EVERSOURCE

Supplement Authorization Form

Project Title: TDRP 2020 – [redacted]	Project Number: CD01685
Date Prepared: 04/29/2026	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** TRMSN DISTR RELIABILTY PERFRM
Initiating Organization: Distribution	**Project Type:** Specific
Project DDE: [redacted]	**Capital Investment part of 5-year plan?** Yes
Project Manager: [redacted]	**Emergency Related Request?** No
Project Sponsor: [redacted]	**Facility Type** (check all that apply)**:** ☐ PTF ☐ non-PTF ☒ Distribution ☐ N/A (General Plant)
Current Authorized Amount: $310k	**Approved In-Service Date:** 12/31/22
Supplement Request: $118.9k	**Estimated In-Service Date:** 12/31/22
Total Capital Request: $428.9k	**Authorization Type:** Supplement Request
	Reason: Cost Overage

1. Project Background

Eversource Transmission-Distribution Reliability Performance (TDRP) Projects address reliability issues associated with the Worst Performing Top 100 Circuits in Connecticut. In doing so, Eversource maintains compliance with PURA Docket 86-12-03. Eversource is required to report the status of the actions taken to improve performance for each circuit topping the "Worst 100" list. Updates are required each year consecutively for a total of four years following a circuit's appearance on the list.

In 2020, the [redacted] Circuit was ranked 17th due to tree related outages. Several segments were identified to mitigate the tree-related issues. The preferred option is estimated to cost $320K saving $0.98/CM and consists of segments 1,2,10 and 11.

- The proposal includes creation of additional sectionalizing by installing a new smart switch, [redacted] 4100, downstream of [redacted]-72S recloser to create smaller customer zones of 271/250.
- Installing a new smart switch, [redacted]-4002 downstream of the [redacted]-4001 recloser, which creates an 86/3 customer zone and reduces the exposure to 86 customers from outages occurring within a 3-mile right-of-way
- Replace 3-100K cutouts with a triple single recloser, [redacted]-360R, to reduce outages due to trees and to coordinate with installed downstream trip savers.

- Reconductor one phase of a single-phase delta zone on [redacted] beyond Pole 1 to mitigate the vulnerability of the 3,000 feet zone due to heavy vegetation.

2. Supplement Justification Overview

This supplement is required due to the direct costs increasing due to material and outside services.

3. Supplement Justification Detail

Contractors completed this project and additional material was required.

4. Supplement Cost Summary (Project Total)

Line-item Category	To Date Spend Year(s)	Prior Authorized Year(s)	Variance (Supplemental Request) Year(s)	New Total Request (Add Prior Authorized and Variance) Year(s)
Internal Labor and Construction Equipment	2.9	16.0	-13.4	2.6
Outside Services	168.6	136.0	12.9	148.9
Materials	130.2	47.0	68.0	115.0
Removals	0.0	0.0	32.7	32.7
Risk and Contingency	8.4	0.0	8.4	8.4
Other	-22.2	1.0	-20.6	-19.6
SUBTOTAL DIRECTS W/ RISKS	**287.9**	**200.0**	**87.9**	**287.9**
Indirect / Overhead (including benefits)	138.3	108.0	30.3	138.3
AFUDC	2.7	2.0	0.7	2.7
Subtotal – Indirect Costs	**141.0**	**110.0**	**31.0**	**141.0**
TOTAL CAPITAL REQUEST	**428.9**	**310.0**	**118.9**	**428.9**
Reimbursables/Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
PROJECT TOTAL (LESS REIMBURSABLES)	**428.9**	**310.0**	**118.9**	**428.9**

New Total Request by Year (if applicable)

Note: If multi-year project, include actuals for current and years past, and then show forecasted spend for upcoming years.

