EVERSOURCE

Operations Project Authorization Form

Approved at August 19, 2020 EPAC
Link to Meeting Minutes

Date Prepared: 07/13/2020	**Project Title: High Impedance Ground Fault Detection -** [redacted]
Company: Eversource CT	**Project Number: CS00362**
Organization: Protection & Controls Engineering	**Class(es) of Plant: D SS**
Project Initiator: [redacted]	**Project Category: Stations - Relays**
Project Manager: Nick [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Project Purpose: Evaluation of High Impedance Ground Fault Detection Systems**
Estimated in service date: March 2021	**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: $618K	**☐ PTF ☐ non-PTF ☒ Distribution**

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This project will install three [redacted]

This scope of work calls for the installation, test, and commissioning of one [redacted]. The total cost for the installation is $618K.

Equipment performance evaluation of events detected or occurring on the circuits monitored at the comparison sites will be performed by the Protection & Controls Engineering group in the corresponding state with assistances from the Operations and Distribution Engineering departments. The project will be held open after installation for a period of time (no longer than 12 months) to obtain assistance from the individual manufacturers and gain enough experience with the equipment to determine proper sensitivity settings and develop any algorithm changes necessary for optimal performance on the ES system. Eversource-wide performance evaluation of this technology will continue beyond the duration of this project and this location will continue to serve as a comparison site for future modifications developed by any of the manufacturers. Based upon ongoing performance evaluation of these devices, Protection and Controls Engineering will determine if and how this technology can be most effectively utilized on the ES system. A time frame for this decision cannot be determined at this time as it is highly dependent on frequency of events on the monitored circuits.

This project had $75K of initial funding for CT approved in PowerPlan on 12/22/2019. There has been a minimal amount spent to date on preliminary engineering and project development.

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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 Acquisition	$	$	$	$	$	$	$	$	$
2. Environmental Approvals / Permits	$	$	$	$	$	$	$	$	$
3. Outreach	$	$	$	$	$	$	$	$	$
4. Siting Approvals / Permits	$	$	$	$	$	$	$	$	$
5. Engineering / Design	$	$1	$51	$8	$	$	$	$	$61
6. Materials (Eversource purchased)	$	$	$	$22	$	$	$	$	$22
7. Construction (incl matl's by contractors)	$	$	$	$120	$	$	$	$	$120
8. Testing / Commissioning	$	$	$31	$86	$	$	$	$	$117
9. Project Mgmt Team	$	$	$2	$1	$	$	$	$	$3
10. Removals	$	$	$	$	$	$	$	$	$
11. Other	$	$	$	$	$	$	$	$	$
12. Risks	$	$	$	$31	$	$	$	$	$31
SUBTOTAL DIRECTS W/ RISKS	**$75**	**$1**	**$85**	**$267**	**$**	**$**	**$**	**$**	**$354**
13. Indirects/Overhead	$	$4	$70	$152	$	$	$	$	$225
14. AFUDC	$	$	$2	$6	$	$	$	$	$8
PROJECT TOTAL – BASELINE BUDGET	**$75**	**$5**	**$157**	**$424**	**$**	**$**	**$**	**$**	**$587**
15. Contingency	$	$	$8	$23	$	$	$	$	$31
TOTAL CAPITAL REQUEST	**$75**	**$5**	**$165**	**$447**	**$**	**$**	**$**	**$**	**$618**
16. Reimbursables/Customer Contribution	$	$	$	$	$	$	$	$	$
PROJECT TOTAL (LESS REIMBURSABLES)	**$75**	**$5**	**$165**	**$447**	**$**	**$**	**$**	**$**	**$618**
O&M	$	$	$	$	$	$	$	$	$
TOTAL REQUEST	**$75**	**$5**	**$165**	**$447**	**$**	**$**	**$**	**$**	**$618**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

Other costs: None

Risk costs:

- $15K – Delay during construction and possible overtime.
- $8K – Programming Errors during testing and commissioning
- $8K – Design development due to unfamiliar relays

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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	$	$1	$6	$6	$	$	$	$	$13
OT Labor	$	$	$	$	$	$	$	$	$
Outside Services Labor	$	$	$78	$209	$	$	$	$	$287
Materials*	$	$	$	$22	$	$	$	$	$22
Removals	$	$	$	$	$	$	$	$	$
Other	$	$	$8	$54	$	$	$	$	$62
Indirects	$	$4	$70	$152	$	$	$	$	$225
AFUDC	$	$	$2	$6	$	$	$	$	$8
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$75**	**$5**	**$165**	**$447**	**$**	**$**	**$**	**$**	**$618**

*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: No future costs

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: No

Technical Justification:

Project Need Statement

Eversource leadership has asked the engineering groups in all three (3) states to explore the high-impedance ground fault detection technologies presently available on the market and evaluate whether any viable methods exists to securely detect and subsequently clear high impedance faults on the Eversource distribution system.

This full funding request for $618K will install [redacted]

The project will be held open after installation for a period of time (no longer than 12 months) to obtain assistance from the individual manufacturers and gain enough experience with the equipment to determine proper sensitivity settings and develop any algorithm changes necessary for optimal performance on the ES system. Eversource-wide performance evaluation of this technology will continue beyond the duration of this project and this location will continue to serve as a comparison site for future modifications developed by the any of the manufacturers.

Depending upon the performance result of these [redacted] A time frame for such a decision cannot be determined at this time, as it is highly dependent upon the frequency of events which occur on the monitored circuits. Should a device(s) be selected for broad deployment on the ES system, it would be included in Eversource protection philosophies for distribution feeder protection under a potential future program and potentially become part of a procedure that will specifically address high-impedance ground fault response.

Additional maintenance should not be required for the equipment added during this project, as each device will be tested whenever sensitivity settings are made or manufacturer firmware setting modifications are applied.

Project Objectives

The project objective is to determine if any of the chosen technologies can securely detect high impedance ground faults on the Eversource distribution system.

Project Scope

At the onset of this project six [redacted]

[redacted]

Background / Justification

In the past Eversource has evaluated the use of high impedance ground fault detection technologies. A request was sent to relay manufacturers in this most recent effort. There was a

total of [redacted]

Business Process and / or Technical Improvements

With this project Eversource will evaluate if the current selection of high impedance ground fault detection systems have improved from previous studies. Being able to compare these algorithms will give engineering the data needed to make a conclusion that adding such ability would benefit the Eversource system.

Alternatives Considered with Cost Estimates

This project is evaluating all viable alternatives on the market.

Project Schedule

Milestone/Phase Name	Estimated Date
EPAC Approval	August 2020
Major Material Delivery – Relays	October 2020
100% Engineering Completion	December 2020
Construction Start	February 2021
Testing/Commissioning	March 2021
In Service Date	March 2021

See Attachment C for the P6 schedule.

Regulatory Approvals

There will be no regulatory approvals needed for this project.

