



Resanction Request

Civil contractor

- Contractor bids were higher than estimated, even though lowest bidder was selected for the contract
- Additional physical protection was required for energized cables during vault demolition
- The City of Providence required road repairs that were not part of original scope
- The work site was adjacent to a Federal Courthouse. General Services Administration (GSA) required that all loud construction activities such as driving steel sheets, jackhammering, etc., be done at times when there were no trials. To maintain a productive construction schedule, this work was done at night causing higher labor rates.
- Increased footprint for site fencing was required by sensitivity of Federal Courthouse/GSA to potential security issues
- Winter conditions adders

Environmental remediation (demolition/removal)

- The work site was adjacent to Federal Courthouse. GSA required that all loud demolition and removal activities be done at times when there were no trials. To maintain a productive construction schedule, this work was done at night.

2.7 If cost > approved Business Plan how will this be funded?

Reallocation of funds within the portfolio has been managed by Resource Planning to meet jurisdictional, budgetary, statutory and regulatory requirements.

2.8 Key Milestones

| Milestone | Target Date: (Month/Year) |
|-----------------------|---------------------------|
| Partial Sanction | May 2009 |
| Project Sanction | March 2014 |
| Re-Sanction | May 2017 |
| Construction Complete | June 2017 |

2.9 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| September 2017 | Closure Paper |



Resanction Request

3 Statements of Support

3.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-------------------------------|-------------------|----------------------------------------------------------------------|
| Investment Planning | Glen Diconza | Endorses relative to distribution 5-year plan or emergent work |
| Resource Planning | Anne Wyman | Endorses Resources, cost estimate, schedule, and Portfolio Alignment |
| Distribution Asset Management | Alan Labarre | Endorses scope, design, conformance with design standards |

3.2 Reviewers

The reviewers have provided feedback on the content/language of the paper


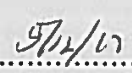
| Function | Individual |
|-----------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional | Sonny Anand |
| Procurement | Art Curran |
| Control Center | Mike Gallagher |

Resanction Request



4 Decisions

- I:
- (a) APPROVE this paper and the investment of \$1.497M and a tolerance of +/- 10%
 - (b) NOTE that Heather L. Moran is the Program Manager and has the approved financial delegation.

Signature..........Date..........
Executive Sponsor – Christopher Kelly, SVP of Electric Process and Engineering



Resanction Request

5 Appendices

NA

C033535

Johnston Sub 12.47 kV Expansion

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------|----------------------------------------|
| Fund Project Number: <u>C033535</u> | USSC #: <u>USSC0110W259 v3C</u> |
| Revision: <u>12</u> | Budget Version: |
| Project Title: <u>Johnston Sub 12.47 kV Expansion</u> | |
| Project Description: Johnston Sub 12.47 kV Expansion of New yard | |

| | |
|---------------------------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>HURLEY, KATHLEEN</u> | Initiator: <u>Karzenski, Wayne</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>35</u> | Project Complexity Score: <u>23</u> |

Project Schedule / Expenditures

| | |
|----------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>9/3/2009</u> | Est Complete Date: <u>9/30/2015</u> |
| Est In-Service Date: <u>9/30/2015</u> | |
| TTD Actuals: <u>\$4,788,681</u> | As Of: <u>10/2/2017</u> |

| | | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|-----------------------|
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$4,579,000</u> | <u>\$10,000</u> | <u>\$200,000</u> | <u>\$4,789,000</u> | <u>\$0</u> |

Justification / Risk Identification:

This project is being moved forward because of the failure of the #2 Transformer at Johnston and the subsequent loss of 12.47 kV supply to the old switchgear.

Initial strategy request is for preliminary engineering only. Project will be submitted for sanction approval following preliminary engineering.

DOA letterhead with DOIC stamp 9-10-2010

Project Scope:

The new bus at Johnston was build with the expectation that all feeders would eventually be relocated to it. The old 12.47 kV utilized obsolete equipment that would eventually need to be replaced. Failure of the #2 transformer has expedited the need for transition to the new switchgear.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>1/28/2017 18:27:25</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C033535 Current Total Authorized Amount: \$4,78,...