Line-item Category	2022	2023	2025	Total
Internal Labor and Construction Equipment	2.8	0.0	-0.2	2.6
Outside Services	161.4	0.0	-12.5	148.9
Materials	124.7	0.0	-9.6	115.0
Removals	34.2	0.0	-1.6	32.7
Risk and Contingency	0.0	0.0	8.4	8.4
Other	-21.3	0.0	1.6	-19.6
SUBTOTAL DIRECTS W/ RISKS	**301.8**	**0.0**	**-13.8**	**287.9**
Indirect / Overhead (including benefits)	143.2	-4.7	-0.3	138.3
AFUDC	2.7	0.0	0.0	2.7
Subtotal – Indirect Costs	**145.9**	**-4.7**	**-0.3**	**141.0**
TOTAL CAPITAL REQUEST	**447.7**	**-4.7**	**-14.1**	**428.9**
Reimbursables/Customer Contribution	0.0	0.0	0.0	**0.0**
PROJECT TOTAL (LESS REIMBURSABLES)	**447.7**	**-4.7**	**-14.1**	**428.9**

5. Lessons Learned

Operations Project Authorization Form

Date Prepared: 04-28-2021	**Project Title: TDRP 2020 –** [redacted]
Company/ies: Eversource CT	**Project ID Number:CD01685**
Organization: Distribution Electric	**Class(es) of Plant: Distribution**
Project Initiator: [redacted]	**Project Category: Line**
Project Manager: [redacted]	**Project Type: TDRP**
Project Sponsor: [redacted]	**Project Purpose: Reliability Improvement Spec**
Estimated in service date: 12/31/2022	**If Transmission Project: PTF? N/A**
Eng. /Constr. Resources Budgeted? Y	**Capital Investment Part of Original Operating Plan? Y**
Authorization Type: Preliminary	**O&M Expenses Part of the Original Operating Plan? Y**
Total Request: $320K	

Financial Requirements:

Project Authorization
ERM: _____

FP&A: _____

Executive Summary

Eversource Transmission-Distribution Reliability Performance (TDRP) Projects address reliability issues associated with the Worst Performing Top 100 Circuits in Connecticut. In doing so, Eversource maintains compliance with PURA Docket 86-12-03. Eversource is required to report the status of the actions taken to improve performance for each circuit topping the "Worst 100" list. Updates are required each year consecutively for a total of four years following a circuit's appearance on the list.

In 2020, the [redacted] Circuit was ranked 17th due to tree related outages. Several segments were identified to mitigate the tree issues. The preferred option is estimated to cost $320K saving $0.98/CM and consists of segments 1,2,10 and 11.

- The proposal includes creation of additional sectionalizing by installing a new smart switch, [redacted]-4100, downstream of [redacted]-72S recloser to create smaller customer zones of 271/250.
- Installing a new smart switch, [redacted]-4002 downstream of the [redacted]-4001 recloser, which creates an 86/3 customer zone and reduces the exposure to 86 customers from outages occurring within a 3-mile right-of-way
- Replace 3-100K cutouts with a triple single recloser, [redacted]-360R, to reduce outages due to trees and to coordinate with installed downstream trip savers.

- Reconductor one phase of a single-phase delta zone on [redacted] beyond Pole 1 to mitigate the vulnerability of the 3,000 feet zone due to heavy vegetation.
- The areas that did not warrant a rebuild at this time, will be monitored and given to Vegetation Management to identify and address any danger trees.

Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2022	2023	2024	Totals
Capital Additions - Direct	$0	$182	$0	$0	$182
Less Customer Contribution	$0	$0	$0	$0	$0
Removals net of Salvage ____%	$0	$17	$0	$0	$17
Total - Direct Spending	$0	$199	$0	$0	$199
Capital Additions - Indirect	$0	$108	$0	$0	$108
Subtotal Request	$0	$308	$0	$0	$308
AFUDC	$0	$2	$0	$0	$2
Total Capital Request	$0	$310	$0	$0	$310
O&M	$0	$10	$0	$0	$10
Total Request	$0	$320	$0	$0	$320

