Operations Project Authorization Form

Date Prepared: 12/09/2021	**Project Title:** Eversource CT – 2022 Trip Saver Program
Company/ies: Eversource CT	**Project ID Number:** CD01887 (fund from lateral reliability)
Organization: Distribution Electric	**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: 12/31/2022	**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: $847K	

Financial Requirements:

Project Authorization
ERM: _____

FP&A: _____

Executive Summary

Project CD01887 proposes to install TripSavers at 77 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 can 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.)

CD01887 is requesting Preliminary Funding of $847K for the Eversource CT 2022 TripSaver Program. Average cost per location is estimated at $11,000 and is based on program historical costs.

Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2022	2023	2024+	Totals
Capital Additions - Direct	$0	$483	$0	$0	$483
Removals net of Salvage ____%	$0	$45	$0	$0	$45
Total - Direct Spending	$0	$527	$0	$0	$527
Capital Additions - Indirect	$0	$287	$0	$0	$287
Subtotal Request	$0	$815	$0	$0	$815
AFUDC	$0	$6	$0	$0	$6
Total Capital Request	$0	$821	$0	$0	$821
O&M	$0	$26	$0	$0	$26
Total Request	$0	$847	$0	$0	$847

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	2022	2023	2024+	Total
Straight Time Labor	$36	$0	$0	$36
Overtime Labor	$7	$0	$0	$7
Outside Services	$360	$0	$0	$360
Materials	$123	$0	$0	$123
Other, including contingency amounts (describe)	$2	$0	$0	$2
Total Direct Costs	**$527**	**$0**	**$0**	**$527**

Indirect Capital Costs	2022	2023	2024+	Total
Indirects/Overheads (including benefits)	$287	$0	$0	$287
Capitalized interest or AFUDC, if any	$6	$0	$0	$6
Total Indirect Costs	**$293**	**$0**	**$0**	**$293**
Total Capital Costs	**$821**	**$0**	**$0**	**$821**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Capital Project Costs	**$821**	**$0**	**$0**	**$821**
Total O&M Project Costs	**$26**	**$0**	**$0**	**$26**
Total Project Cost	**$ 847**	**$ -**	**$ -**	**$ 847**

Technical Justification:

Project Need Statement

Project CD01887 proposes to install TripSavers at 77 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 77 existing fused laterals. Improve overall system reliability. Reduce overall system CMI.

Project Scope

Install tripSavers at 77 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

127 trips savers at 77 locations:

65k trip saver	40
100k trip saver	59
140k trip saver	28

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%

Outage summary for these 77 locations:



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 can 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 2019 through 2021, including storms.
Cause codes = Tree, Animal, Lightning, Patrolled Nothing Found

Exclusions:

1. Locations already planned for 2022
2. Locations on the same tap of a 2021 location or previous year location
3. Locations on same tap as a single phase recloser or another trip saver
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: 77 fused lateral locations in Connecticut will continue to experience outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Preliminary Funding Approval	12/2021
Detail Design	3/2022
Full Funding Approval	4/2022
Construction Start	4/2022
Construction End	12/2022

Regulatory Approvals

None

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2022	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.	2022	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.	2022	Low	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

DSEM Section 10-43
TripSaverII General.p

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

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2019-09-18 CT
TripSaver Program U