EVERSOURCE
Project Authorization Form

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# Operations Project Authorization Form

**Approved by EPAC Chairmen external to meeting on 01/30/2019**

**Link to 02/6/19 EPAC Meeting Minutes**

| | |
|---|---|
| **Date Prepared: 03/07/2019, Revised 03/13/2019** | **Project Title: [redacted] Substation Expansion & Project Solutions** |
| **Company/ies: Eversource CT** | **Project ID Number: 404578 (T) CS00335 (D)** |
| **Organization: Strategy & Performance** | **Class(es) of Plant: Transmission / Distribution** |
| **Project Initiator: [redacted]** | **Project Category: Asset Strategy/Regulatory** |
| **Project Manager: [redacted]** | **Project Type: Specific** |
| **Project Sponsor: [redacted]** | **Project Purpose: Asset Strategy/Regulatory** |
| **Estimated in service date: 06/31/2021** | **If Transmission Project: PTF** |
| **Eng. /Constr. Resources Budgeted? No** | **Capital Investment Part of Original Operating Plan? Yes** |
| **Authorization Type: Full Funding** | **O&M Expenses Part of the Original Operating Plan? N/A** |
| **Total Request: $50.70M, $48.32M (T) and $2.38M (D)** | |

## Financial Requirements:

### Project Authorization

ERM: _____

FP&A: _____

### Executive Summary

This is a revised PAF for full funding of $50.70M ($48.32M – Transmission, $2.38M – Distribution) for engineering field support, material procurement, construction and test services for multiple program solutions that are being addressed [redacted] The details of each of these program solutions is covered in the scope section. Please refer to pages 28 and 29 of this document for the detailed +/- 25% construction grade level estimate for Transmission and Distribution work.

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This PAF has been revised and is being submitted for EPAC approval following the advancement of design to 100% and completion of the procurement process. A subsequent extensive review of the original project estimate was performed and determined that the project costs will increase from $20.15M to $50.70M.

Prior Funding Authorization:

The project initially received authorization for partial funding of $1.86M to support the following engineering activities:

I. [redacted]

On February 14, 2018, the project received full funding approval of $20.15M based on the following estimate approach and to support the following activities:

Estimating approach:

- Desktop review of Project scope; a field walkdown performed by Eversource Engineering and an Engineering contractor as part of option analysis.
- Estimate developed by Engineering contractor using ~10% Engineering design
- Actual installed labor costs from previous projects
- Actuals material costs from previous projects and estimated vendor quotes for material

Authorized Activities:

- Engineering Support; environmental permitting; siting; material procurement; electrical and civil construction; and testing.

After receiving competitively bid construction services costs, a subsequent extensive review of the original project estimate was performed and determined that the project costs will increase from $20.15M to $50.70M.

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The following items are major contributors to this increase:

- Major Material costs being greater than the original approved budget

The Material line item budget increase of $6.79M includes the competitively bid costs for material. [redacted]

- Electrical/Civil construction costs are greater than the original approved budget

The Construction line item budget increase of $4.25M includes the competitively bid costs for construction services and additional construction oversight due to the increased scope and longer duration forecasted for the project.

- Testing & Commissioning costs are greater than the original approved budget

The Test & Commissioning line item budget increase of $4.78M includes the competitively bid costs for testing services and increased Lead Commissioning Engineer (LCE) oversight. The project involves complex, outage constrained cutovers of protections and controls requiring dedicated LCE for the duration of the project to mitigate the risk of inadvertent trips during the cutovers.

- Engineering cost is greater than the original approved budget

The Engineering line item budget increase of $0.73M includes an increased forecast for engineering field support during construction due to the increased scope and duration of the project.

- Project Mgr & Support is greater than the original approved budget

The Project Management & Support line item budget increase of $1.8M includes adequate

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funds to support Project Management, Siting & Permitting, Environmental, Siting & Construction Services, Scheduling and Investment Planning. The original budget of $0.09M was inadequate to support the increased scope and duration of the project.

- Additional contingency

A detailed risk review, included on page 8 & 9, resulted in a contingency of $4.8M. This closely aligned with a separate analysis by the Enterprise Risk Management (ERM).

- Indirects

The revised budget includes a rate of ~18%. This results in an increase of ~$6.36M compared to original budget.

- AFUDC

The original project budget assumed an AFUDC rate of ~1.8%. The revised budget includes a rate of ~2.7%. This results in an increase of ~$3.07M compared to the original budget.

| Line Item Category | Original Estimate | Updated Estimate | Delta |
|---|---|---|---|
| **Material** | $3.71M | $10.33M | $6.62M |
| **Construction** | $8.83M | $13.08M | $4.25M |
| **Test & LCE** | $2.18M | $6.95M | $4.77M |
| **Engineering** | $1.64M | $2.37M | $0.73M |
| **Project Mgr. & Support** | $0.09M | $1.91M | $1.82M |
| **Removal** | $0.92M | $0.64M | ($0.28M) |
| **Escalation** | $0.63M | $0.52M | ($0.11M) |
| **Contingency** | $1.48M | $4.8M | $3.32M |
| **Indirects** | $0.21M | $6.57M | $6.36M |
| **AFUDC** | $0.46M | $3.53M | $3.07M |
| **TOTAL** | $20.15M | $50.70M | $30.55M |

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Project Justification:

[redacted]

