EVERSOURCE

Supplement Authorization Form

Project Title: Eversource CT – 2020 TripSaver Program	Project Number: CD01436
Date Prepared: 05/01/2026	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** RELIABILITY IMPROVE SPEC PROJ
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: $1,142k	**Approved In-Service Date:** 12/31/2020
Supplement Request: $264k	**Estimated In-Service Date: 1/25/2021**
Total Capital Request: $1,406k	**Authorization Type:** Supplement Request
	Reason: Cost Overage

1. Project Background

Project CD01436 proposes to install TripSavers at 100 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

A TripSaver is a self–powered, electronically controlled, single–phase, cutout–mounted vacuum interrupter recloser. The TripSaver is designed to eliminate the sustained interruption that occurs when a lateral fuse cutout operates in response to a transient fault. It also has the ability to eliminate momentary circuit interruptions that occur when a substation circuit breaker or source–side line recloser would otherwise trip to prevent a lateral fuse cutout from operating in response to a transient fault.

The supplemental request for this project is $264K and the original capital request for this project was $1,142K, bringing the total capital request to $1,406K or a 23% increase from the full funding request.

2. Supplement Justification Overview

The overall material cost came in much higher than expected.

3. Supplement Justification Detail

The majority of the material cost overage was due to the individual TripSaver cost increases. Additionally, 12 poles needed to be replaced due to clearance issues.

4. Supplement Cost Summary (Project Total)

Line-item Category	To Date Spend	Prior Authorized	Variance (Supplemental Request)	New Total Request (Add Prior Authorized and Variance)
Internal Labor and Construction Equipment	59.4	102.0	-47.2	54.8
Outside Services	151.8	404.0	-264.0	140.0
Materials	655.1	156.0	448.1	604.1
Removals	0.0	0.0	67.3	67.3
Risk and Contingency	27.4	0.0	27.4	27.4
Other	-1.8	4.0	-5.7	-1.7
SUBTOTAL DIRECTS W/ RISKS	**891.9**	**666.0**	**225.9**	**891.9**
Indirect / Overhead (including benefits)	506.3	465.0	41.3	506.3
AFUDC	7.8	11.0	-3.2	7.8
Subtotal – Indirect Costs	**514.1**	**476.0**	**38.1**	**514.1**
TOTAL CAPITAL REQUEST	**1,406.1**	**1,142.0**	**264.1**	**1,406.1**
Reimbursables/Customer Contribution	0.0	0.0	0.0	0.0
PROJECT TOTAL (LESS REIMBURSABLES)	**1,406.1**	**1,142.0**	**264.1**	**1,406.1**

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	Year 2020	Year 2021	Total
Internal Labor and Construction Equipment	54.7	0.2	54.8
Outside Services	139.6	0.4	140.0
Materials	602.4	1.8	604.1
Removals	64.8	2.4	67.3
Risk and Contingency	0.0	27.4	27.4
Other	-1.7	0.0	-1.7
SUBTOTAL DIRECTS W/ RISKS	**859.8**	**32.2**	**891.9**
Indirect / Overhead (including benefits)	496.0	10.3	506.3
AFUDC	8.3	-0.5	7.8
Subtotal – Indirect Costs	**504.3**	**9.9**	**514.1**
TOTAL CAPITAL REQUEST	**1,364.0**	**42.0**	**1,406.1**
Reimbursables/Customer Contribution	0.0	0.0	**0.0**
PROJECT TOTAL (LESS REIMBURSABLES)	**1,364.0**	**42.0**	**1,406.1**

5. Lessons Learned

Future statewide projects, utilizing new technology, should have additional contingency included to account for potential material cost increases.