Risks and Risk Mitigation Plans

This primary risk to being in service on time would be the unfamiliarity with the relays being used. To make up for this, an additional $8K has been added to the estimate for the design development and $8K for the programming of the relays. This will make up for the additional manhours needed to familiarize the associated parties with these new relays. To make up for delays in construction or if overtime is needed, $15K will be added to the estimate. A total of $31K is being added to cover these risks.

Contingency

A 5% contingency of $31K was added to the estimate to account for any unexpected cost found during construction.

References

N/A

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

- Attachment A: Cost Estimate Backup Details
- Attachment B: Constructability Review Form
- Attachment C: P6 Schedule

INSTRUCTIONS:
It is the responsibility of the initiator to contact the subject matter experts in the listed area disciplines to determine if the project considerations contained in this list are applicable to their project. They should fill out the checklist and determine a transition plan for the purpose of project execution. See the PAF Guide for additional instruction.

Project Checklist - Transmission & Substation Capital Project					
Project Name: [redacted] - High Impedance Ground Fault Detection				**Project Number: CS00362**	
Facility Type: ☐ BPS ☐ BES ☐ PTF ☐ non-PTF ☐ CIP ☒ Distribution					
PLANNING					
Is a NX-9 required?				No	
Is an ISO-NE PAC presentation required?				No	
ISO-NE Presentation Date (if completed):				Enter Date	
Cost in ISO-NE Presentation ($M) (if completed):				Enter Cost ($M)	
Is a PPA required?				No	
Is a TCA Application Required?				No	
TCA Submittal Date (if submitted):				Enter Date	
Cost in TCA Submittal ($M) (if submitted):				Enter Cost ($M)	
Enter ISO-NE RSP / Asset Condition ID, if assigned:				Enter ISO-NE ID	
PLANNING/PROTECTION & CONTROLS					
Are RAS/SPS/UVLs affected?				No	
OPERATIONS					
Outage Required?	☒ Primary Equipment (Power Transfer)	☒ Secondary Equipment (P&C only)	☐ Outage Not Required		
Do SCLL Conditions Exist?				No	
Has an outage schedule been approved?				No	
Are Operations & Maintenance procedures/training required?				Yes	
STANDARDS					
Does the project include standard equipment and designs?				No	
SUBSTATION ENGINEERING					
Does this impact Revenue Metering				No	
Is preliminary short circuit/ breaker duty analysis required?				No	
Are there any changes to the baseline audible noise?				No	
Is there an impact to the existing ground grid?				No	
Is a Transient Over Voltage (TOV) analysis required?				No	

Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted] - High Impedance Ground Fault Detection	**Project Number: CS00362**

P&C ENGINEERING	
OP-22 - Are PMUs and DDR required?	No
If BPS, is an NPCC Directory #4 presentation required?	No
Are ISO-NE OP-24 Appendix B updates necessary?	No
TRANSMISSION LINE ENGINEERING	
Are there any changes that affect the baseline EMF?	No
Are there any changes that affect the baseline EMI?	No
SITING	
Is a Siting filing required? *(If yes, list in regulatory approvals section)*	No
PERMITTING	
Is there any permitting required? *(If yes, list in regulatory approvals section)*	No
SITING & CONSTRUCTION SERVICES (OUTREACH)	
What is the level of outreach expected?	None
INITIATOR	
Has a field constructability review been completed?	Yes
INVESTMENT RECOVERY	
Does the project require development of an Investment Recovery plan?	No
COST ESTIMATING	
What team/firm prepared the cost estimate?	Estimate was prepared by Eversource Engineering
Name of the person who prepared the estimate:	[redacted]
Was the estimate reviewed by Eversource Estimating?	Yes - Full Review

Cost Estimate Backup Details

Please see attachment A for detailed cost estimate.

ESTIMATE SUMMARY

Project Title: [redacted] High Imp. Ground Fault Detection
Project Mgr/Lead: [redacted]
Project Number:
WO & Task #: CS003621
Est. Revision # 00

Estimate By: [redacted]
Date of Estimate: 6/30/20
ISD:04/30/2021
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									
2	Environmental Approvals / Permits									
3	Outreach									
4	Siting Approvals / Permits									
5	Engineering / Design	$60,900	9.9%	$1,400	$51,300	$8,200				
6	Materials (Eversource purchased)	$21,600	3.5%			$21,600				
7	Construction (incl matl's by	$120,000	19.4%		$200	$119,800				
8	Testing / Commissioning	$116,900	18.9%		$31,200	$85,700				
9	PMT Project Mgmt Team	$3,300	0.5%		$2,200	$1,100				
10	Removals									
11	Other									
12	Risks	$31,000	5.0%			$31,000				
	Project Directs Total w/Risks	**$353,700**	57.3%	**$1,400**	**$84,900**	**$267,400**				
13	Indirects/Overhead	$225,400	36.5%	$3,600	$70,300	$151,500				
14	AFUDC	$7,700	1.2%		$2,200	$5,500				
	Project Total - Baseline Budget	**$586,800**	95.0%	**$5,000**	**$157,400**	**$424,400**				
15	Contingency	$30,800	5.0%		$7,800	$23,000				
	Project Total - Funding Approval Level	**$617,600**	100.0%	**$5,000**	**$165,200**	**$447,400**				
16	Reimbursables/Customer Contribution									
	Project Total (less reimbursables)	**$617,600**		**$5,000**	**$165,200**	**$447,400**				
	Amount of Escalation included above	$11,000				$11,000				
6	Total materials - Eversource	$21,600				$21,600				
	Total materials - Contractor	$200			$200					
	Total materials	$21,800			$200	$21,600				

NOTE: Risk / Contingency is 11.1% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)

Estimate Range	-25%	-	25%
	$463,000	-	**$772,000**

COMMENTS:

Project Scope:

[redacted]

Assumptions/Clarifications:
Indirect rates based on: [redacted] Station work

Assumptions:
- Contractor engineering
- Contractor construction
- Contractor test
- Prior authorization amount for this project is $75,000

RISKS

Delay/OT	$	15.000
Programming Errors	$	8.000
Design development	$	8.000

Project Number:

Project Title: [redacted] **High Imp. Ground Fault Detection**

Escalated Line Item Dollars

Project Number:
Date of Estimate: 8/30/25
Est. Revision # 00
Template Revision # 01.4