Title Johnston Sub 12.47 kV Expansion

Project Number C033535

Budget Version No Assigned Versions

Revision Closure

Revision Status Approved

Revision No. 12

Est Start Date 09/03/2009

Est Complete Date 09/30/2015

Est In Svc Date 09/30/2015

Capital \$4,579,000.00

Expense \$10,000.00

Jobbing \$0.00

Retirement \$0.00

Removal \$200,000.00

Total (excl. Rets.) \$4,789,000.00

Credits \$0.00

Net \$4,789,000.00

Revision Info Other Updates

Revision 12 of 12 [K] < > >I

[Find Revision](#) Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from W/O

Copy Estimate

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record 1 of 1 [K] < > >I

Audits

This document has been reviewed for Critical Energy Infrastructure Information (CEII). 1/26/2017



USSC Closure Paper

| | | | |
|---------------------------|------------------------------------|--------------------------|----------------------------------------------|
| Title: | Johnston #18 Substation | Sanction Paper #: | USSC0110W259 v3C |
| Project #: | C033535, C034002, C028884, C036072 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | January 11, 2017 |
| Author: | Kathleen Hurley | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Kathleen Hurley |

1 Executive Summary

This paper is presented to close the Johnston #18 Substation Project, the funding numbers consists of: C033535, C034002, C028884 and C036072. The total spend was \$8.203M. The latest sanctioned amount for this project was \$8.138M.

The original requested sanction amount was \$7.345M.

The final spend amount is \$8.203M broken down into:

\$6.515M Capex
\$0.078M Opex
\$0.752M Removal

2 Project Summary

This project replaced the No. 3 Transformer at the Johnston Substation, installed three feeder positions and retired and removed all equipment in the old 12.47 kV substation.

The project consisted of the following activities:

- Completed a 3rd bay by adding a second feeder position, this consisted of a feeder breaker, regulators, switches, relays, control and other associated equipment.
- Added a 4th and 5th bay consisting of a tie breaker and two feeder positions.
- Added two substation capacitor banks.
- Installed the underground ducts and cables to the new feeder position.
- Replaced the existing No.3 Transformer with a newer unit rated at 33/44/55 MVA.
- Retired and removed all equipment in the old 12.47 kV substation.

USSC Closure Paper



3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|---------------------------------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C033535 | Johnston Substation Work and Retirement of the old Substation | Capex | 4.579 |
| | | Opex | 0.010 |
| | | Removal | 0.200 |
| | | Total | 4.789 |
| Project # | Description | | Total Spend |
| C034002 | Johnston Sub 12kV Expansion Getaways | Capex | 0.317 |
| | | Opex | 0.007 |
| | | Removal | 0.016 |
| | | Total | 0.340 |
| Project # | Description | | Total Spend |
| C028884 | Johnston 18F10 Feeder Installation | Capex | 0.848 |
| | | Opex | 0.067 |
| | | Removal | 0.164 |
| | | Total | 1.079 |
| Project # | Description | | Total Spend |
| C036072 | Johnson T#3 Replacement | Capex | 1.989 |
| | | Opex | 0.005 |
| | | Removal | 0.001 |
| | | Total | 1.995 |
| Total | | Capex | 7.733 |
| | | Opex | 0.089 |
| | | Removal | 0.381 |
| | | Total | 8.203 |

USSC Closure Paper



| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 6.515 |
| | | Opex | 0.078 |
| | | Removal | 0.752 |
| | | Total Cost | 7.345 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (1.218) |
| | | Opex | (0.011) |
| | | Removal | 0.371 |
| | | Total Variance | (0.858) |

3.2 Analysis

The original design called for removing all protection on the 13kV tertiary winding because all load was being removed from that winding. However, because it is a delta winding, a ground fault protection was required to detect ground faults on the 13kV winding.

This issue was caught in the field, reviewed by the team and was added to the scope after the design and estimate had been approved. A PCR was created for this change.

4 Improvements / Lessons Learned

Lessons Learned: The original design called for removing all protection on the 13kV tertiary winding because all load was being removed from that winding. However, because it is a delta winding, ground fault protection was required. This issue was caught in the field, reviewed by the team and added to the scope after the design and estimate had been approved.

A thorough design review including input from all team members should be held prior to issuing for construction to prevent any potential design work from being overlooked or omitted prior to the construction phase.

Please refer to ID #480 in the Lessons Learned Database.

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|---------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

| | |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|------------------------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | DiConza, Glen/ Park, Michelle | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Wyman, Anne/ Philips, Mark | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Hayduk, Brian/ Labarre, Alan T. | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Martuscello, Suzan E. | Endorses scope, design, conformance with design standards |
| Project Management | Schneller, Andrew | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Simonds, Jammie | Endorses Cost Estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|------------|---------------------------------|
| Finance | Easterly Patricia/Helm, Richard |
| Regulatory | Zschokke, Peter |

USSC Closure Paper



| | |
|----------------------------|------------------------------------|
| Jurisdictional Delegate(s) | Patterson Jim/ Terron Hill |
| Procurement | Curran, Art |
| Control Centers (CC) | Gallagher Michael Houston, Will |

USSC Closure Paper



7 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on January 11, 2017.

