1140	MATERIAL - BREAKER - Material Vendor Delivery Leadtime	0.0	20-May-2020 A	21-Aug-2020 A	DSSE-1160	DSSE-1130
DSSE-1180	Breaker (AG) Material Ordered	0.0		20-May-2020 A	DSSE-1150	DSSE-1130
DSSE-1130	MATERIAL - BREAKER - Material Handler Confirm Material Delivery to Site	0.0	29-Aug-2020 A	31-Aug-2020 A	DSSE-1140, DS	AT0401
WBS: CS00394.07 CONSTRUCTION		84.0	22-Jun-2020 A	14-Jan-2021		
WBS: CS00394.07.01 CONSTRUCTION SERVICES SELECTION		0.0	22-Jun-2020 A	22-Jun-2020 A		
A3550	STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/CONST ENGINEERING	0.0	22-Jun-2020 A	22-Jun-2020 A	START	A3430, A3390
WBS: CS00394.07.01.01 CONSTRUCTION SERVICES - CONTRACTOR OF CHOICE		0.0	22-Jun-2020 A	22-Jun-2020 A		
A3390	N/R CONST.SERVICES - COC - Eversource Provides Spec / RFQ to COC	0.0	22-Jun-2020 A	22-Jun-2020 A	A3550, FF1000	A3400
A3400	N/R CONST.SERVICES - COC - COC Evaluates Spec and Provides Quote	0.0	22-Jun-2020 A	22-Jun-2020 A	A3390	A3410
A3410	N/R CONST.SERVICES - COC - Eversource Reviews Quote from COC	0.0	22-Jun-2020 A	22-Jun-2020 A	A3400	A3420
A3420	N/R CONST.SERVICES - COC - Eversource Awards Contract - PO Issued	0.0	22-Jun-2020 A	22-Jun-2020 A	A3410, FF1000	AT0814, A1170
WBS: CS00394.07.01.02 CONSTRUCTION SERVICES - BID PROCESS		0.0	22-Jun-2020 A	22-Jun-2020 A		
A3430	N/R CONST.SERVICES - BID - Eversource provide Spec / RFP	0.0	22-Jun-2020 A	22-Jun-2020 A	FF1000, A3550	A3440
A3440	N/R CONST.SERVICES - BID - Contractors Evaluate RFP and Provide Proposal	0.0	22-Jun-2020 A	22-Jun-2020 A	A3430	A3450
A3450	N/R CONST.SERVICES - BID - Eversource reviews contractor proposals	0.0	22-Jun-2020 A	22-Jun-2020 A	A3440	A3460
A3460	N/R CONST.SERVICES - BID - Contract is Awarded - PO Issued	0.0	22-Jun-2020 A	22-Jun-2020 A	A3450, FF1000	AT0814, A1170
WBS: CS00394.07.03 CONSTRUCTION - CIVIL		5.0	14-Sep-2020	18-Sep-2020		
A1120	Construction - Civil (NO CIVIL IF 1:1 REPLACE AND SAME FOUNDATION; CONDUIT done by Electri	5.0	14-Sep-2020	18-Sep-2020	AT00	DSSE-900, CFM-
WBS: CS00394.07.04 CONSTRUCTION - ELECTRICAL CB		12.0	19-Sep-2020	30-Sep-2020		
A1130	Construction - Electrical - CIRCUIT BREAKERS	12.0	19-Sep-2020	30-Sep-2020	AT00, A1120	CFM- Breakers
WBS: CS00394.07.92 CONSTRUCTION - CONST.REP TASKS CB		10.0	31-Aug-2020 A	14-Jan-2021		
A1250	N/R Construction Rep SUBMIT OUTAGE REQUESTS for NON-transformer equipment (4 weeks before	0.0	31-Aug-2020 A	31-Aug-2020 A	DSSE-120, DS	
A1260	Construction Rep Finalize CASCADE Forms (within 14 days folloiwng ISD)	10.0	31-Dec-2020	14-Jan-2021	CFM- Breakers	A1030
WBS: CS00394.07.94 CONSTRUCTION RESOURCE TRACKING CB		108.0	14-Sep-2020	30-Dec-2020		
ConRep-S	CONSTRUCTION - CONSTRUCTION REP	108.0	14-Sep-2020	30-Dec-2020	CSM-Breakers	CFM- Breakers
CONSTelec	CONSTRUCTION - ELECTRICIAN	108.0	14-Sep-2020	30-Dec-2020	CSM-Breakers	CFM- Breakers
A1070	CONSTRUCTION - SWITCH OUT	1.0	15-Sep-2020	15-Sep-2020	TOA-Breakers	CFM- Breakers
A1080	CONSTRUCTION - SWITCH IN	1.0	24-Oct-2020	24-Oct-2020	TOA-Breakers	CFM- Breakers
WBS: CS00394.07.96 CONSTRUCTION OUTAGES CB		108.0	14-Sep-2020	30-Dec-2020		
CSM-Breakers	Construction Start Milestone CIRCUIT BREAKERS	0.0	14-Sep-2020		AT00	ConRep-S, TOA-E