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	Year 1	Year 2	Year 3+	Total
Straight Time Labor	$14	$0	$0	$14
Overtime Labor	$2	$0	$0	$2
Outside Services	$136	$0	$0	$136
Materials	$47	$0	$0	$47
Other, including contingency amounts (describe)	$1	$0	$0	$1
Total Direct Costs	**$199**	**$0**	**$0**	**$199**

Indirect Capital Costs	Year 1	Year 2	Year 3+	Total
Indirects/Overheads (including benefits)	$108	$0	$0	$108
Capitalized interest or AFUDC, if any	$2	$0	$0	$2
Total Indirect Costs	**$111**	**$0**	**$0**	**$111**
Total Capital Costs	**$310**	**$0**	**$0**	**$310**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Capital Project Costs	**$310**	**$0**	**$0**	**$310**
Total O&M Project Costs	**$10**	**$0**	**$0**	**$10**

Total Project Cost	**$ 320**	**$ -**	**$ -**	**$ 320**

Technical Justification (See Reliability Table):

- Segment 1 ([redacted]-72S): Install new Smart Switch, [redacted]-4100 on [redacted] to reduce a 521-customer zone into two (250/271 customers respectively) customer zones. This is estimated to cost $66K with a saving of $0.40/CM. This segment will improve reliability by reducing a large zone into 2 smaller zones reducing the impact of a fault on [redacted].

- Segment 2 (Pole 388): Install three single phase reclosers, [redacted]-360R, at Pole 338, [redacted], a 329-customer zone. This is estimated to cost $66K with a savings of $1.28/CM. This segment will improve reliability by preventing temporary faults from progressing to full customer outages.

- Segment 10 (Pole 1797): (Refer to Segment 5 attached below for conversion): Reconductor 1 phase of bare wire with 1/0 tree wire on [redacted] without converting (3,000ft). This is estimated to cost $121K with a savings of 1.37/CM. This segment will improve reliability by replacing bare wire, in a historically hot zone for tree related outages, with tree wire. The trees in this area are not tall or large, but this was predominately the cause of outages on the 20,000ft customer zone. The first 3,000ft of this zone appears to be where the tree caused outages are occurring.

- Segment 11 ([redacted]-4001): Replace the [redacted]-125 switch with smart switch [redacted]-4002. This work is estimated to cost $66K with a savings of $4.39/CM. This segment will improve reliability by preventing outages to 86 customers of an 89-customer zone. The zone is ~3-miles long and mostly Right-Of-Way. The 86 customers are located at the end of the 3-mile ROW.

Project Objectives

To improve the reliability of the [redacted] Circuit where numerous outages have been the main cause and have affected customers' service significantly.

Project Scope

- Install new smart switch, [redacted]-4100, on [redacted], a few sections [redacted] near Pole 7915.
- Replace three 100K cutouts at Pole 388, [redacted], with a triple single recloser ([redacted]-360R).
- Reconductor 1 phase of bare wire with 1/0 tree wire on [redacted] from Pole 1 to Pole 7172 (~3,000ft). Note: Replacement is for the bare phase located on top of the vertical Pole that serves as the tap for this line.
- Replace [redacted]-125 switch with smart switch, [redacted]-4002.

Major Material:

- 3,000 ft of 1/0 175mil Tree Wire
- Two Three Phase Reclosers
- One Triple Single Recloser

Background / Justification

[redacted] was last trimmed in 2019 and is scheduled to be trimmed in 2023 (see mapping of trimming history).

See CD01385 reliability by device for details (attached)