Signature.....*Ch. A*.....Date.....*1/23/17*.....

Christopher Kelly

Acting Senior Vice President Electric Process and Engineering

C034002

Johnston Sub 12kV Expansion Getawa.

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|---------------------------------------------------------------------|----------------------------------------|
| Fund Project Number: <u>C034002</u> | USSC #: <u>USSC0110W259 v3C</u> |
| Revision: <u>9</u> | Budget Version: |
| Project Title: <u>Johnston Sub 12kV Expansion Getawa.</u> | |
| Project Description: Johnston Sub 12.47 kV Epansion Getaways | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>HURLEY, KATHLEEN</u> | Initiator: <u>Karzenski, Wayne</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>35</u> | Project Complexity Score: <u>23</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|--------------|----------------|------------------|----------------|-----------------|------------------|------------|
| Est Start Date: <u>2/1/2009</u> | Est Complete Date: <u>9/30/2015</u> | | | | | | | | | | |
| Est In-Service Date: <u>9/30/2015</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$339,909</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$317,000</u></td> <td><u>\$7,000</u></td> <td><u>\$16,000</u></td> <td><u>\$340,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$317,000</u> | <u>\$7,000</u> | <u>\$16,000</u> | <u>\$340,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$317,000</u> | <u>\$7,000</u> | <u>\$16,000</u> | <u>\$340,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

This is an associated project to C33535 for the relocation of feeder from the old 12 kV switchgear to the new switchgear. It will cover the underground getaway relocation cost. The failure of the 3- winding Johnston #2 transformer eliminated one of two supplies to the old Johnston 12.47 kV switchgear. A tie to the new 12.47 switchgear has been built to temporarily support the load. The recommended plan is to relocate the 3 remaining feeder to the new 12.47 kV switchgear.

Project Scope:

<Enter data here>

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Total DOA \$0.0695M over 4 projects 4443,3435,4415 and DxT 4442.

USSC0110W259 v2: C036072 \$1.000M; C033535 \$290K; C034002 \$260K; C028884 \$720K.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>1/28/2017 18:27:29</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C034002 Current Total Authorized Amount: \$340,000.00

Title Johnston Sub 12kV Expansion Getawa.
Project Number C034002

Budget Version No Assigned Versions

Revision Closure
Revision Status Approved
Revision No. 9
Est Start Date 02/01/2009
Est Complete Date 09/30/2015
Est In Srvc Date 09/30/2015
Capital \$317,000.00
Expense \$7,000.00
Jobbing \$0.00
Retirement \$0.00
Removal \$16,000.00
Total (excl. Rets.) \$340,000.00
Credits \$0.00
Net \$340,000.00

Revision Info Other Updates

Revision 9 of 9
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

This document has been reviewed for Critical Energy
Infrastructure Information (CEII). 1/26/2017



USSC Closure Paper

| | | | |
|---------------------------|---------------------------------------|--------------------------|-------------------------------------------------------|
| Title: | Johnston #18 Substation | Sanction Paper #: | USSC0110W259 v3C |
| Project #: | C033535, C034002, C028884, C036072 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | January 11, 2017 |
| Author: | Kathleen Hurley | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Kathleen Hurley |

1 Executive Summary

This paper is presented to close the Johnston #18 Substation Project, the funding numbers consists of: C033535, C034002, C028884 and C036072. The total spend was \$8.203M. The latest sanctioned amount for this project was \$8.138M.

The original requested sanction amount was \$7.345M.

The final spend amount is \$8.203M broken down into:

\$6.515M Capex
\$0.078M Opex
\$0.752M Removal

2 Project Summary

This project replaced the No. 3 Transformer at the Johnston Substation, installed three feeder positions and retired and removed all equipment in the old 12.47 kV substation.

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- Retired and removed all equipment in the old 12.47 kV substation.

USSC Closure Paper



3 Over / Under Expenditure Analysis

3.1 Summary Table

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|-----------------------|---------------------------------------------------------------|---------|-------------|
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| | | Opex | 0.010 |
| | | Removal | 0.200 |
| | | Total | 4.789 |
| Project # | Description | | Total Spend |
| C034002 | Johnston Sub 12kV Expansion Getaways | Capex | 0.317 |
| | | Opex | 0.007 |
| | | Removal | 0.016 |
| | | Total | 0.340 |
| Project # | Description | | Total Spend |
| C028884 | Johnston 18F10 Feeder Installation | Capex | 0.848 |
| | | Opex | 0.067 |
| | | Removal | 0.164 |
| | | Total | 1.079 |
| Project # | Description | | Total Spend |
| C036072 | Johnson T#3 Replacement | Capex | 1.989 |
| | | Opex | 0.005 |
| | | Removal | 0.001 |
| | | Total | 1.995 |
| Total | | Capex | 7.733 |
| | | Opex | 0.089 |
| | | Removal | 0.381 |
| | | Total | 8.203 |

