Project Authorization Form

Date Prepared: 8/02/17	Project Title: Switchgear enclosure refurbishment
Company/ies: Eversource CT	Project ID Number: CS00278
Organization: SS Technical Eng	Class(es) of Plant: Distribution
Project Initiator: [redacted]	Project Category: General Mod
Project Owner/Manager: [redacted]	Project Type: Specific
Project Sponsor: [redacted]	Project Purpose:
Estimated in service date: 12/31/17	If Transmission Project: NA
Supplement to Existing Authorization? No	Capital Investment Part of Original Operating Plan Y
Eng./Constr. Resources Budgeted? Yes	O&M Expenses Part of the Original Operating Plan? N

Project Authorization

Project authorization must be in accordance with the approval levels included in the Delegation of Authority Policy (DOA).

If Chief Executive Officer or subsidiary board approval is required, document the review by Enterprise Risk Management (ERM) and Financial Planning and Analysis (FP&A)

ERM: _____

FP&A: _____

Executive Summary

Substation Operations and Substation Technical Engineering have identified twenty one (21) metal clad switchgear units that require enclosure refurbishment across Connecticut. These refurbishments are part of a substation improvement program to address aging switchgear enclosures. The refurbishments will address many of the operations concerns for failing roofs and the consequence of water penetration into live equipment. Substation Operations has recently dealt with catastrophic failures whose root-cause was directly related to water and moisture entering the metal-clad enclosures. The actions to mitigate and repair these assets have proven to be expensive once the damage has occurred.
Each refurbishment will substantially increase the useful life of these assets by 15 years and it will preserve and improve substation's reliability. This proposed project will address the listed substations, providing a complete enclosure refurbishment as described in the Scope of work section of this document

Total project request: $450,000.00

Project Costs Summary

Note: Dollar values are in thousands	Prior Authorized*	2017	Total
Capital Additions Direct	364	364	$364
Less Customer Contribution	0	0	$0
Removals Net of Salvage	7	7	$7
Total - Direct Spending	$372	$372	$372
Capital Additions - Indirect	77	77	$77
Subtotal Request	$449	$449	$449
AFUDC	2	2	$2
Total Request	$450	$450	$450

Financial Evaluation

Direct Capital Costs	2017	Total
Straight Time Labor	22	$22
Overtime Labor	0	$0
Outside Services	350	$350
Materials	0	$0
Other, including contingency amounts	0	$0
Total	$372	$372

Indirect Capital Costs	2017	Total
Indirects/Overheads (including benefits)	77	$77
Capitalized interest or AFUDC, if any	2	$2
Total	$79	$79

Total Capital Costs	$450	$450
Less Total Customer Contribution	0	$0
Total Capital Project Costs	$450	$450
Total O&M Project Costs	$0	$0

Technical Authorization Form

Date Prepared: 07/07/2017	Project Title: Switchgear enclosure refurbishment
Company/ies: Eversource CT	Project ID Number: CS00278
Organization: SS Technical Eng	Class(es) of Plant: Distribution
Project Initiator: [redacted]	Project Category: General Mod
Project Owner/Manager: [redacted]	Project Type: Specific
Project Sponsor: [redacted]	Project Purpose:
Estimated in service date: 2017	If Transmission Project: *NA*
Authorization Type: Eng	Authorization Amount: $45,000

Project Need Statement

Substation Operations and Substation Technical Engineering have identified twenty one (21) metal clad switchgear units that require enclosure refurbishment across Connecticut. These refurbishments are part of a substation improvement program to address aging switchgear enclosures. The refurbishments will address many of the operations concerns for failing roofs and the consequence of water penetration into live equipment. Substation Operations has recently dealt with catastrophic failures whose root-cause was directly related to water and moisture entering the metal-clad enclosures. The actions to mitigate and repair these assets have proven to be expensive once the damage has occurred.

Each refurbishment will substantially increase the useful life of these assets by 15 years and it will preserve and improve substation's reliability. This proposed project will address the listed substations, providing a complete enclosure refurbishment as described in the Scope of work section of this document.

Project Objectives

- To refurbish the entire enclosure in order to eliminate future water leaks either through roof top through bushing, rusting metal or poor roof seam seals for a period of not less than 10 years

- Increase reliability by eliminating the potential risk of a catastrophic failure

- Increase employees' safety

Project Scope

- Refurbishment of twenty-one (21) metal clad switchgear units. (Please see list of substation in attachment 1

    - All areas either for repair or for general coating shall have the rust removed via 1187t-with a 1 mil profile.

