EVERSOURCE

Supplement Authorization Form

Project Title: [redacted] ***DGI Sensors***	**Project Number: CD00916**
Date Prepared: 02/01/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** Network Reliability
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: $444K	**Approved In-Service Date:** 12/31/21
Supplement Request: $857K	**Estimated In-Service Date: 10/31/23**
Total Capital Request: $1,301K	**Authorization Type:** Supplement Request
	Reason: Cost Overage

1. Project Background

The purpose of this project is to enhance the monitoring capabilities of the Digital Grid Network Monitoring system by installing [redacted] Digital Grid Sensors at [redacted].

When Project CD00916 was originally developed in 2018, the initial scope called for in-house resources to execute the installation of these sensors while taking advantage of the major maintenance inspection cycle for network transformers and protectors at the South End feeders. Network Major Maintenance Inspection requires the allocation of resources to conduct activities such as traffic control, planning feeder outages and conducting cleaning activities prior to entering a network vault.

However, the project could not be executed as planned mainly due to severe weather events that prevented the feeders to be switched out as planned, the Distribution system's moratorium, and internal resources' attrition. Consequently, Management made the decision to submit an RFP (Request for Proposal) and solicit bids for a qualified vendor to install these sensors. An advantage resulting from an outside resource installing these sensors is that there isn't a need to deenergize a feeder to install these sensors; nonetheless, it still requires to conduct costly activities such as traffic control and cleaning the network vaults. These activities resulted in adding additional cost to project CD00916.

Project CD00916 is completed with all work orders closed as of December 2023.

Current dollar amount authorized: $444K (Full Funding 9/24/18).
Supplemental request: $857K.
New total request: $1,301K.

Project Scope:

- Cleaning activities to enter a vault prior to install these sensors.
- Flaggers and/or local Police support for traffic control

Project status is 100% complete, in service as of 9/30/23.

2. Supplement Justification Overview

The following are reasons for the budget being over the authorized amount:

a. Installation of the sensors was completed by an outside vendor rather than internal resources as originally planned.
b. The bid to install [redacted] sensors at [redacted] locations by an outside vendor came higher than expected.
c. Project CD00916 absorbed the cost for cleaning activities such as pumping water out of vaults, air control and removing sludge out from network vaults.
d. High cost of local Police's support to set up work zones and provide traffic control.

3. Supplement Cost Summary (Project Total)

Line-item Category	To Date Spend Year(s)	Prior Authorized Year(s)	Variance (Supplemental Request) Year(s)	New Total Request (Add Prior Authorized and Variance) Year(s)
Internal Labor and Construction Equipment	$27.1	$0	$27.1	$27.10
Outside Services	$543.4	$260.0	$283.4	$543.40
Materials	$224.3	$90.3	$134.0	$224.30
Removals	$22.7	$0.0	$22.7	$22.70
Risk and Contingency	$90.8	$0.0	$90.8	$90.80
Other	$.1	$0.0	$.1	$.10
SUBTOTAL DIRECTS W/ RISKS	**$908.3**	**$350.2**	**$558.1**	**$908.3**
Indirect / Overhead (including benefits)	$375.1	$92.3	$282.8	$375.1
AFUDC	$17.7	$1.9	$15.8	$17.7
Subtotal – Indirect Costs	**$392.8**	**$94.2**	**$298.6**	**$392.8**
TOTAL CAPITAL REQUEST	**$1,301.1**	**$444.4**	**$856.7**	**$1,301.1**
Reimbursables/Customer Contribution	$0	$0	$0	$0
PROJECT TOTAL (LESS REIMBURSABLES)	**$1,301.1**	**$444.4**	**$856.7**	**$1,301.1**

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.

Line item Category	Year 2021	Year 2022	Year 2023	Year 2024	Total
Internal Labor and Construction Equipment	0.1	0.1	24.3	-2.2	**22.3**
Outside Services	2.3	1.3	488.8	-44.6	**447.8**
Materials	1.0	0.5	201.7	-18.4	**184.8**
Removals	0.7	0.4	155.9	5.6	**162.6**
Risk and Contingency	0.0	0.0	0.0	90.8	**90.8**
Other	0.0	0.0	0.1	0.0	**0.1**
SUBTOTAL DIRECTS W/ RISKS	**4.1**	**2.3**	**870.8**	**31.1**	**908.3**
Indirect / Overhead (including benefits)	3.4	1.3	494.5	-124.1	375.1
AFUDC	0.1	0.1	14.3	3.2	17.7
Subtotal – Indirect Costs	**3.5**	**1.4**	**508.8**	**-120.9**	**392.8**
TOTAL CAPITAL REQUEST	**7.6**	**3.7**	**1,379.6**	**-89.8**	**1,301.1**
Reimbursables/Customer Contribution	0	0	0	0	0
PROJECT TOTAL (LESS REIMBURSABLES)	**7.6**	**3.7**	**1,379.6**	**-89.8**	**1,301.1**