PAF (old)	Cover (old)	PAF (break	WBS	CSTXX-CONSTRUCTION	R		Prior actuals to date Mhrs	Prior actuals to date DOLLARS	2020 Mhrs	2020 DOLLARS	1 2021 Mhrs	2021 DOLLARS	2 2022 Mhrs	2022 DOLLARS	3 2023 Mhrs	2023 DOLLARS	4 2024 Mhrs	2024 DOLLARS	5 2025 Mhrs	2025 DOLLARS	TOTAL Mhrs	TOTAL DOLLARS
				Electrical Construction	LT																	
				General Construction	LT																	
				SCADA / Automation	LT																	
				Telecom - Field	LT																	
				Construction Reps (internal)	LT																	
				Support Switch/Tag	LT							$2,652										$2,652
				Other (specify)	LT																	
				Other (specify)	LT																	
				Other (specify)	LT																	
				LT Total								$2,652										$2,652
				Employee Expenses	AE	5%						$133										$133
				Construction Purchased Material	AM	1%						$795										$795
				Outside Construction Vendor	AQ							$79,516										$79,516
				Sales tax on Constr. Vendor																		
				Vehicles (now in Indirects section)	AV																	
				Inspection services (Outside Vendor)	AQ																	
				Construction Rep (Outside vendor)	AQ							$37,492										$37,492
				Rents and Leases	BR																	
				CSTXX Subtotal								$120,588										$120,588
				Escalation						$ -		$ -		$ -		$ -		$ -		$ -		$ -
					P1																	
				CSTXX Total								$120,588										$120,588
				ENRXX-TG ENGINEERING/DESIGN																		
				Project Services/Drafting	LT																	
				T- Line Engineering/Design	LT																	
				D- Street Engineering/Design	LT			$1,400														$1,400
				Civil Engineering/Design	LT																	
				Substation (T) Engineering/Design	LT																	
				Substation (D) Engineering/Design	LT					$1,030		$530										$1,560
				Protection & Controls Engineering	LT					$2,318		$1,327										$3,645
				Survey Engineering	LT																	
				SCADA / Automation Engineering	LT					$412												$412
				Telecom Engineering	LT					$412												$412
				Other - specify	LT																	
				Other - specify	LT																	
				LT Total				$1,400		$4,172		$1,857										$7,429
				Employee Expenses	AE	5%				$209		$93										$302
				Contractor Engineering - T-Lines	AQ																	
				Contractor Engineering - D-Street	AQ																	
				Contractor Engineering - T -Station	AQ																	
				Contractor Engineering - D-Station	AQ					$12,160		$3,131										$15,291
				Contractor Engineering - P&C	AQ					$27,540		$3,152										$30,692
				Contractor Engineering - Survey	AQ																	
				Contractor Engineering - SCADA / Automation	AQ					$3,600												$3,600
				Contractor Engineering - Telecom	AQ					$3,600												$3,600
				Contractor Engineering - Specify	AQ																	
				Contractor Engineering - Specify	AQ																	
				Contractor Engineering - Specify	AQ																	
				Vehicles (now in Indirects section)	AV																	
				ENRXX Subtotal			-	$1,400		$51,261		$8,233	-	-	-	-	-	-				$60,914
				Escalation																		
					P1																	
				ENRXX Total			-	$1,400		$51,261		$8,233	-	-	-	-	-	-				$60,914
				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																		
					P1																	
				LNDXX Total			-		-		-		-		-		-		-		-	
				MATXX-TG MATERIAL																		
				Eversource	AM							$19,996										$19,996
				Outside Services	AM					$188												$188
					AM																	
				Freight																		
				Sales Tax Eversource/outside services		4%						$812										$812
				Other																		
				MATXX Subtotal						$188		$20,808										$20,996
				Escalation																		
					P1																	
				MATXX Total						$188		$20,808										$20,996
				PSMXX-PROJECT MANAGER & SUPPORT																		
				Project Management (PM)	LT					$2,060		$1,061										$3,121
				Project Planning/Cost (P)	LT																	
				Contracts/Purchasing (C/P)	LT																	
				System Planning	LT																	
				Environmental	LT																	
				SCS - None	LT																	
				Legal	LT																	
				Estimating	LT																	
				Siting - None	LT																	
				Asset Management	LT																	
				Other -	LT																	
				Other -	LT																	
				Other -	LT																	
				LT Total						$2,060		$1,061										$3,121
				Employee Expenses	AE	5%				$103		$54										$157
				Project Support Vendor - PM	AQ					-		-		-		-		-		-		-
				Project Support Vendor - P	AQ					-		-		-		-		-		-		-
				Project Support Vendor - C/P	AQ					-		-		-		-		-		-		-
				Project Support Vendor - System Planning	AQ					-		-		-		-		-		-		-
				Project Support Vendor - Environmental	AQ					-		-		-		-		-		-		-
				Project Support Vendor - SCS - None	AQ					-		-		-		-		-		-		-
				Project Support Vendor - Legal	AQ					-		-		-		-		-		-		-
				Project Support Vendor - Estimating	AQ					-		-		-		-		-		-		-
				Project Support Vendor - Siting - None	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 GWP tax large proj. allowance	BR																	
					BR																	
				Fees and Payments - Environmental	BF																	
				Fees and Payments - Siting	BF																	
				Fees and Payments - Other	BF																	
				PSMXX Subtotal			-			$2,163		$1,115	-	-	-	-	-	-				$3,278
				Escalation																		
					P1																	
				PSMXX Total			-			$2,163		$1,115	-	-	-	-	-	-				$3,278
				REMXX-TG REMOVAL																		
				Engineering/Design	LT																	
				Internal Construction	LT																	
				LT Total																		
				Employee Expenses	AE	18%																
				Outside Services	AO																	
				Contractor Labor	AQ																	
				Vehicles (now in Indirects section)	AV																	
				Rents and Leases	BR																	
				REMXX Subtotal			-		-		-		-		-		-		-		-	
				Escalation																		
					P1																	
				REMXX Total			-		-		-		-		-		-		-		-	
				TSTXX-TG TEST																		
				Test / Field Engr. Labor (In House)	LT																	
				Lead Commissioning Engr. (LCE) (Internal)	AQ																	
				Employee Expenses	AE	10%																
				Test / Field Engr. Labor (contractor)	AQ							$53,560								250	$53,560	
				Lead Commissioning Engr. (LCE) (contractor)	AQ					$31,200		$32,136								300	$63,336	
				Vehicles (now in Indirects section)	AV																	
				TSTXX Subtotal						$31,200		$85,696										$116,896
				Escalation																		
					P1																	
				TSTXX Total						$31,200		$85,696								550	$116,896	
				SUBTOTAL PROJECT DIRECT COST			-	$1,400		$84,832		$236,440	-	-	-	-	-	-	-	1,904	$322,672	
				Risk																		
				Risk								$31,000										$31,000
				Risk Total								$31,000										$31,000
				TOTAL PROJECT DIRECT COST			-	$1,400	579	$84,832	1,325	$267,440	-	-	-	-	-	-	-	1,904	$353,672	
				INDIRECTS																		
				Non-Productive Time Allocation (ZB)	58	16.1%				$938		$938										$1,876
				Payroll Benefits Allocation (ZE) Incl NPT	59	44.0%						$1,343										$1,343
				Gen SVC CO Overhead (ZF) Incl NPT	60	80.0%				$5,736		$2,685										$8,421
				R&S Allocations (ZI)	61	60.0%		$3,600		$57,292		$132,626										$193,657
				AI&E Allocations (ZJ)	62	1.3%				$1,869		$4,660										$6,530
				Stores Expense Allocation (ZC)	62	7.4%						$1,522										$1,522
				Lobby Stock																		
				MDEC		3.0%				$2,740		$6,071										$8,811
				Vehicles		28.0%				$1,745		$1,559										$3,304
					63																	
				Indirects Subtotal				$3,600		$70,250		$151,523										$225,373
				TOTAL PROJECT COST - Direct & Indirect / excl AFUDC				$5,000		$155,082		$418,963										$579,045
				AFUDC																		
				AFUDC (ZK)						$2,194	0	$5,526	0	0	0		0		0	0	$7,720	
				In Service Dollars																		
				Cumulative ISS																		
				AFUDC Subtotal						$2,194		$5,526										$7,720
				TOTAL PROJECT COST - Baseline Budget				$5,000		$157,276		$424,489										$586,765
				Contingency																		
				Contingency						$7,758		$22,996										$30,754
				Other																		
				Contingency SubTotal						$7,758		$22,996										$30,754
				TOTAL PROJECT COST - Approved Funding				$5,000		$165,034		$447,484										$617,518
				Reimbursables / Customer Contribution																		
				Reimbursables / Customer Contribution (enter as negative)																		
					59																	
				TOTAL PROJECT COST				$5,000		$165,034		$447,484										$617,518