TOA-Breakers	OUTAGE / General Construction Work	40.0	15-Sep-2020	24-Oct-2020	CSM-Breakers	CFM- Breakers, A
CFM- Breakers	Construction Finish Milestone	0.0		30-Dec-2020*	AT00, ConRep-S	A1040, DSSE-110
ISD - Breakers	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)	0.0		30-Dec-2020*	CFM- Breakers	DSSE-900
WBS: CS00394.07.98 CONSTRUCTION CLOSEOUT CB		7.0	31-Dec-2020	11-Jan-2021		

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
DSSE-900	Prepare Civil Field Mark Ups (Tie after Last Civil Construction Activity)	2.0	31-Dec-2020	04-Jan-2021	CFM- Breakers,	DSSE-860
DSSE-910	Test Group Prepare Electrical Field Mark Ups and Ensures Prints Ready for Pick-up (Tie after ISD)	2.0	08-Jan-2021	11-Jan-2021	CFM- Breakers,	DSSE-820
WBS: CS00394.09 TEST AND COMMISION		83.0	22-Jun-2020 A	30-Dec-2020		
WBS: CS00394.09.02 LCE PLANNING BREAKERS		22.0	20-Jul-2020 A	30-Sep-2020		
A3360	PM to Request Lead Commissioning Engineer GO/NO-GO Breakers	0.0	20-Jul-2020 A	22-Jul-2020 A	T1811	A2930
A2930	Assign Lead Commissioning Engineer Breakers	0.0	22-Jul-2020 A	23-Jul-2020 A	A3360	A2750, A3260, AT
A3350	Evaluate Drawings and Plan for Construction Outages Breakers	20.0	31-Aug-2020	28-Sep-2020	A2930	A1730
A2950	Develop Test and Commissioning Plan Breakers	15.0	04-Sep-2020*	25-Sep-2020	A3500, A3540, /	AT1301, A3300
A3300	LCE Review and Approve Vendor's Test and Commissioning Plan Breakers	3.0	28-Sep-2020	30-Sep-2020	A2950	A3270, AT1301
WBS: CS00394.09.01 TEST - SERVICES STAFFING DECISION		0.0	22-Jun-2020 A	22-Jun-2020 A		
A1010	N/R STAFFING DECISION: EVERSOURCE OR OUTSOURCE BID/COC TESTING	0.0	22-Jun-2020 A	22-Jun-2020 A	START	A3470, A3510
WBS: CS00394.09.01.01 TEST SERVICES - CONTRACTOR OF CHOICE		0.0	22-Jun-2020 A	22-Jun-2020 A		
A3470	N/R TEST SERVICES - COC - Eversource Provides Spec / RFQ to COC	0.0	22-Jun-2020 A	22-Jun-2020 A	A1010	A3480
A3480	N/R TEST SERVICES - COC - COC Evaluates Spec and Provides Quote	0.0	22-Jun-2020 A	22-Jun-2020 A	A3470	A3490
A3490	N/R TEST SERVICES - COC - Eversource Reviews Quote from COC	0.0	22-Jun-2020 A	22-Jun-2020 A	A3480	A3500
A3500	N/R TEST SERVICES - COC - Eversource Awards Contract - PO Issued	0.0	22-Jun-2020 A	22-Jun-2020 A	FF1000, A3490	A2950
WBS: CS00394.09.01.02 TEST SERVICES - BID PROCESS		0.0	22-Jun-2020 A	22-Jun-2020 A		
A3530	N/R TEST SERVICES - BID - Eversource reviews contractor proposals	0.0	22-Jun-2020 A	22-Jun-2020 A	A3520	A3540
A3540	N/R TEST SERVICES - BID - Eversource awards contract - PO Issued	0.0	22-Jun-2020 A	22-Jun-2020 A	FF1000, A3530	A2950
A3510	N/R TEST SERVICES - BID - Eversource provide spec / RFP	0.0	22-Jun-2020 A	22-Jun-2020 A	A1010	A3520
A3520	N/R TEST SERVICES - BID - Contractors Evaluate RFP and Provide Proposal	0.0	22-Jun-2020 A	22-Jun-2020 A	A3510	A3530
WBS: CS00394.09.03 LCE AUTHORIZATION - BREAKERS		21.0	31-Aug-2020	29-Sep-2020		
A2750	Review and approve Outage Sequence Document (Sign-off) Breakers	1.0	31-Aug-2020	31-Aug-2020	A2930	A3270
A1730	LCE Review TOA / Applications (Pred=TOA#,Dwgs and Const Plan, has T18.01 successor Breakers	1.0	29-Sep-2020	29-Sep-2020	A3350, A2930	AT0409
WBS: CS00394.09.04 TEST ACTIVITIES - BREAKERS		25.0	29-Jul-2020 A	30-Dec-2020		
