EVERSOURCE

Supplement Authorization Form

Project Title: Eversource CT Hot Line Clamp Replacement	**Project Number:** CD02296
Date Prepared: 02/13/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** Reliability Improvement Spec Proj
Project Initiator: [redacted]	**Project Type:** Specific
Initiating Organization: Distribution	**Capital Investment part of original Op 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: $1,549.4K	**Approved In-Service Date:** 12/31/23
Supplement Request: $1,070.5K	**Estimated In-Service Date: 12/31/23**
Total Capital Request: $2,619.9K	**Authorization Type:** Supplement Request
	Reason: Cost Overage

1. Project Background

Supplemental funding is being requested for this project. The total capital request is $2,619.9K which is $1,070.5K more than the current authorized amount of $1,549.4K.

Project CD02296 addressed 1701 locations on Eversource circuit backbones where hot line clamps were to be replaced throughout Connecticut. Backbones see significant loading on a circuit and the hot line clamp connections on backbones are known to fail under these conditions. Proactive replacement of these hot line clamp connectors with more robust wedge connectors can mitigate these outages. These locations were found using circuit patrols.

2. Supplement Justification Overview

The full funding request did not include the cost of stirrups in the unit cost for installing the hot line clamps. The unit cost for the stirrups increased the average cost for installing the hot line clamps to $802.70 per location. Had the stirrups been included in the estimate then the total partial funding estimate for the project would have been approximately $2.3M for these locations. There were also more locations that required multiple hot line clamps than anticipated. Locations that required multiple hot line clamps cost significantly more than locations that only required one.

3. Supplement Cost Summary (Project Total)

Financial Evaluation ($000's)

Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total Request
Internal Labor and Construction Equipment	1.3	1.3	0.0	1.3
Outside Services	1,167.9	687.6	480.4	1,167.9
Materials	32.6	32.4	0.2	32.6
Removals	262.0	163.9	98.2	262.0
Risk and Contingency	51.4	30.4	21.0	51.4
Other	0.0	0.0	0.0	0.0
Subtotal	**1,515.2**	**915.4**	**599.8**	**1,515.2**

Indirect Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total
Indirects/Overheads (including benefits)	1,104.7	634.0	470.7	1,104.7
Capitalized interest or AFUDC, if any	0.0	0.0	0.0	0.0
Subtotal	**1,104.7**	**634.0**	**470.7**	**1,104.7**
Total Capital Costs (Gross)	**2,619.9**	**1,549.4**	**1,070.5**	**2,619.9**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**2,619.9**	**1,549.4**	**1,070.5**	**2,619.9**

4. 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.

Capital Costs	2023	2024	TOTAL
Internal Labor & Equipment	0.6	0.6	1.3
Outside Services	579.5	588.5	1,167.9
Materials	16.2	16.4	32.6
Removals	130.0	132.0	262.0
Risk and Contingency	0.0	51.4	51.4
Other	0.0	0.0	0.0
SUBTOTAL Direct Cost	**726.3**	**788.9**	**1,515.2**
Indirects / Overheads	504.9	599.8	1,104.7
AFUDC	0.0	0.0	0.0
SUBTOTAL Indirect Cost	**504.9**	**599.8**	**1,104.7**
TOTAL Capital Request	**1,231.2**	**1,388.7**	**2,619.9**
Less Total Customer Contribution	0.0	0.0	**0.0**
TOTAL Project Cost	**1,231.2**	**1,388.7**	**2,619.9**

5. Lessons Learned

EVERSOURCE

Supplement Authorization Form

Project Title: Eversource CT Hot Line Clamp Replacement	**Project Number:** CD02296
Date Prepared: 02/13/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** Reliability Improvement Spec Proj
Project Initiator: [redacted]	**Project Type:** Specific
Initiating Organization: Distribution	**Capital Investment part of original Op 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)
Required in service date: 12/31/2023	
Total Capital Request: $1,549.4K	**Authorization Type:** Full Funding

Executive Summary

Project CD02296 addressed 1701 locations Eversource circuits backbones where hot line clamps were to be replaced throughout Connecticut. Full funding is being requested for this project at a cost of $1,549.4K, which is 217% of the approved partial funding of $715.4K. This is due to the following reasons:

The partial funding estimate did not account for the cost of "stirrups" in the unit cost for installing the hot line clamps. The unit cost for installing stirrups was $376.78 for single phase locations and $516.29 for three phase locations, while the unit cost for installing hot line clamps was $178.08 each. With the stirrups factored in, the average unit cost for installing hot line clamps and stirrups would be $802.70 per location and the total partial funding estimate for the project would have been approximately $2,326K including material and loaders (add 60%) for 1811 locations.

Only 1701 locations were visited under this project with 726 previously completed under project CD02169 Circuit Patrol Fixes. With this revised scope, the labor cost for the installations would have been: 726 X $442.32 + 975 X $802.70 = $1,103,757. Factoring in material and loaders, the partial funding estimate would have been $1,766K which is 113% of the final construction cost.

Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2023 Actual	2024 Actual	Total
Internal Labor and Construction Equipment	1.0	0.2	1.3
Outside Services	568.5	119.1	687.6
Materials	26.8	5.6	32.4
Removals	130.0	33.9	163.9
Risk and Contingency	0.0	30.4	30.4
Other	0.0	0.0	0.0
Subtotal	**726.3**	**189.1**	**915.4**

Indirect Capital Costs	2023 Actual	2024 Actual	Total
Indirects/Overheads (including benefits)	504.9	129.1	634.0
Capitalized interest or AFUDC, if any	0.0	0.0	0.0
Subtotal	**504.9**	**129.1**	**634.0**

Total Capital Costs (Gross)	**1,231.2**	**318.3**	**1,549.4**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**1,231.2**	**318.3**	**1,549.4**

Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

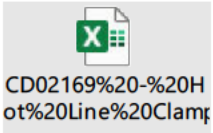
Circuit backbones usually see significant loading on a circuit, and hot line clamp connections on backbones are known to fail under these conditions. These failures usually cause outages to many customers. Pro-active replacement of these hot line clamp connectors with more robust wedge connectors can mitigate these outages.

b. Project Need

Circuit patrols revealed Hot Line Clamp connections on circuit backbone at 1,701 locations across Eversource CT territory. This non-standard connection needs to be pro-actively replaced to prevent outages to customers.

c. Project Scope

- Replace HLC connectors with wedge connectors at 1701 locations (See attached)



Alternatives Considered

These hotline clamps connectors could be left on the circuit backbones and replaced whenever they fail. This will cause customers to lose power until crews are dispatched to repair the fault. It is preferable to prevent outages to customers by pro-actively replacing these non-standard connections before they fail.

Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Partial Approval	July 2023
100% Detailed Engineering Completion	September 2023
Fully Funded	
Construction Start	October 2023
In Service Date	December 2023

Regulatory Decisions

N/A

Codes and Standards

N/A

Risk and Contingencies

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	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.	2023	High	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
System abnormal configuration	2023	Low	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.

References

References
1. N/A

Attachments (One Line Diagrams, Images, etc.)

Attachment	Included in Submittal?
A. Partial Funding PAF	*YES*

Attachment A: Partial Funding PAF

Operations Project Authorization Form

Project Title: Eversource CT Hot Line Clamp Repl.	Project Number: CD02296
Date Prepared: 07/19/2023	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** RELIABILITY IMPROVE SPEC PROJ
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** No
Estimated in service date: 12/31/2023	**Emergency Related Request?** No
Eng./Constr. Resources Budgeted? No	**Facility Type** (check all that apply)**:**
Total Gross Capital Request: $715.4K	**Authorization Type:** Partial Funding

Executive Summary

16,717 miles of Eversource's distribution circuits were patrolled and some locations were identified as having Hot Line Clamps connected directly to the backbone conductor. Partial funding is being requested at a cost of $715.4K to replace Hot Line Clamps on circuit backbones at 1,811 locations throughout Connecticut. Hot line clamps are prone to failure on circuit backbones, and as such these are being replaced with wedge connectors to rectify this non-standard connection.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	2023	2024	2025+	Total
Internal Labor and Construction Equipment	37.4	0.0	0.0	37.4
Outside Services	253.7	0.0	0.0	253.7
Materials	101.7	0.0	0.0	101.7
Removals	89.5	0.0	0.0	89.5
Other	3.5	0.0	0.0	3.5
Risk and Contingency	0.0	0.0	0.0	0.0
Subtotal	**485.7**	**0.0**	**0.0**	**485.7**

Indirect Capital Costs	2023	2024	2025+	Total
Indirects/Overheads (including benefits)	215.4	0.0	0.0	215.4
Capitalized interest or AFUDC, if any	14.2	0.0	0.0	14.2
Subtotal	**229.6**	**0.0**	**0.0**	**229.6**
Total Capital Costs (Gross)	**715.4**	**0.0**	**0.0**	**715.4**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net)	**715.4**	**0.0**	**0.0**	**715.4**

Technical Justification:

Project Need, Objective and Justification:

Circuit backbones usually see significant loading on a circuit, and hot line clamp connections on backbones are known to fail under these conditions. These failures usually cause outages to many customers. Pro-active replacement of these hot line clamp connectors with more robust wedge connectors can mitigate these outages.

Project Scope:

- Replace HLC connectors at 1,811 locations with wedge connectors (see attached)



CD02169%20-%20Hot%20Line%20Clamp

Major Material:

- 5,433 Wedge Connectors

Background:

Circuit patrols revealed Hot Line Clamp connections on circuit backbone at 1,811 locations across Eversource CT territory. This non-standard connection needs to be pro-actively replaced to prevent outages to customers.

Alternatives Considered:

Were alternative solutions considered/applicable? Include any cost/benefit analysis.

Alternatives were considered (please describe below)

These hotline clamps connectors could be left on the circuit backbones and replaced whenever they fail. This will cause customers to lose power until crews are dispatched to repair the fault. It is preferable to prevent outages to customers by pro-actively replacing these non-standard connections before they fail.

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

Project Schedule

Milestone/Phase Name	Estimated Date
100% Engineering Completion	September 2023
Construction Start	October 2023
In Service Date	December 2023

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	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.	2023	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.	2023	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
System abnormal configuration	2023	Low	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.

References



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

N/A