10/23/2025 8:18 AM

EVERSOURCE
Constructability Review Form

Submit a PDF copy of this signed form to TranEPAC@eversource.com along with the PAF

Project Number(s): CS00362	**Project Title:** High Impedance Ground Fault Detection: [redacted]
Date of Constructability Review: 06/16/2020	

Constructability Review Team: *list below the department and names of all who participated in the constructability review walkdown*

Lead*	Department**	Name and Title
☒	Project Management	[redacted]
☒	Protection & Controls Engineering	
☒	Construction	
☐		

*Check the box of the individual who coordinated/led the constructability review
**List names from any other departments who attended the constructability review, add additional rows to the table if necessary

Observations/Findings/Scope Review/Risks Identified:
list below the outcome of the constructability review.

The walk down and constructability review for the High Impedance Ground Fault Detection, [redacted] took place on June 16th, 2020. [redacted]

All meeting participants followed substation safety protocols and were wearing the proper safety and fire rated clothing and gear required for the Substation environment.

The meeting was coordinated by Stephen Conroy of Eversource Transmission Project Management, with key Eversource personnel from Construction and Engineering.

Observations:

- The goal of the constructability review was to determine an approach for installing the selected technologies that will assist with comparative evaluation.

- Key areas of the station's equipment that were observed consisted of the inside and outside of the station's panels to determine space availability for the install of relays and test devices.

Findings:

[redacted]

Scope Review:

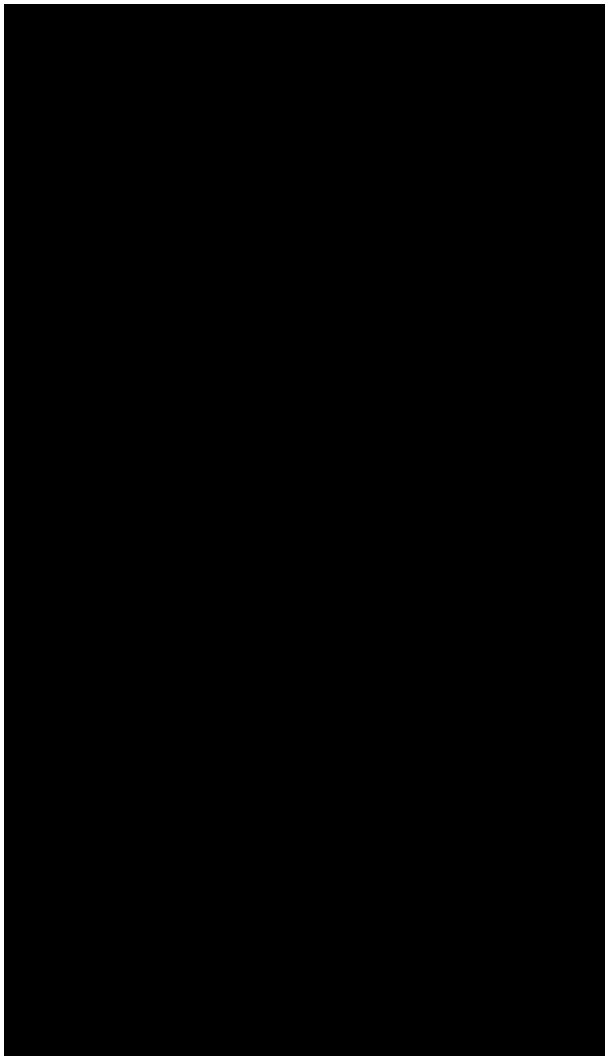
The following items were reviewed for the scope at [redacted]:

Substation Protection & Controls Scope:

[redacted]

EVERSOURCE

Constructability Review Form



The Construction Services Supervisor, Engineer lead, or Project Manager must sign below.