Segment	SEQ	Row Labels	Cum Count on Device	Count of Device	Sum of Customer Minutes	Customer Affecte	% cust affected	% CM
	2	SCADA_SR:1233[redacted]-70S	3	3	712,038	3,463	6%	15%
2	2A	FUSE_OH:338:34779368	8	5	732,982	1,256	5%	6%
	2B	3pOH[redacted]:112847544	9	1	293,360	190	2%	1%
3	2B1	FUSE_OH:164:34779282 [redacted]-1600F)	17	8	397,045	416	2%	3%
	2C	3P_RR:220[redacted]-1601F	18	1	222,816	132	2%	1%
4	2C1	FUSE_OH:1678:203988086	24	6	237,600	198	1%	2%
4	2D	FUSE_OH:1737:34774942	31	7	223,766	247	1%	2%
	3	SCADA_SR:7270[redacted]-71S	5	2	170,517	1,101	5%	1%
	4	SCADA_VS:235[redacted]-4000	9	4	357,431	1,497	3%	7%
9 & 12	4A	FUSE_OH:1797:34776409	16	7	475,695	1,256	5%	4%
	4B	FUSE_OH:834:34776236	22	5	98,650	50	0%	1%
5 or 10	4A1	FUSE_OH:1:158321252 & FUSE_OH:6844:158321187	23	7	885,310	761	3%	7%
6	4A1A	FUSE_OH:1910:34242495	32	9	558,432	567	2%	5%
7	4A1A1	FUSE_OH:5140:34243530	42	10	179,980	241	1%	1%
11	5	SCADA_VS:7590[redacted]-4001	26	9	201,404	368	2%	2%
1	6	SCADA_SR:35[redacted]-72S	6	3	2,223,107	1,563	18%	7%
	6A	FUSE_OH:1769:34257726	10	4	213,877	68	2%	0%

Business Process and / or Technical Improvements:

Improving the reliability of [redacted] Circuit.

Alternatives/Segments Considered:

The following segments were not selected at this time taking into consideration the cost/benefit analysis performed:

- Segment 3 (21P4-1600F): Reconductor and convert 4,400ft of single phase #4 Cu on [redacted]. This work is estimated to cost $300k with a savings of $6.78/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.
- Segment 4 (Pole 1737): Reconductor 4,000ft of single phase bare #2 Wire on [redacted], North Stonington, a heavily forested road with 89 Customers. This work is estimated to cost $255k with a savings of $10.19/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.
- Segment 5 (Pole 1 & Pole 6884): Reconductor and convert 3,000ft of single phase 447 & 631 conductor on [redacted], a 149-customer zone near [redacted], North Stonington. This is estimated to cost $268k with a savings of $3.04/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.
- Segment 6 (Pole 1910): Reconductor and convert 5,000ft of single phase #4 and #2 bare wire on [redacted], North Stonington, a heavily forested road of 61 Customers. This work is estimated to cost $353k with a savings of $6.32/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.
- Segment 7 (Pole 5140): Reconductor and convert 3,500ft of Single Phase #4 and #2 bare wire within a 26-customer backyard feed on [redacted]. This work is estimated to cost $244k with a savings of $13.58/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.
- Segment 9 (Pole 1797): Reconductor, 20,000ft of single phase #2 bare wire on [redacted], which is a 228-customer zone. This work is estimated to cost $1,004k with a savings of $18.76/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.

- Segment 12: (Pole 1797): Reconductor 9,500ft of three phase #2 bare wire with 1/0 tree wire from Pole 1796 to Pole 714. This is estimated to cost $401K with a savings of 7.49/CM; however, system rebuild is not warranted at this time, hazard tree removals will be performed, and we will continue to monitor performance.