    - All surfaces shall be de- oxygenated and treated w/ a tannic or citric acid compound to convert flashed metal to a suitable surface, ready for coating.

    - All surfaces shall be prepared so a finish coat shall be applied.

    - Hand Tool Cleaning Removal of all rust scale, mill scale, loose rust and loose paint by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or by a combination of these methods.

    - All flat steel surfaces except for horizontal surfaces, shall receive 2 coats at 12 mils thickness.

- We expect to complete refurbishments by December 31st 2017
- As part of this project, bus insulation will be tested and inspected for each of the switchgear units being refurbished.

Background / Justification

Twenty one Metal-clad switchgear units were identified as requiring refurbishment to align with the CT Southwest substation improvements. The proposed refurbishments will address future environmental issues such as water leaks and visible rusting. Water and moisture intrusion is one of the main contributing factors of catastrophic failure due to water contact with live high voltage electrical equipment and a potential cause for internal structural damage.

Business Process and / or Technical Improvements:

Each refurbishment must comply with Engineering standards and Capitalization requirements underlined on the Metal Clad Switchgear Refurbishment process. A copy of the approved process is attached.

Cost Estimate and Assumptions

The refurbishment cost depends on the size of the metal clad switchgear and its deteriorated condition. The average cost to refurbish metal clad switchgear has been $20,000.00. It is expected that the average cost multiplied by the number of units to refurbish will equal the actuals
The total contractor cost estimate of [redacted] = $420,000 is being requested but this amount does not include company loaders. A formal estimate was not performed and therefore a total cost with loaders is not known.
The project is asking for $450,000

Alternatives Considered with Cost Estimates

A do nothing approach, was not acceptable by upper management and the commitments made to management.

Replacement of the individual switchgear units was not reviewed due to the cost implications. The average cost to replace an (8) eight position PCE is approximately $4M - $5M.

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Engineering	July 2017
Construction start	August 1st. 2017
Construction completion	December 31st 2017

Regulatory Approvals

N/A

Risks and Risk Mitigation Plans

-Substation moratorium ending on August
- Scheduling Switching with Substation Planners and Districts.

The mitigation to circumvent the moratorium is to refurbish the switchgear's body first and complete the roof section after the moratorium is over, which require working in parallel and closely with planners to have manpower and equipment switched out.

Guidelines: Please consider the risks below as a basis for your project risk analysis. The table will have to be customized for your project. You will not need to include all of the risk events, only those that make sense for your project. Please work with planning on your risk assessment.

Risk Event	Risk Horizon	Likelihood of Occurrence	Expected Value Cost Exposure ($M)	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2017	10-20%	Project Cost x Risk Factor	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.	2017	15%	Labor cost x Outside Labor Premium	Plan internal resources to support the contractor work.
Storm delays	201X	10%	Labor cost x Outside Labor Premium	Storm activity may delays work due to the nature of the proposed work,
System abnormal configuration	201X	5%	Reliability Impacts	Schedule work to minimize system abnormal time. Most of the proposed work will not require outages. There may be a need for re-sealing around roof bushings.

Attachments 1

Switchgear refurbishment process

Refurbishment Process

- Metal Roof surface is evaluated for rusted out areas needing repair
- Roof Caps over all seams are removed and roof surface underneath is reinforced and repaired
- Roof caps are reinstalled and injected with foam to seal and protect seams
- Sealant material is then applied to roof surface and caps

General preparation

- All areas either for repair or for general coating shall have the rust removed via 1187t-with a 1 mil profile.
- All surfaces shall be de- oxygenated and treated w/ a tannic or citric acid compound to convert flashed metal to a suitable surface, ready for coating.
- All surfaces shall be prepared so a finish coat shall be applied.
- Hand Tool Cleaning Removal of all rust scale, mill scale, loose rust and loose paint by hand wire brushing, hand sanding, hand scraping, hand chipping or other hand impact tools or by a combination of these methods.
- All flat steel surfaces except for horizontal surfaces, shall receive 2 coats at 12 mils thickness.

Microsoft PowerPoint Presentation

District	Substation	
[redacted]		

District	Substation	Code
[redacted]		

District	Substation	Code
[redacted]		

-Supporting images