[redacted] July 28th, 2020

Signature *Date*

Activity ID	Activity Name	Start	Finish	Original Duration	Predecessors	Successors	Resources	Activity Flag
HighImpedance	**High Impedance Ground Fault Detection**	01-Aug-19 A	20-Oct-21	366d				
HighImpedance.01	**INITIALIZATION AND SCOPE DEVELOPEMENT**	01-Aug-19 A	15-Feb-21	192d				
HighImpedance.01.12	**T-Minus Milestones**	29-May-20 A	15-Feb-21	160d				
HighImpedance.01.12.02	**Electrical T-Milestones**	29-May-20 A	15-Feb-21	160d				
BT0301	N/RB-T-03.01 NX-9 Ratings to LCC & ISO for Existing Equipment (EM=Per Procedure/15 business days before [		29-May-20 A	0d	NX9A-EM34			
BT3001	B-T-30.01 - Eng. Project Scoping Document Issued (Scope Lockdown)		19-Jun-20 A	0d	PE1720	BT00		
BT2605	B-T-26.05 - 30% Design / Engineering Completed		26-Aug-20	0d	PE1100, PE1400, PE1500	BT00		
BT0801	B-T-08.01 Permits Approved / Received		31-Aug-20	0d	PI1620	BT00		
BT0602	B-T-06.02 - Units of Property (Items) Issued to Plant Accounting		03-Sep-20	0d	A22610	BT00		
BT1801	B-T-18.01 Submit TOA Request to Start Construction		29-Sep-20*	0d	DSSE-1051	BT00		
BT0401	B-T-04.01 Final Material Receipt Review Completed *ES Purchased*		16-Oct-20	0d	DSSE-520, DSSE-550, DSSE-560, DSSE-1101, DSSE-1091, DSSE-1111, DSSE-1121, DSSE-1131	BT00		
BT1811	B-T-18.11 - 70% Design/Engineering Completed		16-Nov-20	0d	DSSE-205	BT00		
BT0805E	B-T-08.05E - IFC - Electrical (AG) w/BOM		08-Dec-20	0d	DSSE-240	BT00		
BT0814	B-T-08.14 Construction Contracts / PSA in Place		20-Jan-21	0d	A2270	BT00		
BT00	B-T-00 Construction Start (Electrical) (TOA # 20-XXXXXX)	15-Feb-21*		0d	BT0401, BT0602, BT0805E, BT1801, BT2605, BT1811, BT3001, BT0814, BT1201, BT0801, BT1202, BT0805P, BT0901, BT0404	DSSE-CST1, DSSE-CST21, DSSE-CST31, DSSE-CST		
HighImpedance.01.12.06	**P&C T-Minus Milestones**	23-Jul-20	03-Dec-20	91d				
BT0901	B-T-09.01 - Protection System Data - OP-24 Requirement		23-Jul-20	0d	DSSE-490	BT00		
BT0404	B-T-04.04 - All Relay Protective Settings Issued		23-Oct-20	0d	DSSE-1141	BT00		
BT0805P	B-T-08.05P IFC - P&C w/BOM		23-Oct-20	0d	DSSE-1141	BT00		
BT1202	B-T-12.02 - P/C Description / Draft OI Issued		16-Nov-20	0d	DSSE-450, DSSE-470, DSSE-930	BT00		
BT1201	B-T-12.01 SCADA Data (Tab) Sheets Sent to LCC		03-Dec-20	0d	DSSE-220	BT00		
HighImpedance.01.12.08	**LCE T-Milestones**	01-Sep-20	21-Sep-20	14d				
C2404	C-24.04 Determine /Assign Lead Commissioning Engineering	01-Sep-20	01-Sep-20	1d	A22550			
C1301	C-13.01 Commissioning Plan Complete	21-Sep-20	21-Sep-20	1d	A22570			
HighImpedance.01.00	**Initial Funding**	01-Aug-19 A	05-Mar-20 A	20d				
PI1200	Project Initiator Develop Intitial Funding Request	01-Aug-19 A	15-Aug-19 A	10d		PI1000		
PI1300	Initial Funding Request Approved	13-Nov-19 A	13-Nov-19 A	10d	PI1000	PI1400, PI1630		EPAC-I
PI1000	Submit Initial Funding Request		13-Nov-19 A	0d	PI1200	PI1300		
PI1630	Create Work Order(s) in PowerPlan	14-Nov-19 A	14-Nov-19 A	1d	PI1300	PI1400		
PI1400	Assign Project Manager	14-Nov-19 A	14-Nov-19 A	1d	PI1300, PI1630	PI1600, PI1500, PE1700, PE1701		PM-AM
PI1500	Assign Scheduler	05-Mar-20 A	05-Mar-20 A	5d	PI1400			
PI1600	Assign Cost Analyst	05-Mar-20 A	05-Mar-20 A	1d	PI1400			
HighImpedance.01.09	**Project Initiation**	29-May-20 A	26-Aug-20	66d				
HighImpedance.01.09.09	**NOSDC.Program Level & First Project PAF**	29-May-20 A	01-Jun-20 A	61d				
PE1610	Review Conceptual Siting & Permitting (None Required per AM)	29-May-20 A	29-May-20 A	0d	PE1701	ATCGE1011		
PE2070	ES Engineering Develop Preliminary Scope for Funding for All Engineering Disciplines	29-May-20 A	29-May-20 A	15d	PE1700, PE1701	ATCGE1011		ES-30%
ATCGE1011	Develop At lease Conceptual Grade Estimate (-25/+50%) (already completed per Brian D. 05.29.20)	29-May-20 A	29-May-20 A	15d	PE1610, PE2070	PAFP1001, PF1001		EST-FL
PAFP1001	Submit Program Level & First Projects PAF for Internal Review (already completed per Brian D. 05.29.20)	29-May-20 A	29-May-20 A	10d	ATCGE1011	PAFP1101		
PAFP1101	Incorporate Internal Review Comments & Submit Program Level & Firat Projects PAF to EPAC for Review	29-May-20 A	29-May-20 A	5d	PAFP1001	PAFP1201		
PAFP1201	Incorporate EPAC Program Level & First Projects PAF Review Comments (already completed per Brian D. 05.29	29-May-20 A	29-May-20 A	5d	PAFP1101	PF1001		PAF Su
PF1001	EPAC Program Level & First Projects PAF Approval (already completed per Brian D. 05.29.20)	29-May-20 A	29-May-20 A	0d	ATCGE1011, PAFP1201	A22600		EPAC-I