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## Project Costs Summary (Transmission)

| PAF (dollars in thousands) | Prior Authorized | Prior Actuals | 2019 | 2020 | 2021 | 2022 | 2023 | Totals |
|---|---|---|---|---|---|---|---|---|
| Capital Additions - Direct | $ 19,489 | $ 4,849 | $ 12,169 | $ 13,997 | $ 6,244 | $ - | $ - | $ 37,259 |
| Less Customer Contribution | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Removals net of Salvage ___% | $ - | $ - | $ - | $ 528 | $ 1,147 | $ - | $ - | $ 1,675 |
| Total - Direct Spending | $ 19,489 | $ 4,849 | $ 12,169 | $ 14,524 | $ 7,391 | $ - | $ - | $ 38,934 |
| Capital Additions - Indirect | $ 208 | $ 619 | $ 2,114 | $ 2,231 | $ 1,025 | $ - | $ - | $ 5,988 |
| Subtotal Request | $ 19,697 | $ 5,468 | $ 14,283 | $ 16,755 | $ 8,416 | $ - | $ - | $ 44,922 |
| AFUDC | $ 457 | $ 232 | $ 673 | $ 1,293 | $ 1,201 | $ - | $ - | $ 3,399 |
| Total Capital Request | $ 20,154 | $ 5,701 | $ 14,956 | $ 18,048 | $ 9,617 | $ - | $ - | $ 48,322 |
| O&M | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Total Request | $ 20,154 | $ 5,701 | $ 14,956 | $ 18,048 | $ 9,617 | $ - | $ - | $ 48,322 |

## Financial Evaluation (Transmission)

| | Prior | Prior | 2019 | 2020 | 2021 | 2022 | 2023 | |
|---|---|---|---|---|---|---|---|---|
| **Direct Capital Costs** | **Authorized** | Actuals | **Year 2** | **Year 3** | **Year 4** | **Year 4** | **Year 4** | **Total** |
| Straight Time Labor | $ 118 | $ 487 | $ 477 | $ 523 | $ 288 | $ - | $ - | $ 1,775 |
| Overtime Labor | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Outside Services | $ 14,181 | $ 1,391 | $ 6,917 | $ 9,127 | $ 5,130 | $ - | $ - | $ 22,565 |
| Materials | $ 3,710 | $ 2,777 | $ 3,328 | $ 3,178 | $ 14 | $ - | $ - | $ 9,297 |
| Other – Vehicles, expenses, Contingency | $ 1,480 | $ 194 | $ 1,448 | $ 1,696 | $ 1,959 | $ - | $ - | $ 5,297 |
| Total | $ 19,489 | $ 4,849 | $ 12,169 | $ 14,524 | $ 7,391 | $ - | $ - | $ 38,934 |
| | | | | | | | | |
| **Indirect Capital Costs** | | | **Year 2** | **Year 3** | **Year 4** | **Year 4** | **Year 4** | **Total** |
| Indirects/Overheads (including benefits) | $ 208 | $ 620 | $ 2,114 | $ 2,231 | $ 1,025 | $ - | $ - | $ 5,989 |
| Capitalized interest or AFUDC, if any | $ 457 | $ 232 | $ 673 | $ 1,293 | $ 1,201 | $ - | $ - | $ 3,399 |
| Total | $ 665 | $ 851 | $ 2,787 | $ 3,524 | $ 2,226 | $ - | $ - | $ 9,389 |
| | | | | | | | | |
| Total Capital Costs | $ 20,154 | $ 5,700 | $ 14,956 | $ 18,048 | $ 9,617 | $ - | $ - | $ 48,322 |
| | | | | | | | | |
| Less Total Customer Contribution | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| | | | | | | | | |
| **Total Capital Project Costs** | $ 20,154 | $ 5,700 | $ 14,956 | $ 18,048 | $ 9,617 | $ - | $ - | $ 48,322 |
| | | | | | | | | |
| **Total O&M Project Costs** | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |

***Note:***

***(1) Dollar values are in thousands***

***(2) The Total Capital Projects Costs (Transmission) includes Telecom Tower as General Plant.***

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## Project Costs Summary (Distribution)

***Note: Dollar values are in thousands***

| PAF (dollars in thousands) | | | | |
|---|---|---|---|---|
| | **Prior Authorized** | **2019** | **2020** | **Totals** |
| Capital Additions - Direct | $ 1 | $ 1,141 | $ 346 | $ 1,487 |
| Less Customer Contribution | $ - | $ - | $ - | $ - |
| Removals net of Salvage_____% | $ - | $ - | $ - | $ - |
| Total - Direct Spending | $ 1 | $ 1,141 | $ 346 | $ 1,487 |
| Capital Additions - Indirect | $ 1 | $ 588 | $ 168 | $ 757 |
| Subtotal Request | $ 2 | $ 1,729 | $ 513 | $ 2,244 |
| AFUDC | $ 0 | $ 55 | $ 78 | $ 133 |
| Total Capital Request | $ 2 | $ 1,783 | $ 591 | $ 2,377 |
| O&M | $ - | $ - | $ - | $ - |
| Total Request | $ 2 | $ 1,783 | $ 591 | $ 2,377 |

## Financial Evaluation (Distribution)

***Note: Dollar values are in thousands***

| | Prior | | | |
|---|---|---|---|---|
| **Direct Capital Costs** | **Actuals** | **2019** | **2020** | **Total** |
| Straight Time Labor | $ 1 | $ 2 | $ 4 | $ 7 |
| Overtime Labor | $ - | | | $ - |
| Outside Services | $ - | $ 575 | $ 156 | $ 731 |
| Materials | $ - | $ 512 | $ 132 | $ 644 |
| Other – Vehicles, expenses, Contingency | $ 0 | $ 52 | $ 53 | $ 105 |
| Total | $ 1 | $ 1,141 | $ 346 | $ 1,487 |
| | | | | |
| **Indirect Capital Costs** | | **2019** | **2020** | **Total** |
| Indirects/Overheads (including benefits) | $ 1 | $ 588 | $ 168 | $ 757 |
| Capitalized interest or AFUDC, if any | $ 0 | $ 55 | $ 78 | $ 133 |
| Total | $ 1 | $ 642 | $ 246 | $ 889 |
| | | | | |
| Total Capital Costs | $ 2 | $ 1,783 | $ 591 | $ 2,377 |
| | | | | |
| Less Total Customer Contribution | $ - | $ - | $ - | $ - |
| | | | | |
| **Total Capital Project Costs** | $ 2 | $ 1,783 | $ 591 | $ 2,377 |
| | | | | |
| **Total O&M Project Costs** | $ - | $ - | $ - | $ - |