5. Lessons Learned

Operations Project Authorization Form

Date Prepared: 9/24/2018	**Project Title: [redacted] *DGI Sensors***
Company/ies: CT	**Project ID Number: *CD00916***
Organization: Distribution Design	**Class(es) of Plant: Distribution**
Project Initiator: [redacted]	**Project Category: Network Automation**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Project Purpose: Install Digital Grid Sensors**
Estimated in service date: 12/31/2021	**If Transmission Project: PTF? N/A**
Eng. /Constr. Resources Budgeted? No	**Capital Investment Part of Original Operating Plan? No**
Authorization Type: Full Funding	**O&M Expenses Part of the Original Operating Plan? No**
Total Request: $444,389	

Financial Requirements:

Project Authorization
ERM: _____

FP&A: _____

Executive Summary

This project is part of the second phase of installing the Digital Grid network remote monitoring system. With the execution of this project Eversource will add the benefit of prolonging the useful life of the protector and transformer due to the system's ability to remotely notify System Operators when conditions such as network protectors pumping or cycling, loss of protector pressure and the presence of water occur.

Overall, these projects are focused on enabling Eversource to increase network protector's reliability and defer network protector's major maintenance from a 2-year cycle to a 4-year cycle, thus creating an O+M savings.

[redacted]

This project was presented at TRC on 04/07/17 with an ENG estimate of $210,000 and was approved at $20,000 for Engineering.

Following detailed design, **the total project request is $$444,389**.

The revised cost estimate is based on contractor working on two vaults a day at 12 hours a day; also included is Clean Harbor's time to clean out the vaults; traffic control for 12 hours a day.

Project Costs Summary

	Prior Authorized*	Additional Request	2019	2020	2021	Total**
Capital Additions Direct	$0	$0	$116,740	$116,740	$116,740	$350,221
Less Customer Contribution	$0	$0	$0	$0	$0	$0
Removals Net of Salvage	$0	$0	$0	$0	$0	$0
Total - Direct Spending	$0	$0	$116,740	$116,740	$116,740	$350,221
Capital Additions - Indirect	$0	$0	$30,759	$30,759	$30,759	$92,276
AFUDC	$0	$0	$631	$631	$631	$1,893
Total Capital Request	$19,580	$424,809	$148,130	$148,130	$148,130	$444,389
O&M	$420	-$420	$0	$0	$0	$0
Total Request	**$20,000**	**$424,389**	**$148,130**	**$148,130**	**$148,130**	**$444,389**
* Current Amount authorized in Powerplan						
** Total amount needed for authorization in PowerPlan based on ACT						

Financial Evaluation

Direct Capital Costs	2019	2020	2021	Total
Straight Time Labor	$ -	$ -	$ -	$ -
Overtime Labor	$ -	$ -	$ -	$ -
Outside Services	$ 86,652	$ 86,652	$ 86,652	$ 259,957
Materials	$ 30,088	$ 30,088	$ 30,088	$ 90,264
Other, including contingency amounts	$ -	$ -	$ -	$ -
Total	$ 116,740	$ 116,740	$ 116,740	$ 350,221

Indirect Capital Costs	2019	2020	2021	Total
Indirects/Overheads (including benefits)	$ 30,759	$ 30,759	$ 30,759	$ 92,276
Capitalized interest or AFUDC, if any	$ 631	$ 631	$ 631	$ 1,893
Total	$ 31,389	$ 31,389	$ 31,389	$ 94,168
Total Capital Costs	$ 148,130	$ 148,130	$ 148,130	$ 444,389
Less Total Customer Contribution	$ -	$ -	$ -	$ -
Total Capital Project Costs	$ 148,130	$ 148,130	$ 148,130	$ 444,389
Total O&M Project Costs	$ -	$ -	$ -	$ -
Total Project Cost	$ 148,130	$ 148,130	$ 148,130	$ 444,389
* to be completed if supplemental authorization is required				

Future Financial Impacts:

Provide below the estimated future costs that will result from the project:
Note: Dollar values are in thousands:

Future Costs	Year 20__	Year 20__	Year20__	Year 20__+	Total Future Project Costs
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Describe the estimated future Capital, O&M and/or Other costs noted above:

What functional area(s) will these future costs be funded in?_____
A representative from the respective functional area is required to be included as a project approver.

