EVERSOURCE

Project Approval Form

Project Title: [redacted] Middletown	**Project Number: CD02059**
Date Prepared: 12/01/2023	**Company:** Eversource CT
Organization: Electric System Operations	**Project Category:** UG Network Automation
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: 12/2024	Town: [redacted]
Total Capital Request: $224.7K	**Authorization Type:** Full Funding

1. Executive Summary

This project was established to address the manual switchgear at [redacted] Middletown. This project proposes to replace [redacted] This proposal will automate 121 customers on [redacted].

The preferred feeder is the [redacted] and the alternate feeder is the [redacted] circuit. The [redacted] has the capacity to accept the automatic transfer from the [redacted] without causing overload (see attachment A – Project Load Summary).

This project is part of an overall program to eliminate manual switchgear in order to eliminate the need to manually transfer customers to their alternative source for loss of the preferred source.

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2024	Year 2	Year 3+	Total
Internal Labor and Construction Equipment	25.2	0.0	0.0	25.2
Outside Services	3.9	0.0	0.0	3.9
Materials	79.3	0.0	0.0	79.3
Removals	26.4	0.0	0.0	26.4
Risk and Contingency	10.1	0.0	0.0	10.1
Other	0.0	0.0	0.0	0.0
Subtotal	**144.9**	**0.0**	**0.0**	**144.9**

Indirect Capital Costs	2024	Year 2	Year 3+	Total
Indirects/Overheads (including benefits)	79.8	0.0	0.0	79.8
Capitalized interest or AFUDC, if any	0.0	0.0	0.0	0.0
Subtotal	**79.8**	**0.0**	**0.0**	**79.8**
Total Capital Costs (Gross)	**224.7**	**0.0**	**0.0**	**224.7**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**224.7**	**0.0**	**0.0**	**224.7**

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

The service to 128 customers on [redacted] consists of [redacted], which are normally fed from the [redacted]. The alternate feed is the [redacted].

In order to restore service [redacted], the customers have to be restored via manual operation of the switchgear.

The following is the outage history for the source to the switchgear at [redacted], for the period between 1/1/2018 and 12/31/2021:

Start Date	Start Time	Cause Type	Device	Duration	Customer Minutes
1/18/2021	8:08 AM	Equip Failure	FUSE_UG:8179:32095131	137	17536
4/3/2018	2:37 AM	Equip Failure	FUSE_UG:8179:32095131	188	16920

b. Project Need

[redacted]

a. Project Scope

Project Scope:



2. Alternatives Considered

Alternative 1 $581k–

One alternative is to replace the two existing manual switchgear units with a PME Type 9 switchgear pair. However, since the two switches are over 570' away from each other, one of the units would have to be relocated to be next to the other one, in order for them to operate as a switchgear pair. The spacing between them is limited by the length of standard communication cable (about 150') plus the fact that several tests are performed on the switchgear during the commissioning process, which would be impractical to do if they were too far away from each other. The total cost of this alternative was estimated at $415K.

(Preferred) Alternative 2 $224k–

The second alternative considered was to replace one of the two units with a PME type 9 automatic switch, to be operated as a single unit auto-transfer switch. Although this alternative would not be able to provide automatic backup to all 128 customers fed from the existing manual switches, the loop between the two switches can be reconfigured such that most of the customers, 121, would be provided automatic backup, and only 7 customers would be fed from the switch that will remain as a remote end manual alternate source. The total cost of this alternative has been estimated at $173K. Due to the lower cost and simplistic design, this option was chosen as the preferred alternative.

Alternative 3 $0 –

The third alternative is to do nothing. While there were no outage events on the feeder backbone portion of the [redacted] source to the switchgear, there were two cable failures in the last four years on the underground cable that supplies the two existing switches. Therefore, doing nothing was not chosen as the preferred alternative.

Project Option Comparison

Design Criteria	Option		
	1 – PME-9 Switchgear Pair	2 – PME-9 Single Units A/T	3 – Do Nothing
Normal loads < 80% of UG rating	X	X	X
Normal loads < 90% of OH rating	X	X	X
Contingent loads < 100% of rating	X	X	X
All zones < 500 customers	X	X	X
No automatic circuit ties with circuits emanating from the same bus	X	X	X
Provides automatic transfer capability & DSCADA capability	X	X	
Cost	$581K	$224.7K	$0
Cost / CM Saved	$48.19/CM	$20.72/CM	N/A
Cost / CI Saved	$7,614/CI	$3,288/CI	N/A
Preferred option		X	

The preferred option was selected because it provides the highest value to customers in terms of the cost of customer minutes and customer interruption saved.

3. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Initial Funding Authorization	December 2022
100% Engineering Completion	June 2023
Construction Start	January 2024
Testing/Commissioning	November 2024
In Service Date	November 2024

4. Regulatory Decisions

5. Codes and Standards

6. Risk and Contingencies

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2024	Low	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	2024	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2024	Medium	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	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2024	High	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2024	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2024	Low	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.
Technological risks involving integration of new technology	2024	Medium	Before use of new technology ensure support of standards and manufacturer. Schedule project to accommodate for extra time or ensure new technology is not on the critical path.
Wetlands / Environmentally sensitive area	2024	Low	Use of mats and specialty equipment, only work during certain times of the year.