*Note: Explain unique payment provisions, if applicable*

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**Contingency Risk Assessment:**

The Risk Assessment workshop was conducted with Enterprise Risk Management (ERM) and the project team to identify risks, likelihoods, and impacts. The project contingency is adequate to account for the risk exposure of ERM.

| Risk Description | Risk Horizon | Impact | Risk Mitigation |
|---|---|---|---|
| Encounter unexpected obstructions (rock/ledge/duct banks/conduit) during underground construction causing increased construction costs | 2019-2020 | $1.00M | Structure the Electrical/Civil contract to incorporate allowances for unexpected obstructions using unit pricing from bid. The Risk Assessment workshop evaluated the impact to be $1.00M. |
| Alteration of work sequence (by CONVEX/ISO-NE) due to system conditions dictate the need for additional engineering design work | 2019-2021 | $0.65M | Coordinate early with ISO-NE, CONVEX & Millstone Energy to review and identify potential outage conflicts |
| Construction is susceptible to weather delays, causing scheduling delays that may impact ISO-NE approved equipment outage dates | 2019-2021 | $0.65M | Build the outage schedule to allow for recovery from potential weather-related schedule delays |
| Construction/material contracts are higher than anticipated | 2019-2020 | $0.65M | Maintain continuous communication with major material suppliers and negotiate pricing for anticipated schedule delays |
| Removal and off-site disposal of contaminated soil and asbestos contained materials exceeds anticipated cost | 2019-2021 | $0.63M | Incorporate allowances for off-site disposal of contaminated soil and asbestos based on precharacterization data from accessible locations |

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| | | | |
|---|---|---|---|
| Complex outage planning and work sequencing for Equipment cutover from Terminal based outages to one breaker at a time causing schedule delays | 2019-2021 | $0.22M | Coordinate early with Key stakeholders (ISO-NE, CONVEX, Millstone Energy) to address work sequence approach |
| Additional on-site construction and commissioning management and monitoring due to complex cut-overs | 2019-2021 | $0.22M | Evaluate the need for additional resources after development of commissioning plans |
| Material delivery delays impact construction schedule | 2019-2021 | $0.22M | Upon project funding approval, issue a partial purchase order to allow construction contractor to purchase long lead items |
| | **TOTAL** | **$4.24M*** | |

*** The project team recommends the contingency amount of $4.8M due to unknown existing subsurface conditions and quantity of contaminated soil disposal.**

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**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? N/A

**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? N/A

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

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

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

UNKNOWN AT THIS TIME – as the detailed engineering progresses and development of the +/-10% is completed, these liabilities should be known if any.

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**Technical Justification:**

**Project Need Statement**

[redacted]

**Project Objectives**

The project objective is to address space issues for the following obsolete relay replacement projects and satisfy Northeast Power Coordination Council (NPCC) requirements for Directory 1 and Directory 4 standards.

[redacted]

**Project Scope**

[redacted]

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[redacted]

[redacted]

The scope has been identified below by the various program solutions. An approximate cost breakdown of each program is included in the following table.

| [redacted] - PROGRAMS COST BREAKDOWN (TRANSMISSION) | | |
|---|---|---|
| **Item** | **Description of Programs** | **Cost** |
| 1 | [redacted] | $ 2,971,063.33 |
| 2 | | $ 8,833,583.03 |
| 3 | | $ 4,652,745.77 |
| 4 | | $ 10,476,037.88 |
| 5 | | $ 5,037,657.00 |
| 6 | [redacted] | $ 7,800,768.00 |
| 7 | [redacted] | $ 1,950,000.00 |
| | Project Manager & Support | $ 1,900,145.00 |
| | Contingency | $ 4,700,000.00 |
| | **TOTAL (TRANSMISSION)** | **$ 48,322,000.00** |

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| [redacted] - PROGRAMS COST BREAKDOWN (DISTRIBUTION) | | |
|---|---|---|
| **Item** | **Description of Programs** | **Cost** |
| 1 | [redacted] | $ 2,269,483.00 |
| | Project Manager & Support | $ 7,020.00 |
| | Contingency | $ 100,000.00 |
| | **TOTAL (DISTRIBUTION)** | **$ 2,376,503.00** |

| TOTAL PROJECT COST (TRANSMISSION AND DISTRIBUTION) | | |
|---|---|---|
| | [redacted] | $ 48,322,322.65 |
| | [redacted] | $ 2,376,503.00 |
| | **TOTAL PROJECT (TRANSMISSION AND DISTRIBUTION)** | **$ 50,698,503.00** |

**Transmission project scope breakdown & associated cost:**

[redacted]