6. Full Funding PAF

Operations Project Authorization Form

Date Prepared: 11/05/2019	**Project Title:** Eversource CT – 2020 TripSaver Program
Company/ies: Eversource CT	**Project ID Number:** CD01436
Organization: Distribution Engineering	**Class(es) of Plant:** Distribution
Project Initiator: [redacted]	**Project Category:** Reliability
Project Manager: [redacted]	**Project Type:** TripSaver Program
Project Sponsor: [redacted]	**Project Purpose:** Improve reliability on fused circuit laterals.
Estimated in service date: 12/31/2020	**If Transmission Project: PTF?** N/A
Eng. / Constr. Resources Budgeted? Yes	**Capital Investment Part of Original Operating Plan?** Yes
Authorization Type: Preliminary Funding	**O&M Expenses Part of the Original Operating Plan?** Yes
Total Request: $1,200,000	

Financial Requirements:

Project Authorization
ERM: _____

FP&A: _____

Executive Summary

Project CD01436 proposes to install TripSavers at 100 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

A TripSaver is a self−powered, electronically controlled, single−phase, cutout−mounted vacuum interrupter recloser. The TripSaver is designed to eliminate the sustained interruption that occurs when a lateral fuse cutout operates in response to a transient fault. It also has the ability to eliminate momentary circuit interruptions that occur when a substation circuit breaker or source−side line recloser would otherwise trip to prevent a lateral fuse cutout from operating in response to a transient fault.

Based on previous years results, it is projected that the number of permanent outage events and the Customer Minutes Interrupted (CMI) will be reduced by approximately 70% on the fused laterals that are selected. (See table in the Background / Justification section of the PAF document.)

The Preliminary Funding request of $1.2M is based on the Eversource CT TripSaver Program Round 2 and Round 4 actual charges (see table below). Average cost per location is estimated at $12K.

Row Labels	ACTUALS	# Phases	# Locations	Avg $ Per Location
Round 1	$ 1,751,894	232	124	$ 14,128
Round 2	$ 1,172,197	155	94	$ 12,470
Round 3	$ 2,770,872	345	198	$ 13,994
Round 4	$ 1,239,551	142	100	$ 12,396
Grand Total	**$ 6,934,514**	**874**	**516**	**$ 13,439**

Project Costs Summary
Note: Dollar values are in thousands

	Prior Authorized	2020	2021	2022+	Totals
Capital Additions - Direct	$0	$511	$0	$0	$511
Less Customer Contribution	$0	$0	$0	$0	$0
Removals net of Salvage ___%	$0	$155	$0	$0	$155
Total - Direct Spending	$0	$666	$0	$0	$666
Capital Additions - Indirect	$0	$465	$0	$0	$465
Subtotal Request	$0	$1,132	$0	$0	$1,132
AFUDC	$0	$11	$0	$0	$11
Total Capital Request	$0	$1,142	$0	$0	$1,142
O&M	$0	$58	$0	$0	$58
Total Request	$0	$1,200	$0	$0	$1,200

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	2020	2021	2022+	Total
Straight Time Labor	$83	$0	$0	$83
Overtime Labor	$19	$0	$0	$19
Outside Services	$404	$0	$0	$404
Materials	$156	$0	$0	$156
Other, including contingency amounts (describe)	$4	$0	$0	$4
Total Direct Costs	**$666**	**$0**	**$0**	**$666**

Indirect Capital Costs	Year 1	Year 2	Year 3+	Total
Indirects/Overheads (including benefits)	$465	$0	$0	$465
Capitalized interest or AFUDC, if any	$10	$0	$0	$10
Total Indirect Costs	**$476**	**$0**	**$0**	**$476**
Total Capital Costs	**$1,142**	**$0**	**$0**	**$1,142**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Capital Project Costs	**$1,142**	**$0**	**$0**	**$1,142**
Total O&M Project Costs	**$58**	**$0**	**$0**	**$58**
Total Project Cost	**$1,200**	**$0**	**$0**	**$1,200**

Technical Justification:

Project Need Statement

Project CD01436 proposes to install TripSavers at 100 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

Project Objectives

Reduce the number of permanent outages on 100 existing fused laterals. Improve overall system reliability. Reduce overall system CMI.

Project Scope

Install TripSavers at 100 fused lateral locations in Connecticut. TripSaver locations to be determined by the selection process described in the Business Process and / or Technical Improvements section of the PAF document.

Major Material

Approximately 175 TripSaver II devices. The specific number of 65K and 100K devices is to be determined (TBD).