Activity ID	Activity Name	Start	Finish	Original Duration	Predecessors	Successors	Resources	Activity Flag
PE1701	N/R (Per MC 06.01.20)Conduct Conceptual Constructability Walk Down - Oswald WMA	01-Jun-20 A	01-Jun-20 A	5d	PI1400, PE1700	PE1610, PE2070	[redacted]	
PE1700	N/R(Per MC 06.01.20)Conduct Conceptual Constructability Walk Down - Farmington CT	01-Jun-20 A	01-Jun-20 A	5d	PI1400	PE1701, PE2070		
HighImpedance.01.09.10 NOSDC.Release Level		01-Jun-20 A	01-Jun-20 A	0d				
HighImpedance.01.09.10.1 NOSDC.Release Level Release #1		01-Jun-20 A	01-Jun-20 A	0d				
A22600	Begin Release # 1 Engineering	01-Jun-20 A		0d	PF1001	PE2100, PE1710		
HighImpedance.01.09.02 Electrical Engineering 30% Design		06-Aug-20	26-Aug-20	15d				
PE1100	ES Engineering Develop Electrical Substation Preliminary Engineering Design in Accordance with Deliverables Checklist	06-Aug-20	26-Aug-20	15d	FF1000	BT2605, DSSE-520, DSSE-1111, DSSE-200, A22540, DSSE-400, PI1210		ES-30%
HighImpedance.01.09.06 P&C Engineering 30% Design		06-Aug-20	26-Aug-20	15d				
PE1400	ES Engineering Develop P&C Preliminary Engineering Design in Accordance with Deliverables Checklist	06-Aug-20	26-Aug-20	15d	FF1000	BT2605, DSSE-510, DSSE-1071, DSSE-200, DSSE-400, PI1210		ES-30%
HighImpedance.01.09.07 Communication Engineering 30% Design		06-Aug-20	26-Aug-20	15d				
PE1500	ES Engineering Develop Communications Preliminary Engineering Design in Accordance with Deliverables Chec	06-Aug-20	26-Aug-20	15d	FF1000	BT2605, DSSE-200, DSSE-400, PI1210		ES-30%
HighImpedance.01.09.2 EPAC Full Funding		08-Jun-20 A	19-Aug-20	48d				
PE2090	Conduct Preliminary Constructability Walk Down -Farmington CT	08-Jun-20 A	10-Jun-20 A	3d	PE1710	DE1600, PE2100, PE1720		
PE1710	Create Engineering Preliminary Scope Document	08-Jun-20 A	15-Jun-20 A	5d	A22600	PE2090, PE2100		
PE1720	Finalize Engineering Scope Document	16-Jun-20 A	19-Jun-20 A	4d	PE2090, PE2100	DE1600, BT3001		Scope (
PE2100	Conduct Preliminary Constructability Walk Down - Oswald WMA	22-Jun-20 A	24-Jun-20 A	3d	PE2090, PE1710, A22600	DE1600, PE1720, DE1700		
DE1600	Create Planning Grade Estimate (+/-25% Full Funding)	25-Jun-20 A	30-Jun-20 A	5d	PE1720, PE2090, PE2100, DE1700	FF1000, PAFP1000, OP221000, OP241000		
PAFP1000	Submit Full Funding PAF for Internal Review	08-Jul-20 A	15-Jul-20 A	6d	DE1600	PAFF1100		
OP221000	OP-22 Go/No-Go Pre PAF	20-Jul-20	20-Jul-20	1d	DE1600	FF1000		
OP241000	OP-24 Go/No-Go Pre PAF (If Not Required, N/R this Act. and Continue with the Process)	20-Jul-20	20-Jul-20	1d	DE1600	DSSE-480, FF1000		
DE1700	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM)	20-Jul-20	24-Jul-20	5d	PE2100	DE1600		
PAFF1100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Engineering	20-Jul-20	24-Jul-20	5d	PAFP1000	PAFF1200		
PAFF1200	Incorporate EPAC Full Funding PAF Review Comments	27-Jul-20	31-Jul-20	5d	PAFF1100	FF1000		
FF1000	EPAC Full Funding Approval		05-Aug-20*	0d	DE1600, PAFF1200, OP221000, OP241000	PE1500, PE1100, PE1400, FF1010, DSSE-1050		EPAC-P
FF1010	Create Additional Work Orders in PowerPlan (Required)	06-Aug-20	19-Aug-20	10d	FF1000	DSSE-200, DSSE-400, PI1210		
HighImpedance.03 PROJECT MANAGEMENT		03-Sep-20	03-Sep-20	1d				
A22610	PM/Engr/Con Rep/Cost Analyst Develop Prelim UOP List(s) (T6 prior to last T-0)	03-Sep-20	03-Sep-20	1d	DSSE-510, DSSE-520, DSSE-1071, DSSE-1111	BT0602		
HighImpedance.04 ENVIRONMENTAL APPROVALS & PERMITS		27-Aug-20	31-Aug-20	3d				
HighImpedance.04.01 State Approval & Permits		27-Aug-20	31-Aug-20	3d				
HighImpedance.04.01.01 Advisory Board (PURA)		27-Aug-20	31-Aug-20	3d				
PI1210	PURA - Prepare PURA Methods & Manner Documentation for Submital	27-Aug-20	27-Aug-20	1d	FF1010, PE1400, PE1100, PE1500	PI1610		
PI1610	PURA - Submit PURA Application	28-Aug-20	28-Aug-20	1d	PI1210	PI1620		
PI1620	PURA -Send PURA Notification (30 days before start of Construction)	31-Aug-20	31-Aug-20	1d	PI1610	BT0801		
HighImpedance.05 ENGINEERING & DESIGN		29-May-20 A	08-Dec-20	191d				
HighImpedance.05.02 Electrical Engineering		02-Oct-20	08-Dec-20	45d				
DSSE-200	Detail (70%) Electrical Design Package Design	02-Oct-20	30-Oct-20	20d	DSSE-410, PE1100, PE1400, PE1500, FF1010	DSSE-205, A2200		ES-70%
DSSE-205	Detail (70%) Electrical Design Package Drafting	02-Nov-20	16-Nov-20	10d	DSSE-200	DSSE-210, BT1811, A2200		ES-70%
DSSE-460	Operating Instructions - SSED Review Draft Distribution OI	09-Nov-20	16-Nov-20	5d	DSSE-440, DSSE-450, DSSE-1141			
DSSE-920	Operating Instructions - SSED Review Draft Convex OI	09-Nov-20	16-Nov-20	5d	DSSE-440, DSSE-450, DSSE-1141			
DSSE-210	100% Electrical Design Package IFR	17-Nov-20	01-Dec-20	10d	DSSE-205	DSSE-220, DSSE-230, DSSE-240		ES-100
DSSE-230	Electrical Engineering - BOM Complete	02-Dec-20	03-Dec-20	2d	DSSE-210			