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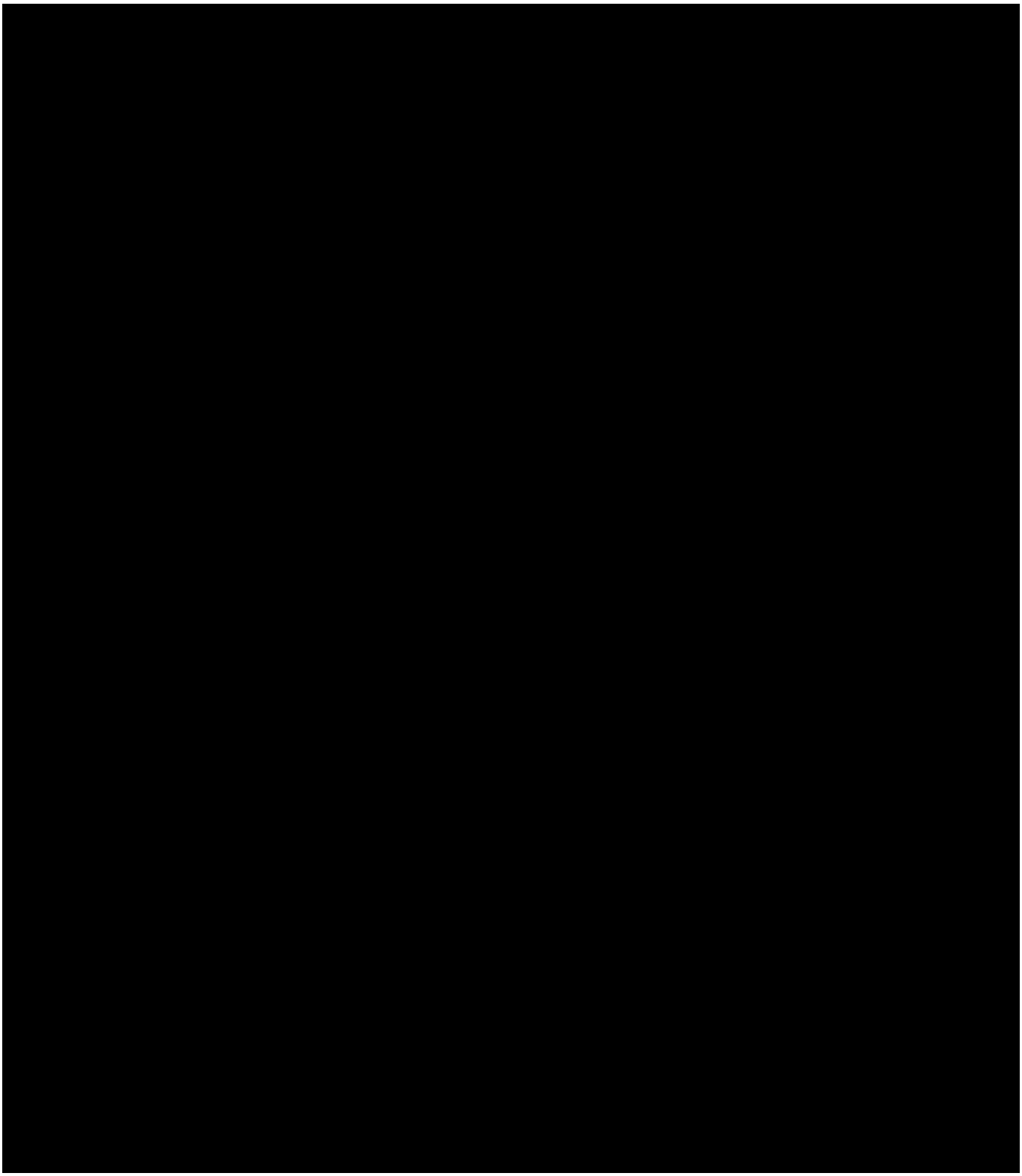

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[redacted]