Segment	Estimated Cost	% Improvement Customer minutes	Total Customer Minutes Over 4 Years			Cust in Zone	Number of Events Over 4 Years			% Improve Cust Interrupt	Total Number of Customers Interrupted Over 4 Years			Cost per customer minute		
			Non-Storm	Storm	Both		Non-Storm	Storm	Both		Non-Storm	Storm	Both	Non-Storm	Storm	Both
Segment 1 [redacted]-725 (Install [redacted]-4100)	$ 66,339.00	30%	30,739	2,192,368	2,223,107	520	1	2	3	0%	521	1,042	1,563	$ 28.78	$ 0.40	$ 0.40
Segment 2: p338 (Install [redacted]-360R)	$ 66,339.00	30%	15,648	673,060	688,708	329	1	3	4	0%	326	789	1,115	$ 56.53	$ 1.31	$ 1.28
Segment 10: p#1& p6844 [redacted] - Extend one phase of 1/O TW	$ 121,236.29	40%	23,808	861,502	885,310	142	2	5	7	55%	264	497	761	$ 50.92	$ 1.41	$ 1.37
Segment11 [redacted]-4001. Replace [redacted]-125 with [redacted]-4002	$ 66,339.00	30%	62,101	139,303	201,404	89	7	2	9	0%	269	99	368	$ 14.24	$ 6.35	$ 4.39
Preferred Option 1	**$ 320,253.29**	**33%**	**132,296**	**3,866,233**	**3,998,529**		**11**	**12**	**23**	**14%**	**1,380**	**2,427**	**3,807**	**$ 29.79**	**$ 1.02**	**$ 0.99**
Segment 12: p1797 [redacted] - Reconductor Bare #2 with 1/0 TW (9,500ft)	$ 400,575.55	45%	80,508	395,187	475,695	229	2	5	7	50%	141	100	241	$ 44.23	$ 9.01	$ 7.49
Segment 3 [redacted]-1600F,p164, [redacted]) - Recon/Convert	$ 299,723.87	45%	12,467	380,753	393,220	50	4	3	7	50%	208	156	364	$ 213.70	$ 7.00	$ 6.78
Segment 4:p1737 [redacted] - Recon p1672 to p902)	$ 255,026.00	45%	14,609	207,910	222,519	45	4	2	6	50%	127	91	218	$ 155.17	$ 10.90	$ 10.19
Segment 6: p1910 [redacted] - Recon/Convert)	$ 353,045.86	40%	36,792	521,640	558,432	61	3	6	9	55%	189	378	567	$ 95.96	$ 6.77	$ 6.32
Segment 7: p5140 (ROW off [redacted] - Recon /Convert)	$ 244,415.90	40%	29,705	150,275	179,980	26	7	3	10	55%	141	100	241	$ 82.28	$ 16.26	$ 13.58
Segment 9: Reconductor 20,000ft of [redacted]	$ 1,003,983.36	45%	80,508	395,187	475,695	229	2	5	7	50%	141	100	241	$ 110.85	$ 22.58	$ 18.76
Segment 5: p#1 &p#6844 [redacted] & [redacted], Reconductor and Covert 3000ft	$ 268,934.18	40%	23,808	861,502	885,310	142	2	5	7	55%	23,808	23,808	23,808	$ 112.96	$ 3.12	$ 3.04
Option 2	**$ 3,024,721.72**	**43%**	**386,885**	**5,917,185**	**6,304,070**		**33**	**36**	**69**	**41%**	**25,871**	**26,663**	**28,726**	**$ 72.17**	**$ 4.72**	**$ 4.43**

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Preliminary Approval	06-01-21
Detail Engineering	9-1-21
Final Approval	9-15-21
Material Ordered	9-20-21
Request Setting Changes	10-1-21
Poles Set as needed	12-1-21
Construction Starts	1-1-22
Construction Ends	10-1-22
Conversion	11-15-22

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation

Actual cost higher than estimated due to scope changes.	2022	Medium	Included contingency costs in the funding request. Perform detailed Field Analysis and walk down in project development to avoid potential issues.
Customer Permission / Siting Council / Municipal approvals	2022	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach
Internal construction resources not available to perform the work.	2022	High	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Internal engineering resources not available to perform the work.	2022	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Storm delays	2022	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2022	Low	Schedule work to minimize system abnormal time. Most of this work will require system to be abnormal for any extended period of time.

References

CD01685 PAF Calculator.xlsm

CD01685 Load Summary.pdf

CD01685 Reliability by Device rev1.pdf

CD01685 Need Statement.pdf

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

Visio-[redacted] Map of Proposals.pdf

Visio-[redacted] Outage Map.pdf

Visio-Tree Trimming Map.pdf

Visio-[redacted] PC&E oneline.pdf