Activity ID	Activity Name	Start	Finish	Original Duration	Predecessors	Successors	Resources	Activity Flag
DSSE-240	Electrical Engineering - Electrical Package IFC (Physical & Electrical)	02-Dec-20	08-Dec-20	5d	DSSE-210	BT0805E, DSSE-CST, A22591	[redacted]	ES-IFC
HighImpedance.05.03 Distribution Thermal Ratings NX-9		29-May-20 A	29-May-20 A	136d				
NX9A-EM34	N/R(ML)Scheduler @ NURS email "Submitted for DOE Monitoring" - Updates T-3, EquipDOE, Revs DOE per M7	29-May-20 A	29-May-20 A	1d		BT0301		
NX9A-EM04	N/R(Per ML 05.29.20)LTRC Reviews and Makes "GO / NO-GO" Decision for 1-Line Nomenclature	29-May-20 A	29-May-20 A	5d				
NX9A-EM10	N/R(Per ML 05.29.20)LTRC Reviews and Makes "GO / NO-GO" Decision for Thermal Ratings - Requiring NX-9	29-May-20 A	29-May-20 A	5d				
HighImpedance.05.03.05 Non NX-9 Thermal Ratings		29-May-20 A	29-May-20 A	20d				
NX9A-EM44	N/R(Per ML 05.29.20)P&C Develops and Provides LTRC with P&C Checklist & Thermal Ratings Data	29-May-20 A	29-May-20 A	5d		NX9A-EM54		
NX9A-EM74	N/R(Per ML 05.29.20)LTRC Files Capability Sheets	29-May-20 A	29-May-20 A	5d	NX9A-EM64			** KPI **
NX9A-EM64	N/R(Per ML 05.29.20)TRC Reviews and Approves Thermal Rating Data	29-May-20 A	29-May-20 A	5d	NX9A-EM54	NX9A-EM74		
NX9A-EM54	N/R(Per ML 05.29.20)LTRC Prepares and Sends Thermal Rating Data for TRC Review	29-May-20 A	29-May-20 A	5d	NX9A-EM44	NX9A-EM64		
HighImpedance.05.04 P&C Engineering		21-Jul-20	03-Dec-20	94d				
DSSE-400	Prepare & Issue P&C Design Package to Drafting	27-Aug-20	17-Sep-20	15d	FF1010, PE1400, PE1100, PE1500	DSSE-410		ES-70%
DSSE-410	Drafting Prepare & Issue Back to P&C	18-Sep-20	01-Oct-20	10d	DSSE-400	DSSE-200, DSSE-440, DSSE-1141		
DSSE-450	Operating Instructions - Prepare and Issue Draft Distribution OI to Engineering	26-Oct-20	06-Nov-20	10d	DSSE-440, DSSE-1141	DSSE-470, DSSE-930, DSSE-460, DSSE-920, BT1202		
DSSE-470	Operating Instructions - P&C Review Draft Distribution OI	09-Nov-20	16-Nov-20	5d	DSSE-440, DSSE-450, DSSE-1141	BT1202		
DSSE-930	Operating Instructions - P&C Review Draft Convex OI	09-Nov-20	16-Nov-20	5d	DSSE-440, DSSE-450, DSSE-1141	BT1202		
DSSE-220	SDS Complete	02-Dec-20	03-Dec-20	2d	DSSE-210	BT1201		ES-IFC
HighImpedance.05.04.01 Relay Settings		02-Oct-20	23-Oct-20	15d				
DSSE-440	Relay Settings - Prepare and Issue Relay Settings IFC	02-Oct-20	16-Oct-20	10d	DSSE-410	DSSE-470, DSSE-460, DSSE-930, DSSE-920, DSSE-450, DSSE-1141		ES-IFC
DSSE-1141	Relay Settings - Peer Review of Relay Settings IFC	19-Oct-20	23-Oct-20	5d	DSSE-410, DSSE-440	DSSE-470, DSSE-460, DSSE-930, DSSE-920, DSSE-450, BT0404, BT0805P		ES-IFC
HighImpedance.05.04.02 OP-24		21-Jul-20	23-Jul-20	3d				
DSSE-480	P&C Validation of PAF OP-24 Go/No-Go	21-Jul-20	21-Jul-20	1d	OP241000	DSSE-540		
DSSE-540	P&C Updates OP-24 Appendix B & Notify Craig Marien	22-Jul-20	22-Jul-20	1d	DSSE-480	DSSE-490		
DSSE-490	P&C Submits OP-24 Appendix B to ISO-NE	23-Jul-20	23-Jul-20	1d	DSSE-540	BT0901		
HighImpedance.06 MATERIAL		27-Aug-20	16-Oct-20	35d				
HighImpedance.06.1 P&C Material		27-Aug-20	16-Oct-20	35d				
DSSE-510	Prepare & Issue DR for P&C Material (ABB) (tie to 30% P&C)	27-Aug-20	02-Sep-20	5d	PE1400	DSSE-530, A22610, A22592		DR-ENG
DSSE-1071	Prepare & Issue DR for P&C Material (GE) (tie to 30% P&C)	27-Aug-20	02-Sep-20	5d	PE1400	DSSE-1081, A22610, A22592		DR-ENG
DSSE-530	Issue PO for P&C Material (ABB)	03-Sep-20	10-Sep-20	5d	DSSE-510	DSSE-1091		
DSSE-1081	Issue PO for P&C Material (GE)	03-Sep-20	10-Sep-20	5d	DSSE-1071	DSSE-1101		
DSSE-1091	P&C Material Manufacture and Delivery (ABB)	11-Sep-20	16-Oct-20	25d	DSSE-530	BT0401		
DSSE-1101	P&C Material Manufacture and Delivery (GE)	11-Sep-20	16-Oct-20	25d	DSSE-1081	BT0401		
HighImpedance.06.2 Elecrical Material		27-Aug-20	14-Sep-20	12d				
DSSE-520	Prepare & Issue DR for Misc Substation Material (Oswald)	27-Aug-20	02-Sep-20	5d	PE1100	DSSE-550, BT0401, A22610		DR-ENG
DSSE-1111	Prepare & Issue DR for Misc Substation Material (Famington)	27-Aug-20	02-Sep-20	5d	PE1100	DSSE-1121, BT0401, A22610		DR-ENG
DSSE-550	Issue PO for Misc Substation Material (Oswald)	03-Sep-20	10-Sep-20	5d	DSSE-520	BT0401, DSSE-560		M-DELIV
DSSE-1121	Issue PO for Misc Substation Material (Famington)	03-Sep-20	10-Sep-20	5d	DSSE-1111	BT0401, DSSE-1131		M-DELIV
DSSE-1131	Misc. Material Manufacture and Delivery (Famington)	11-Sep-20	11-Sep-20	1d	DSSE-1121	BT0401		
DSSE-560	Misc. Material Manufacture and Delivery (Oswald)	11-Sep-20	14-Sep-20	2d	DSSE-550	BT0401		
HighImpedance.07 CONSTRUCTION		22-Sep-20	22-Mar-21	123d				
HighImpedance.07.02 Electrical Construction		17-Nov-20	15-Feb-21	60d				
HighImpedance.07.02.06 Electrical Construction Service/Contracts		17-Nov-20	20-Jan-21	43d				