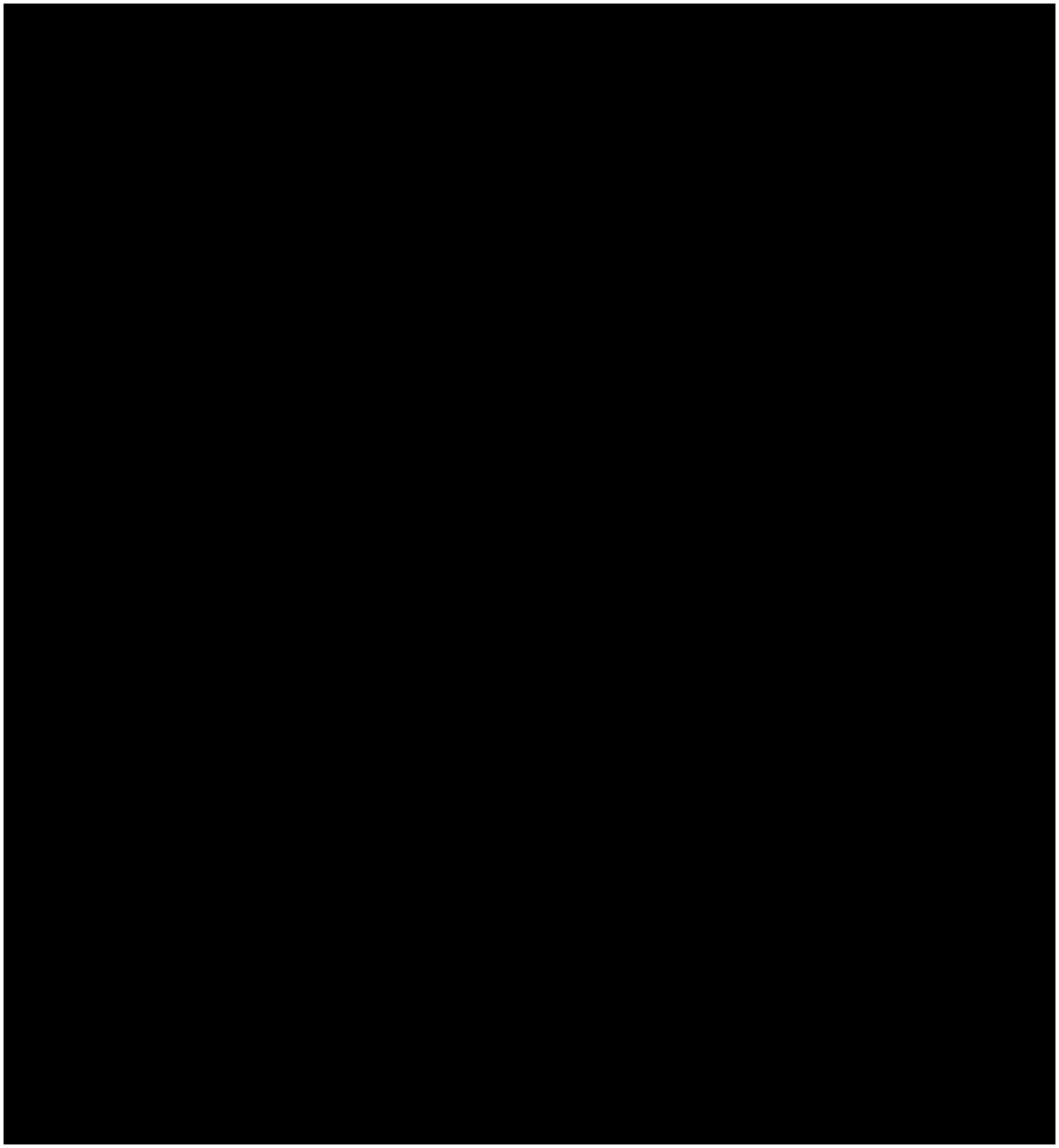

**Figure 1A:** [redacted]

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**Figure 1B:**

**Background / Justification**

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[redacted]

**Business Process and / or Technical Improvements:**

[redacted]

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**Alternatives Considered with Cost Estimates**

[redacted]

**Option 1 –** [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

**Option 2 –** [redacted]

[redacted]

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**Project Schedule**

| Milestone/Phase Name | Estimated Completion Date |
|---|---|
| Engineering | COMPLETE |
| Siting & Environmental approval | COMPLETE |
| Begin Construction | March 2019 |
| Complete Construction | March 2019 thru June 2021 |

**Major Materials**

| Milestone/Phase Name | Estimated Delivery Date |
|---|---|
| 345/115-kV Relay & Control enclosure | May 2019* |
| 345-kV and 115-kV Relay & Control Panels | June 2019* |
| Telecom Tower & Associated components | April 2019* |
| Cochrane Fence | April 2019* |

*Estimated delivery date is based on 03/01/2019 construction start date. If construction start date changes, will have a direct impact to the delivery date of major materials.

**Regulatory Approvals**

[redacted]

**Risks and Risk Mitigation Plans**

[redacted] For specific risks and associated mitigation plans, refer to page 4 (Contingency Risk Assessment).

**References**

[redacted]

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## Project Checklist – Transmission and Substation

**INSTRUCTIONS:**
It is the responsibility of the initiator to contact the area disciplines to determine if the project considerations contained in this list are applicable to their project. They should fill out the checklist and determine a transition plan for the purpose of project execution.

| Checklist for Studies and Processes of a Transmission & Substation Capital Project | | | | |
|---|---|---|---|---|
| **Project Name:** [redacted] | | | | **PAF No: 404578 (T) and CS00335 (D)** |
| **Facility Type:** ☒ BPS ☒ BES ☒ PTF ☐ non-PTF ☒ CIP ☒ Distribution | | | | |
| **PLANNING** | | | | |
| Is a NX-9 required? | | | Yes | |
| Is an ISO-NE PAC presentation required? | | | Yes | |
| Is a PPA required? | | | Yes | |
| Is a TCA Application Required? | | | Yes | |
| **PLANNING/PROTECTION & CONTROLS** | | | | |
| Are RAS/SPS/UVLs affected? | | | No | |
| **OPERATIONS** | | | | |
| Outage Required? | ☒ Primary Equipment (Power Transfer) | ☒ Secondary Equipment (P&C only) | | ☐ Outage Not Required |
| Do SCLL Conditions Exist? | | | Yes | |
| Has an outage schedule been approved? | | | No | |
| Are Operations & Maintenance procedures/training required? | | | No | |
| **STANDARDS** | | | | |
| Does the project include standard equipment and designs? | | | Yes | |
| **SUBSTATION ENGINEERING** | | | | |
| Does this impact Revenue Metering | | | Yes | |
| Is preliminary short circuit/ breaker duty analysis required? | | | No | |
| Are there any changes to the baseline audible noise? | | | No | |
| Is there an impact to the existing ground grid? | | | Yes | |
| Is a Transient Over Voltage (TOV) analysis required? | | | No | |
| **P&C ENGINEERING** | | | | |
| OP-22 - Are PMUs and DDR required? | | | Yes | |
| If BPS, is an NPCC Directory 4 presentation required? | | | Yes | |

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| Checklist for Studies and Processes of a Transmission & Substation Capital Project | |
|---|---|
| **Project Name:** [redacted] | **404578 (T) and CS00335 (D)** |
| **TRANSMISSION LINE ENGINEERING** | |
| Are there any changes that affect the baseline EMF? | No |
| Are there any changes that affect the baseline EMI? | No |
| Is there an impact to the existing ground grid? | Yes |
| **SITING** | |
| Is a Siting filing required? | Yes |
| **PERMITTING** | |
| Is there any permitting required? | Yes |
| **Siting & Construction Services (Outreach)** | |
| What is the level of outreach expected? | Medium |
| **INITIATOR** | |
| Has a field constructability review been completed? | Yes |
| **INVESTMENT RECOVERY** | |
| Does the project require development of an Investment Recovery plan? | Yes |
| **COST ESTIMATING** | |
| How was the cost estimate prepared? | Estimate was prepared by the Eversource Estimating Team |
| Who prepared the estimate? | [redacted] |
| Was the estimate reviewed by Eversource Estimating? | Yes |

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## TRANSMISSION WORK ESTIMATE

ESTIMATE SUMMARY

Project Title: [redacted] Base Case
Project Mgr/Lead: [redacted]
Project Number: 40457801