A3270	N/R (per DL 7/28/2LCE Oversight of Testing Contractor (LOE, from start of mobilization up to execution of t	0.0	29-Jul-2020 A	29-Jul-2020 A	A2750, A3300	CFM- Breakers
A3260	Mobilize Test Prior to Construction Breakers	2.0	24-Nov-2020*	25-Nov-2020	A2930	A3280
A3280	Test & Execute test plan Breakers Breakers	23.0	27-Nov-2020	30-Dec-2020*	A3260	CFM- Breakers
WBS: CS00394.10 PROJECT CLOSE OUT		62.0	22-Jun-2020 A	31-Mar-2021		
WBS: CS00394.10.01 Civil As-Builts		27.0	08-Jan-2021	17-Feb-2021		
DSSE-860	Eversource Engineering Verifies Civil Mark Up As-Built Drawing Package	10.0	08-Jan-2021	22-Jan-2021	DSSE-900, DS	DSSE-970
DSSE-970	Eversource Engineering Updates Civil As-Built Drawing Package	5.0	25-Jan-2021	29-Jan-2021	DSSE-860	DSSE-870
DSSE-870	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	10.0	01-Feb-2021	12-Feb-2021	DSSE-970	DSSE-880, DSSE
DSSE-1120	Complete TD-176 CIVIL Design Prep & Issue As-Built Dwgs	1.0	16-Feb-2021	16-Feb-2021	DSSE-870	DSSE-880
DSSE-880	PM to Document Civil As-Built Drawings Complete	1.0	17-Feb-2021	17-Feb-2021	DSSE-870, DS	
WBS: CS00394.10.02 Electrical As-Builts Breakers		55.0	12-Jan-2021	31-Mar-2021		
DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package Breakers	10.0	12-Jan-2021	26-Jan-2021	DSSE-1100, DS	DSSE-940
DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package Breakers	5.0	27-Jan-2021	02-Feb-2021	DSSE-820	DSSE-830
DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field Break	10.0	03-Feb-2021	17-Feb-2021	DSSE-940	DSSE-1110, DSSE
DSSE-1110	Complete TD-176 ELECTRICAL Design Prep & Issue As-Built Dwgs Breakers	30.0	18-Feb-2021	31-Mar-2021	DSSE-830	FINISH
DSSE-840	PM to Document Electrical As-Built Drawings Complete Breakers	1.0	18-Feb-2021	18-Feb-2021	DSSE-830	FINISH

Activity ID	Activity Name	REM DUR	Start	Finish	Predecessors	Successors
WBS: CS00394.10.03 P&C As-Builts		5.0	08-Jan-2021	14-Jan-2021		
DSSE-950	P&C Submits SDS As-Builts	5.0	08-Jan-2021	14-Jan-2021	DSSE-1100	FINISH
WBS: CS00394.10.04 Test Closout		5.0	31-Dec-2020	07-Jan-2021		
A3290	LCE Review Test Data and Issue Commissioning Report (tie to As-Built submit Print activity) Breakers	5.0	31-Dec-2020	07-Jan-2021	CFM- Breakers	DSSE-910
WBS: CS00394.10.05 SITE RESTORATION CLOSEOUT		0.0	22-Jun-2020 A	22-Jun-2020 A		
A1110	N/R Restore / Remediate Site	0.0	22-Jun-2020 A	22-Jun-2020 A	CFM- Breakers	FINISH
WBS: CS00394.10.06 MATERIAL, EQUIPMENT, COST, AND ASSET MANAGEMENT CLOSEOUT		40.0	31-Dec-2020	01-Mar-2021		
A1020	Cost Analyst Prepares FINAL Units of Property	30.0	31-Dec-2020	12-Feb-2021	CFM- Breakers	FINISH
A1030	Asset Management Complete Asset Update(s) in CASCADE	30.0	15-Jan-2021	01-Mar-2021	A1260, CFM- Bı	FINISH
WBS: CS00394.10.07 PROJECT MANAGEMENT CLOSEOUT		62.0	31-Dec-2020	31-Mar-2021		
A1040	PM Prepares Closeout Documentation, Lessons Learned Meeting, etc.	30.0	31-Dec-2020	12-Feb-2021	CFM- Breakers	FINISH
DSSE-1100	Complete TD-707 Turnover Document / Forward to SOC & Mailing List	5.0	31-Dec-2020	07-Jan-2021	CFM- Breakers	DSSE-950, DSSE
FINISH	Project / Work Order Complete (FINAL SCHEDULE TASK/MILESTONE)	0.0		31-Mar-2021	A1020, DSSE-1	