Operations Project Authorization Form

Date Prepared: 06/06/2023	**Project Title: 4.8 KV Delta Grounding**
Company/ies: Eversource CT	**Project ID Number: 46860119**
Organization: Electric Field Operations	**Class(es) of Plant: Distribution**
Project Initiator: [redacted]	**Project Category: 4.8 KV Grounding**
Project Manager: [redacted]	**Project Type: Specific-Regulatory**
Project Sponsor: [redacted]	**Capital Investment Part of Original Operating Plan? Y**
Estimated in service date: 12/31/2019	**Emergency Related Request? No**
Eng. /Constr. Resources Budgeted? Y	**Facility Type (check all that apply):** **☒ PTF ☐ non-PTF ☒ Distribution**
Authorization Type: PAF	**Authorization Type: Full Funding**
Total Request: $859K	

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This initiative captures the cost necessary to remediate 4.8 kV ungrounded Delta system to comply with PURA regulatory requirements under Docket No. 96-05-05, National Electric Safety Code (NESC) 2017 Section 9 “Grounding Methods for Electrical Supply and Communication Facilities” and Eversource’ Standards DTR 16.411, DTR 16-704. The proper grounding of electrical circuits and equipment is intended to prevent damage to equipment, to safeguard property against fire, and to reduce the hazard of electrical shock. This project is consistent with the requirements of Docket

Project cost estimates were generated by using actual and historical costs of contractor resources completing past 4.8 kV Delta Grounding

The total project request is $859K.

Project Costs Summary

Capital Costs	Year 1	Year 2	Year 3+	Total
Internal Labor and Construction Equipment	285.8	0.0	0.0	285.8
Outside Services	32.7	0.0	0.0	32.7
Materials	69.4	0.0	0.0	69.4
Removals	51.0	0.0	0.0	51.0
Risk and Contingency	20.4	0.0	0.0	20.4
Other	0.0	0.0	0.0	0.0
Subtotal	**459.3**	**0.0**	**0.0**	**459.3**

Indirect Capital Costs	Year 1	Year 2	Year 3+	Total
Indirects/Overheads (including benefits)	397.0	0.0	0.0	397.0
Capitalized interest or AFUDC, if any	2.7	0.0	0.0	2.7
Subtotal	**399.7**	**0.0**	**0.0**	**399.7**
Total Capital Costs (Gross)	**859.0**	**0.0**	**0.0**	**859.0**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net)	**859.0**	**0.0**	**0.0**	**859.0**

WO NUMBER	WO DESCRIPTION	PROJECT DEPT CODE	PROJECT	PROJECT DESCRIPTION	WO IN SRV DATE	WO INIT DATE	Total Amount (K)
EAST4800	4.8kV Grounding Eastern	15D	468601	4.8KV GROUNDING FOR CODE COMPLIANCE	6/29/2022	10/25/2019	$859K

Technical Justification:

Project Need Statement

Electric circuits are grounded when intentionally or accidentally connected to earth. Grounding prevents the occurrence of dangerous differences in potential between circuits, equipment, or conductor enclosures and the earth or objects in contact with the earth. For 4.8 kV grounding to be effective, the path to ground from circuits and equipment should be permanent and continuous and should have impedance sufficiently low to limit its potential above ground and to facilitate the operation of over-current devices in the circuit. The effectiveness of an intentional ground, such as a driven ground rod, can be

nullified by high resistance to ground or loose or broken ground connections, which hamper or prevent the dissipation of fault currents and may contribute to the non-operation of overcurrent protective devices.

Project Objectives

The objective of the project is to comply with regulatory, NESC and Eversource' standards to properly ground its 4.8 kV Delta System.

Project Scope

The Company will install grounds and remediate locations in the Eastern Region.

Background / Justification

In order to comply with NESC grounding requirement the Company will install grounding electrodes to its 4.8 kV Delta System in accordance to standards DTR 16.411, DTR 16-704.These project is driven by regulatory requirements under Docket 96-05-05 to upgrade its system in accordance to NESC requirement for "Grounding Methods for Electrical Supply and Communication Facilities"

Alternatives Considered with Cost Estimates

This is a regulatory requirement that will be superseded until all 4.8kV Delta System grounding is completed or is converted to another voltage class system.

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Selection of 4.8kV grounding locations	Dec, 2018
Design	Januray, 2019
Bid	January, 2019
Award & Construction Start	April, 2019
Construction Completion	December 2019

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.	2019	Low	Include a higher number of grounding locations in estimate to reduce changes during grounding installation. Conduct a walk down in project development to avoid potential issues.
Construction resources / storm delays	2019	Medium	Use competitive bidding to ensure lowest outside labor cost. Bid early in the year to allow long construction period.
Materials shortage or long lead times	2019	Low	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.

References
None

Attachments (One-Line Diagrams, Images, etc.)
N/A