Estimate By: JET
Date of Estimate: 12/17/2018
ISD: June 2021
Estimate #C-18-324

**ESTIMATE SUMMARY**

**Estimate Type: Planning**

| | TOTAL | % of Total | Prior | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| CONSTRUCTION | $12,390,374 | 25.6% | $112,839 | $265,200 | $5,013,681 | $4,696,511 | $2,302,143 | | |
| ENGINEERING/DESIGN | $2,349,922 | 4.9% | $1,143,802 | $167,400 | $595,130 | $443,590 | | | |
| LAND | | | | | | | | | |
| MATERIAL | $9,714,784 | 20.1% | | $2,940,694 | $3,452,664 | $3,321,426 | | | |
| PROJECT MGR & SUPPORT | $1,900,145 | 3.9% | $103,743 | $107,460 | $665,911 | $665,911 | $357,120 | | |
| REMOVAL | $637,070 | 1.3% | | | | $497,350 | $139,720 | | |
| TEST & LCE | $6,948,880 | 14.4% | | | $1,118,918 | $3,263,440 | $2,566,522 | | |
| CONTINGENCY | $4,700,000 | 9.7% | | $60,600 | $1,282,605 | $1,514,255 | $1,842,541 | | |
| ESCALATION | $468,732 | 1.0% | | | $99,320 | $186,142 | $183,270 | | |
| INDIRECTS | $5,812,422 | 12.0% | $282,849 | $283,862 | $2,054,976 | $2,166,153 | $1,024,582 | | |
| AFUDC | $3,399,718 | 7.0% | $54,281 | $177,979 | $673,115 | $1,293,290 | $1,201,053 | | |
| **Total Cost** | **$48,322,000** | 100.0% | **$1,697,514** | **$4,003,195** | **$14,956,320** | **$18,048,068** | **$9,616,951** | | |

| | | | |
|---|---|---|---|
| | -25% | - | 25% |
| **Planning Range** | **$36,241,500** | - | **$60,402,500** |

COMMENTS:
Project Scope:

[redacted]

**Assumptions/Clarifications;**
Estimate for constr. based on awarded vendors and estimated change order allowances
Cost for Control room building and internals is based on P.O.
ISD of spring 2021
Engineering to be outsourced with in-house review, construction to be outsourced.

**Risk Allowances;**

| | |
|---|---|
| - Encounter unexpected obstructions | $1,640,000.00 |
| - More than estimated Removal and off-site disposal of contaminated materials | $910,000.00 |
| - Alteration of work sequence (by CONVEX/ISO-NE) due to system conditions | $925,000.00 |
| - Engineering change orders | $200,000.00 |
| - Complex outage planning and work sequencing if forced to complete individual breaker outages rather than complete terminal outages | $1,025,000.00 |

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# DISTRIBUTION WORK ESTIMATE

ESTIMATE SUMMARY

Project Title [redacted] Distribution
Project Mgr/Lead [redacted]
Project Number: 40467801
Revision # 02I

Estimate By: JET
Date of Estimate: 12/17/2018
ISD: June 2021
Estimate #C-18-324

## ESTIMATE SUMMARY

Estimate Type: Planning

| | TOTAL | % of Total | Prior | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| Construction | $691,539 | 29.1% | | | $553,231 | $138,308 | | | |
| Engineering / Design | $20,000 | 0.8% | | | $10,000 | $10,000 | | | |
| Land | | | | | | | | | |
| Material | $615,558 | 25.9% | | | $492,446 | $123,112 | | | |
| Project Mgmt. & Sppt. | $7,020 | 0.3% | | $540 | $2,160 | $4,320 | | | |
| Removal | | | | | | | | | |
| Test | | | | | | | | | |
| Risk / Contingency | $100,000 | 4.2% | | | $50,000 | $50,000 | | | |
| Escalation | $53,073 | 2.2% | | | $33,236 | $19,838 | | | |
| Indirects | $756,737 | 31.8% | | $1,180 | $587,655 | $167,902 | | | |
| AFUDC | $132,576 | 5.6% | | $52 | $54,565 | $77,959 | | | |
| Total Cost | $2,376,503 | 100.0% | | $1,772 | $1,783,293 | $591,438 | | | |

Estimate Range: -25% to 25%
$1,780,000 - $2,970,000

COMMENTS:

Project Scope:
[redacted]

Assumptions/Clarifications:
Indirect rates based on; [redacted]
Estimate for constr. based on awarded vendors and estimated change order allowances
Cost for Control room building and internals is based on P.O.
ISD of spring 2021
Engineering to be outsourced with in-house review, construction to be outsourced.

RISKS
Alteration of work sequence due to system conditions $100,000

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# APPENDIX I

Confidential Critical Energy Infrastructure Information (CEII) and or Physical Security Information (PSI) Subject to Protective Order and/or Non-Disclosure Agreement. Do not copy or provide to Unauthorized Persons"