Activity ID	Activity Name	Start	Finish	Original Duration	Predecessors	Successors	Resources	Activity Flag
A2200	Prepare Specifications / Scope of Work (Electrical Contractor)	17-Nov-20	18-Nov-20	2d	DSSE-200, DSSE-205	A2210		
A2210	Prepare and Issue RFP (Electrical Contractor)	19-Nov-20	25-Nov-20	5d	A2200	A2220		
A2220	Bid Period (Electrical Contractor)	27-Nov-20	17-Dec-20	15d	A2210	A2230		
A2230	Evaluate Bids and Develop Short List (Electrical Contractor)	18-Dec-20	24-Dec-20	5d	A2220	A2240, A22640		
A2240	Negotiate Contract (Electrical Contractor)	28-Dec-20	04-Jan-21	5d	A2230	A2250		
A2250	Award contracts for Electrical Construction and Testing Services (Electrical Contractor)	05-Jan-21	05-Jan-21	1d	A2240	A2260		
A2260	Issue DR for Construction Contractor (Electrical Contractor)	06-Jan-21	12-Jan-21	5d	A2250	A2270		
A2270	Issue PO to Construction Contractor (Electrical Contractor)	13-Jan-21	20-Jan-21	5d	A2260	DSSE-CST01, BT0814		
HighImpedance.07.02.07 Contractor Mobilzation/Construction Start		21-Jan-21	15-Feb-21	17d				
DSSE-CST	Contractor Mobilization for Electrical	21-Jan-21	21-Jan-21	1d	A2270	ISD, DSSE-910, Finish, DSSE-CST1		
DSSE-CST	Construction Start Milestone	15-Feb-21		0d	BT00, DSSE-240	ISD, DSSE-910, Finish, DSSE-CST1		SOC
HighImpedance.07.02.2 TOA 20-XXXXX - NRA		22-Sep-20	22-Mar-21	123d				
DSSE-1050	Outage Request - Determine Outage Date Requirements	22-Sep-20	28-Sep-20	5d	FF1000	DSSE-1051		
DSSE-1051	Outage Request - Request Outage Dates (18 weeks before outage)	29-Sep-20	29-Sep-20	0d	DSSE-1050	BT1801		
DSSE-CST1	Switching Off for Equipment Installation	16-Feb-21	16-Feb-21	1d	BT00, DSSE-CST, DSSE-CST01	DSSE-CST2, DSSE-T001		
DSSE-T001	D-TOA Outage End to End Testing	16-Feb-21	19-Mar-21	24d	DSSE-CST1	DSSE-CST3, DSSE-909, DSSE-929		
DSSE-CST2	Install High Impedance Fault Detection Relay Equipment	16-Feb-21	19-Mar-21	24d	DSSE-CST1	DSSE-CST3		
DSSE-CST3	Switching On	22-Mar-21	22-Mar-21	1d	DSSE-T001, DSSE-CST2	Finish		
HighImpedance.07.10 Construction Support		16-Feb-21	22-Mar-21	25d				
DSSE-CST2	Engineering Support to Construction	16-Feb-21	22-Mar-21	25d	BT00	Finish		
DSSE-CST3	Construction Rep Support	16-Feb-21	22-Mar-21	30d	BT00	Finish		
HighImpedance.07.09 ISD (In Servcie Date)		22-Mar-21	22-Mar-21	0d				
ISD	EQUIPMENT IN SERVICE DATE (requires FOOB constraint)		22-Mar-21*	0d	Finish, DSSE-CST, DSSE-CST01, A22620	DSSE-910		ISD
Finish	Construction Finish Milestone		22-Mar-21	0d	DSSE-CST3, DSSE-CST21, DSSE-CST31, D	ISD		
HighImpedance.10 TEST AND COMMISSION		27-Aug-20	08-Mar-21	130d				
A22540	PM Requests Lead Commissioning Engineer- Go/No-Go "GO"	27-Aug-20	27-Aug-20	1d	PE1100	A22550, A22560		
A22550	Assign Lead Commissioning Engineer	28-Aug-20	31-Aug-20	2d	A22540	C2404		
A22560	Procure Services of Testing Contractor or Internal Test Group	28-Aug-20	03-Sep-20	5d	A22540	A22570		
A22592	Respond to Construction Questions	03-Sep-20	17-Sep-20	10d	DSSE-510, DSSE-1071	A22593		
A22570	Develop test and commissioning plan	04-Sep-20	18-Sep-20	10d	A22560	A22590, A22580, C1301		
A22593	Issue As-Bulit ISD Drawing Set	18-Sep-20	01-Oct-20	10d	A22592			
A22580	LCE Reviews and Accepts test and Commissioning Plan	21-Sep-20	02-Oct-20	10d	A22570	A22590		
A22590	Evaluate drawings and plan for construction outages	21-Sep-20	02-Oct-20	10d	A22570, A22580			
A22591	Place Drawings (Non-P&P) into ADEPT	09-Dec-20	15-Dec-20	5d	DSSE-240			
A22640	Mobilize commissioning engineer and testing vendor prior to construction	28-Dec-20	29-Dec-20	2d	A2230	A22650		
A22620	Execute Test Plan	16-Feb-21	08-Mar-21	15d	A22650	ISD		
A22650	Oversight of testing contractor (LOE, from start of mobilization up to execution of the test plan)	30-Dec-20	08-Mar-21	46d	A22640	A22620		
HighImpedance.11 PROJECT CLOSE OUT		22-Mar-21	20-Oct-21	150d				
DSSE-910	Test Group Prepare Electrical Field Mark Ups (Tie after ISD)	23-Mar-21	24-Mar-21	2d	ISD, DSSE-CST, DSSE-CST01	DSSE-820, DSSE-960, DSSE-950		
DSSE-929	Construction Rep Provide Equipment Replacement Form (ERF) Document	22-Mar-21	02-Apr-21	10d	DSSE-T001	DSSE-909		
DSSE-909	Asset Ctrl Update CASCADE & Post Doc for Cost & Engineering	05-Apr-21	16-Apr-21	10d	DSSE-T001, DSSE-929	DSSE-899		
DSSE-899	Cost Analyst Balance Materials, Prepare UOP and submit to Engineer for Review	19-Apr-21	23-Aug-21	90d	DSSE-909	DSSE-919, DSSE-1030		
DSSE-919	Engineering Review of UOP	24-Aug-21	21-Sep-21	20d	DSSE-899	DSSE-1030		
DSSE-1020	Schedule Finish Milestone		20-Oct-21	0d	DSSE-1030, DSSE-840, DSSE-1061			
DSSE-1030	Asset Management Process Final UOP	22-Sep-21	20-Oct-21	20d	DSSE-899, DSSE-919	DSSE-1020		
HighImpedance.11.02 Electrical As-Builts		25-Mar-21	23-Apr-21	22d				

Activity ID	Activity Name	Start	Finish	Original Duration	Predecessors	Successors	Resources	Activity Flag
DSSE-820	Eversource Engineering Verifies Electrical Mark Up As-Built Drawing Package	25-Mar-21	07-Apr-21	10d	DSSE-910	DSSE-940	[redacted]	
DSSE-940	Eversource Engineering Updates Electrical As-Built Drawing Package	08-Apr-21	12-Apr-21	3d	DSSE-820	DSSE-830		
DSSE-830	ES Create Transmittal, Approve Final As-Built Package, and EDC Files and Issue Drawings to Field	13-Apr-21	22-Apr-21	8d	DSSE-940, DSSE-960, DSSE-950	DSSE-840		ES-ASB
DSSE-840	PM to Document Electrical As-Built Drawings Complete	23-Apr-21	23-Apr-21	1d	DSSE-830	DSSE-1020		
HighImpedance.11.03 P&C As-Builts		25-Mar-21	01-Apr-21	6d				
DSSE-950	P&C Submits SDS As-Builts	25-Mar-21	31-Mar-21	5d	DSSE-910	DSSE-830, DSSE-1061		
DSSE-960	P&C Submits Relay Setting As-Builts	25-Mar-21	31-Mar-21	5d	DSSE-910	DSSE-830, DSSE-1061		
DSSE-1061	PM to Document Electrical As-Built Drawings Complete	01-Apr-21	01-Apr-21	1d	DSSE-960, DSSE-950	DSSE-1020		