7. References

References
DSEM 11.562 – Automatic Switchgear Selection Guide Diagrams
DSEM 11.511 – Standard Switchgear Units and Combinations
DSEM 11.551 – Automatic Switchgear Selection Guide
DSEM 07.223 – UG/DB Design Selections, and DSEM 05.831 – Underground System Nomenclature

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. Load Summary	*YES*
C. One Line	*YES*
D. Drawings Maps	*YES*

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

Attachment A – Project Load Summary

Project Load Summary CD02059.p

Attachment B – Project Maps

CD02059 Project Maps Proposed 2022

Attachment C – Project One-Lines

CD02059 One-Lines Proposed 2022.12.8.p

Attachment D – Cost Estimate Backup Details

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A. Cost Estimate

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02059

Man to Auto [redacted]

Work Classification

Category: Line
Type: SUNA
Type Desc: UG NETWORK AUTOMATION
Work Type:

Ownership / Management

AWC: East Hampton
Statewide: No
Owner: [redacted]
Manager:

Project Information

Status: Draft
SPS #:
AIS Score:
Associated Projects:
Assignment ID:
Patrol Find ID:

Budget Summary - Preferred Option

Replace with 1 - PME-9 A/T Switch

2024 ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
2	Repl with 1 - PME-9 switch	Prelim	0	28%	$173,465	$173,465
				2024 Total:	$173,465	$173,465
				Total Project:	$173,465	$173,465

B. Geographic Map



C. One line Diagram





Operations Project Authorization Form

Project Title: Man to Auto [redacted]	**Project Number: CD02059**
Date Prepared: 12/08/2022	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** UG Network Automation
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** Choose an item
Estimated in service date: 12/31/2024	**Emergency Related Request?** No
Eng./Constr. Resources Budgeted? Yes	**Facility Type** (check all that apply)**:** ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $159K	**Authorization Type:** Initial Funding

Executive Summary

This project was established to address the manual switchgear at [redacted]. This project proposes to [redacted], to be operated as a single unit auto-transfer switch. This proposal will automate 121 customers on [redacted].

The preferred feeder is the [redacted] circuit and the alternate feeder is the [redacted] circuit. The [redacted] has the capacity to accept the automatic transfer from the [redacted] without causing overload (see attachment A – Project Load Summary).

This project is part of an overall program to eliminate manual switchgear in order to eliminate the need to manually transfer customers to their alternative source for loss of the preferred source.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	Year 2023	Year 2024	Year 2025+	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	$0	$17	$0	$17
Outside Services	$0	$32	$0	$32
Materials	$0	$53	$0	$53
Removals	$0	$6	$0	$6
Risk and Contingency	$0	$1	$0	$1
Other	$0	$0	$0	$0
Subtotal – Direct Costs	**$0**	**$108**	**$0**	**$108**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	$0	$49	$0	$49
Capitalized interest or AFUDC, if any	$0	$2	$0	$2
Subtotal – Indirect Costs	**$0**	**$51**	**$0**	**$51**
Total Gross Capital Costs	**$0**	**$159**	**$0**	**$159**
Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Net Capital Project Costs	**$0**	**$159**	**$0**	**$159**

Technical Justification:

Project Need, Objective and Justification:

This project proposes to replace the existing manual [redacted] in order to provide for DSCADA capability, as well as automating the feed to the 121 customers fed from this switch. The total number of customers fed from switches at [redacted] is 128 customers. The loop on [redacted] will be reconfigured such that only 7 customers will be fed from the existing manual switch on pad [redacted] and 121 customers will be fed from the switch on pad [redacted], which will become the auto-transfer switch.

Project Scope:

[redacted]

Major Material:

- 1 – PME-9 DSCADA Capable Pad-Mounted switchgear unit for 15kV, Item Number 603869

Background:

The service to 128 customers on [redacted] consists of [redacted], which are normally fed from the [redacted] circuit. The alternate feed is the [redacted] circuit.

In order to restore service to the 128 customers fed from this switchgear, the customers have to be restored via manual operation of the switchgear.

The following is the outage history for the source to the switchgear at [redacted], for the period between 1/1/2018 and 12/31/2021:

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Alternatives Considered:

Alternatives were considered (please describe below)

One alternative is to replace the two existing manual switchgear units with a PME Type 9 switchgear pair. However, since the two switches are over 570' away from each other, one of the units would have to be relocated to be next to the other one, in order for them to operate as a switchgear pair. The spacing between them is limited by the length of standard communication cable (about 150') plus the fact that several tests are performed on the switchgear during the commissioning process, which would be impractical to do if they were too far away from each other. The total cost of this alternative was estimated at $415K.

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Project Option Comparison

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All zones < 500 customers	X	X	X
No automatic circuit ties with circuits emanating from the same bus	X	X	X
Provides automatic transfer capability & DSCADA capability	X	X	
Cost	$415K	$173K	$0
Cost / CM Saved	$48.19/CM	$20.72/CM	N/A
Cost / CI Saved	$7,614/CI	$3,288/CI	N/A
Preferred option		X	

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

Project Schedule

Milestone/Phase Name	Estimated Date
Initial Funding Authorization	December 2022
100% Engineering Completion	June 2023
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In Service Date	November 2024

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
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			accommodate for extra time or ensure new technology is not on the critical path.
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