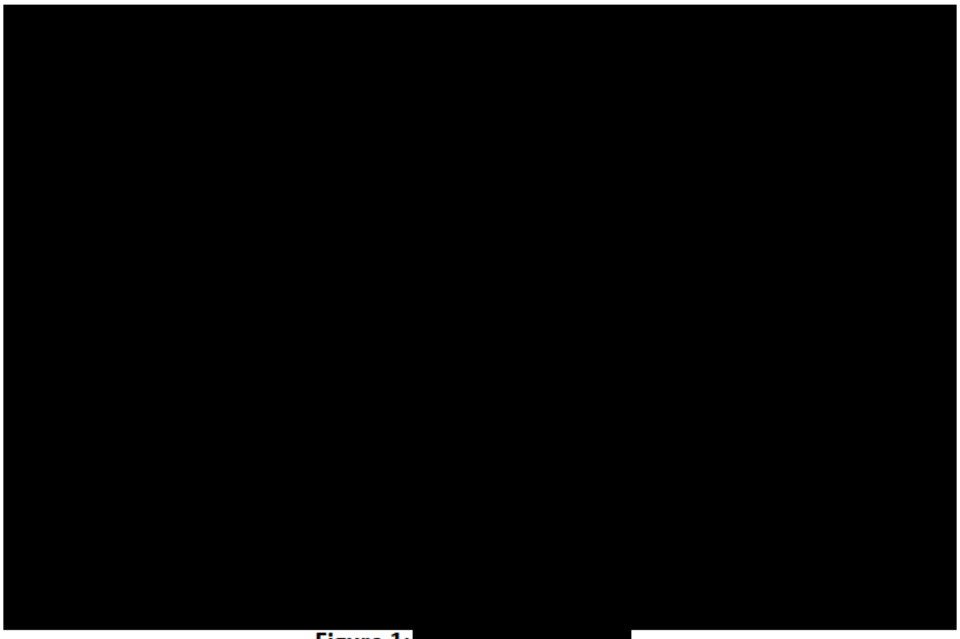

**Figure 1:**



**Figure 2:**

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**Figure 3:**

Confidential Critical Energy Infrastructure Information (CEII) and or Physical Security Information (PSI) Subject to Protective Order and/or Non-Disclosure Agreement. Do not copy or provide to Unauthorized Persons"



**Figure 4:** 345 KV Overhead Cable Tray

"Confidential Critical Energy Infrastructure Information (CEII) and or Physical Security Information (PSI) Subject to Protective Order and/or Non-Disclosure Agreement. Do not copy or provide to Unauthorized Persons"



**Figure 5:** [redacted]

Confidential Critical Energy Infrastructure Information (CEII) and or Physical Security Information (PSI) Subject to Protective Order and/or Non-Disclosure Agreement. Do not copy or provide to Unauthorized Persons"

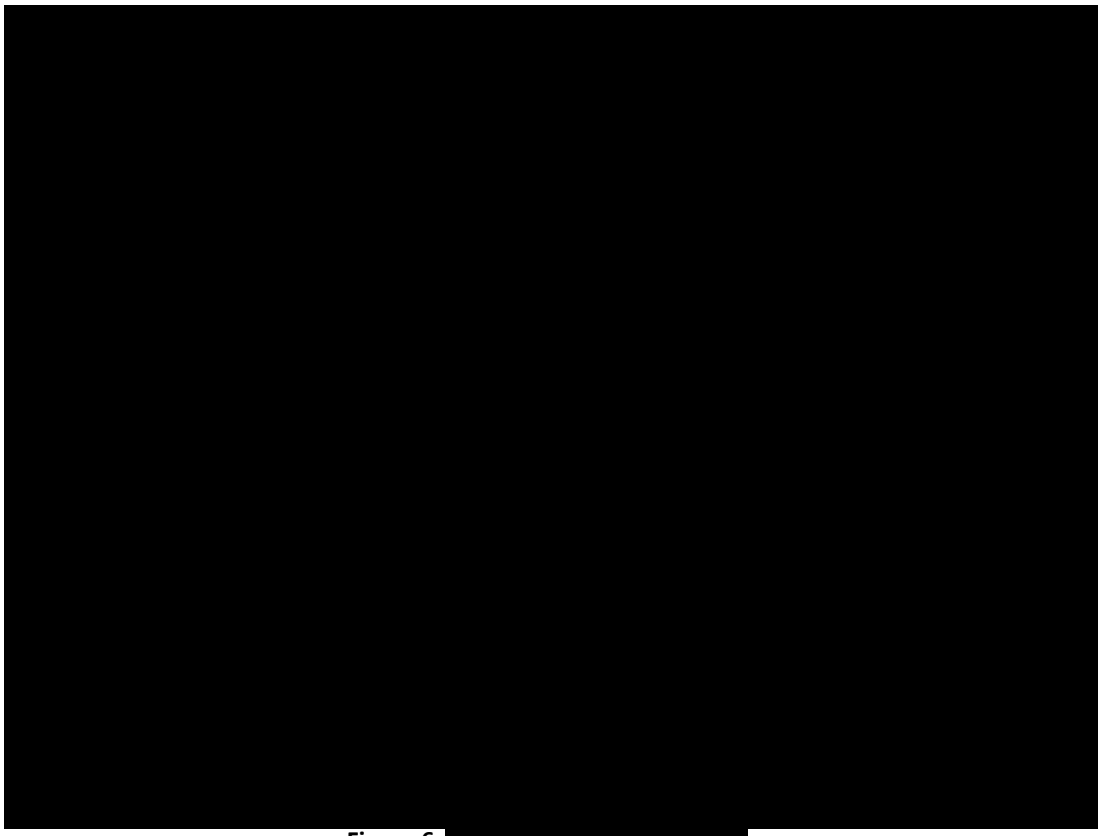

**Figure 6:**

Confidential Critical Energy Infrastructure Information (CEII) and or Physical Security Information (PSI) Subject to Protective Order and/or Non-Disclosure Agreement. Do not copy or provide to Unauthorized Persons"