If this is other than a Reliability Project, please complete the section below:

Provide below the estimated financial benefits that will result from the project:
Note: Dollar values are in thousands:

Future Benefits	Year 20__	Year 20__	Year20__	Year 20__+	Total Future Project Benefits
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Describe the estimated future Capital, O&M and/or Other benefits noted above:

What functional area(s) will these benefits be reflected in?_____
A representative from the respective functional area is required to be included as a project approver.

Asset Retirement Obligation (ARO) and/ or Environmental Cleanup Costs (Environmental Liabilities):

Is there an ARO associated with this project? If yes, please provide details:

Are there other environmental cleanup costs associated with this project? If yes, please provide details:

Technical Justification:

Project Need Statement

We are in the second phase of installing the Digital Grid network remote monitoring system for Eversource CT. The first phase was installing a new Digital Grid network protector relay in our transformer vaults and a feeder sensor and receiver cabinet in our substations. In phase 2 we plan on installing Digital Grid sensors in the Digital Grid equipped network protectors. These sensors will enable us to defer network protector major maintenance from a 2-year cycle to a 4-year cycle. It is important to note that the opportunity to glean O+M savings from the Digital Grid network monitoring system was not available when many of these network monitoring projects first started. After the merger, all the operating companies transitioned to a unified maintenance manual. One of the new practices to benefit legacy CL&P is that the active monitoring of our network protectors gives us the ability to shift to a four-year protector maintenance frequency. The deferred maintenance will significantly reduce the operating cost of Eversource CT

Benefits of these sensors also include System Operators being notified to conditions such as network protectors pumping or cycling, loss of protector pressure and the presence of water thereby materially prolonging the useful life of the protector and transformer. We look forward to starting this venture and this project provides the necessary first step to installing those sensors and gaining those savings.

Project Objectives

This project intends to leverage the communication infrastructure of the network monitoring systems being installed in Eversource CT major networks by installing sensors in the network protectors that would notify operators of water ingress, loss of protector pressure and excessive pumping. The sensors would also make it possible to move from a 2-year protector major maintenance schedule to a 4 year frequency generating significant O+M savings for the Company.

Project Scope

[redacted]

Background / Justification

These sensor alarms will enable us to defer network protector major maintenance from a 2-year cycle to a 4-year cycle. This will significantly reduce the operating and maintenance costs of Eversource CT.

Business Process and / or Technical Improvements:

The deferral of network major maintenance from a 2-year cycle to a 4-year cycle in Digital Grid equipped protectors will be a significant savings for Eversource CT. The project estimate assumes these sensors will be installed during planned network major maintenance outages and that no switching will be planned to install these sensors.

Alternatives Considered with Cost Estimates

No alternatives considered.

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Relay Replacement Start	Feb 2019
ISD	12/31/2021

Regulatory Approvals

None required.

Risks and Risk Mitigation Plans



Financial risks include extra spend due to traffic control and electrician labor. This estimate assumes that this project (CD00916) will be worked separately from CD00352. CD00352 was completed previously. Since both these projects will be worked separately we will see an increase of $400 per location for traffic control and $195 per location for electrician labor.

References

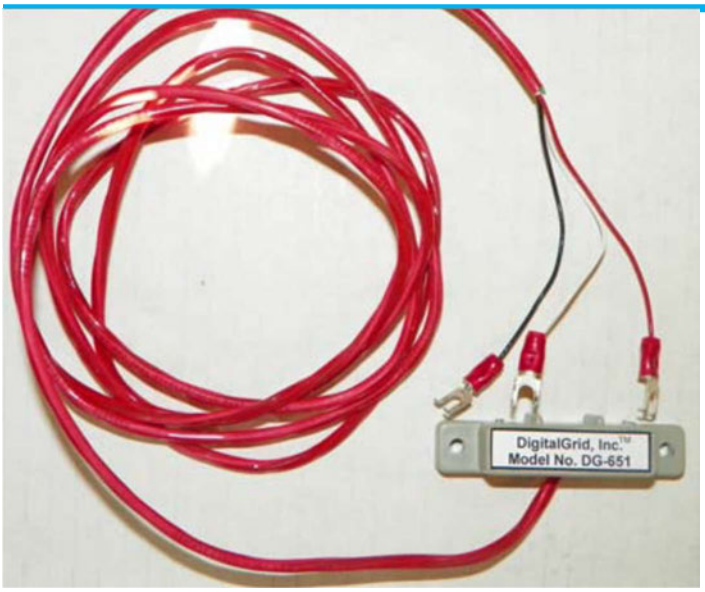
Digital Grid Project Scope Cost EST 2-041

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

[redacted]



[redacted]



[redacted]





CD00916 Southend
(sensors) ACT-09241