Background / Justification

Based on previous year's results, it is projected that the number of permanent outage events and the Customer Minutes Interrupted (CMI) will be reduced by approximately 70% on the fused laterals that are selected.

Comparison of August YTD Data for Prior 4 Year Avg vs Post Construction (2019):

AUGUST YTD	PRIOR 4 YR PERIOD				PRIOR 4 YR AVG	POST CONSTR		
ES REPORTABLE	2015	2016	2017	2018	15-19	2019	REDUCTION	CHANGE
CUSTOMERS AFFECTED	9,914	21,331	10,989	12,269	13,626	3,626	10,000	-73%
# EVENTS	100	196	113	106	129	37	92	-71%
CMI	1,149,291	2,870,324	1,277,797	1,658,729	1,739,035	476,048	1,262,987	-73%

AUGUST YTD	PRIOR 4 YR PERIOD				PRIOR 4 YR AVG	POST CONSTR		
WITH STORMS	2015	2016	2017	2018	15-19	2019	REDUCTION	CHANGE
CUSTOMERS AFFECTED	11,293	29,067	13,776	28,010	20,537	5,795	14,742	-72%
# EVENTS	117	258	136	254	191	56	135	-71%
CMI	2,104,549	9,176,665	1,645,425	25,297,525	9,556,041	1,222,124	8,333,917	-87%

Business Process and / or Technical Improvements:

TripSaver is a self−powered, electronically controlled, single−phase, cutout−mounted vacuum interrupter recloser. This device is designed to eliminate the sustained interruption that occurs when a lateral fuse cutout operates in response to a transient fault. It also has the ability to eliminate momentary circuit interruptions that occur when a substation circuit breaker or source−side line recloser would otherwise trip to prevent a lateral fuse cutout from operating in response to a transient fault.

When a fault occurs downstream of the TripSaver it will open internally for a programmed (dead time) duration. After the dead time expires, the internal contact will close and test the condition of the line. If the fault was temporary and the fault is no longer present, the contact of the device remains closed and a permanent outage was averted.

[Refer to DSEM Section 10.43, TripSaver II General, in the References section of the PAF document.]

Trip Saver Selection Process:

Reliability Inputs:

Downstream fuse reliability data was factored into the selection process based on fuse size and fault current. If the fault current for a downstream fuse was lower than that identified in the table below, it was included in the selection process. The assumption is that the Trip Saver will save a fault at those locations in addition to at the fuse location where it is installed.

Fuse Size	Fault Current Limit
80K	1500A
65K	1300A
30K	600A

Reliability data includes events from TBD through TBD, including storms.
Cause codes = Tree, Animal, Lightning, Patrolled Nothing Found

Exclusions:

1. Locations already planned for 2020
2. Locations on the same tap of a 2020 location
3. Locations on same tap as a single phase recloser
4. Fuses directly on source side of a step transformer, or anywhere downstream
5. 4.8kV Fuses
6. Fuses GT 100K or less than 65K
7. GT 6300A Fault Current
8. Locations serving customers with a Rate class >= 50 (larger commercial/industrial)

Alternatives Considered with Cost Estimates

1. Do Nothing: 100 fused lateral locations in Connecticut will continue to experience outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

Project Option Comparison

Design Criteria	Option		
	1 – 2020 TripSaver Program		
Reduce number of outage events on 100 fused laterals.	X		
Improve system reliability.	X		
Reduce system CMI.	X		
Cost	$1.2M	$	$
Cost / CM Saved	$/CM	$/CM	$/CM
Cost / CI Saved	$/CI	$/CI	$/CI
Preferred Option	X		

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Preliminary Funding Approval	11/2019
Detail Design	3/2020
Full Funding Approval	4/2020
Construction Start	4/2020
Construction End	12/2020

Regulatory Approvals

Eversource CT – 2020 TripSaver Program.

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2020	Low	Included contingency costs in the funding request. Perform detailed Field Analysis and walk down in project development to avoid potential issues.
Internal construction resources not available to perform the work.	2020	Low	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.	2020	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Storm delays	2020	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2020	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

DSEM Section 10-43
TripSaverII General.p

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

CD01436_Project
Need Statement_Eve

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