**Figure 7:** Inside of [redacted] (Figure 6&7)

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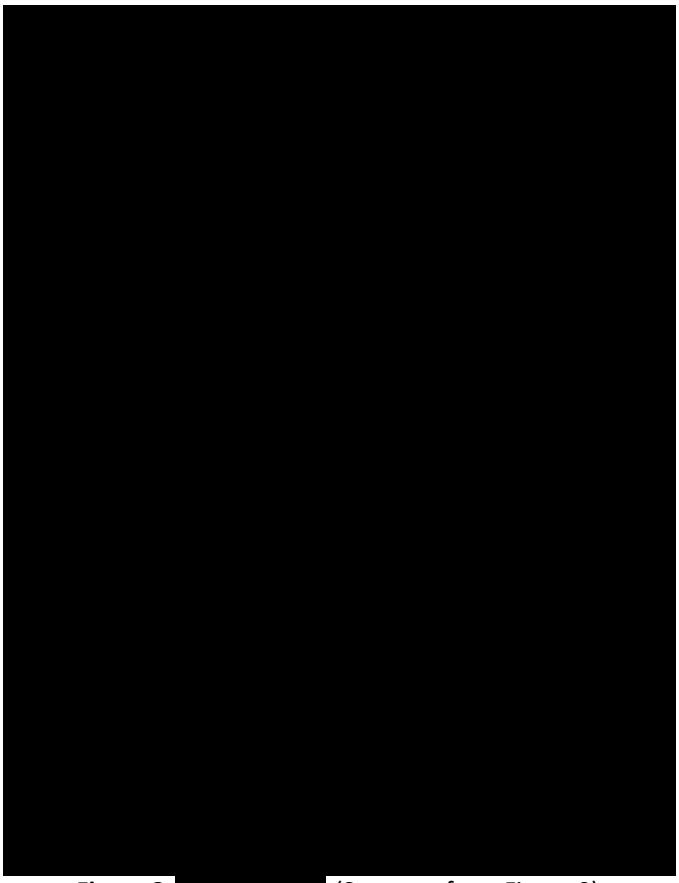

**Figure 8:** (Separate from Figure 9)

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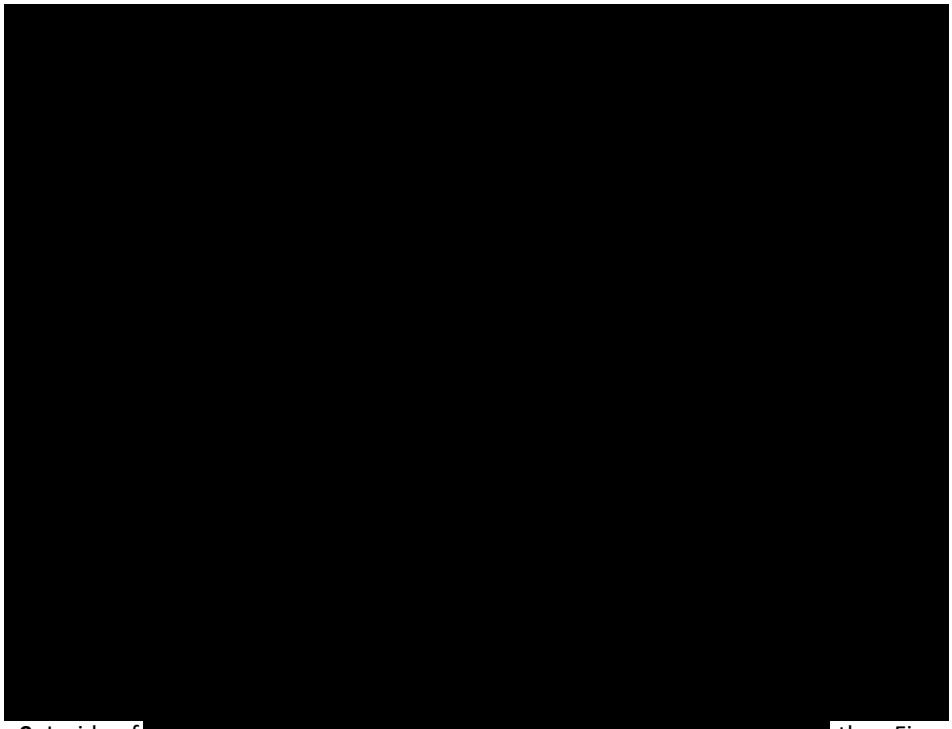

**Figure 9:** Inside of [redacted] than Figure 11)

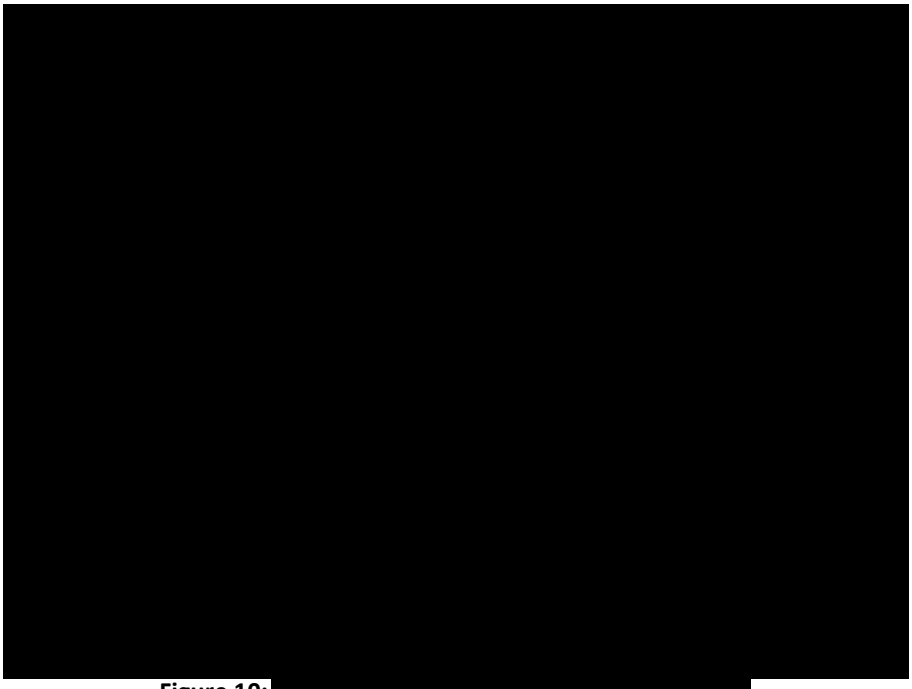

**Figure 10:** [redacted]

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**Figure 11:**



**Figure 12:**