USSC Closure Paper



| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 6.515 |
| | | Opex | 0.078 |
| | | Removal | 0.752 |
| | | Total Cost | 7.345 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (1.218) |
| | | Opex | (0.011) |
| | | Removal | 0.371 |
| | | Total Variance | (0.858) |

3.2 Analysis

The original design called for removing all protection on the 13kV tertiary winding because all load was being removed from that winding. However, because it is a delta winding, a ground fault protection was required to detect ground faults on the 13kV winding.

This issue was caught in the field, reviewed by the team and was added to the scope after the design and estimate had been approved. A PCR was created for this change.

4 Improvements / Lessons Learned

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A thorough design review including input from all team members should be held prior to issuing for construction to prevent any potential design work from being overlooked or omitted prior to the construction phase.

Please refer to ID #480 in the Lessons Learned Database.

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|---------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

| | |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|------------------------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | DiConza, Glen/ Park, Michelle | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Wyman, Anne/ Philips, Mark | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Hayduk, Brian/ Labarre, Alan T. | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Martuscello, Suzan E. | Endorses scope, design, conformance with design standards |
| Project Management | Schneller, Andrew | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Simonds, Jammie | Endorses Cost Estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|------------|---------------------------------|
| Finance | Easterly Patricia/Helm, Richard |
| Regulatory | Zschokke, Peter |

USSC Closure Paper



| | |
|----------------------------|------------------------------------|
| Jurisdictional Delegate(s) | Patterson Jim/ Terron Hill |
| Procurement | Curran, Art |
| Control Centers (CC) | Gallagher Michael Houston, Will |

USSC Closure Paper



7 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on January 11, 2017.

Signature..........Date..........

Christopher Kelly

Acting Senior Vice President Electric Process and Engineering

C035087

DOTR-Apponaug Circulator Imprv Warw

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|----------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C035087</u> | USSC #: <u>USSC-14-073</u> |
| Revision: <u>5</u> | Budget Version: <u>Default</u> |
| Project Title: <u>DOTR-Apponaug Circulator Imprv Warw</u> | |
| Project Description: DOTR-Apponaug Circulator Longterm Improvements | |

| | |
|-------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>CAPOBIANCO, THOM</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>Customer Request/Public Require</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Public Requirements</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>49</u> | Project Complexity Score: <u>18</u> |

Project Schedule / Expenditures

| | | | | | |
|-----------------------------------------------|--------------------------------------------|-----------------------|-----------------------|---------------------|-----------------------|
| Revision Status: <u>Approved</u> | | | | | |
| Est Start Date: <u>1/28/2010</u> | Est Complete Date: <u>4/30/2018</u> | | | | |
| Est In-Service Date: <u>10/31/2017</u> | | | | | |
| TTD Actuals: <u>\$1,536,182</u> | As Of: <u>10/2/2017</u> | | | | |
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$1,213,000</u> | <u>\$144,000</u> | <u>\$522,000</u> | <u>\$1,879,000</u> | <u>\$0</u> |

Justification / Risk Identification:

Project Scope:

DOTR-Apponaug Circulator Longterm Improvements

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Sanction from \$70K to \$200K from Julie Spaziano. This project was approved for 70k for Preliminary Engineering. This reauthorization is for the remaining 130k to complete the Final Engineering. The total cost for all Engineering and Design will be 200k.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|--------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>4/1/2014 15:58:01</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C035087 Current Total Authorized Amount: \$1,87...

Title: DOTR-Apponaug Circulator Imprv Warw
Project Number: C035087

Budget Version Default [active]
Revision: 14-073
Revision Status: Approved
Revision No.: 5
Est Start Date: 01/28/2010
Est Complete Date: 04/30/2018
Est In Srvc Date: 10/31/2017
Capital: \$1,213,000.00
Expense: \$144,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$522,000.00
Total (excl. Rets.): \$1,879,000.00
Credits: \$0.00
Net: \$1,879,000.00

Revision Info: Other Updates

Revision: 5 of 5
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record: 1 of 1
Audits

Close

D



Short Form Sanction Paper

| | | | |
|---------------------------|-----------------------------------------------------------|--------------------------|----------------------------------------------------|
| Title: | RI DOT Apponaug Circulator Longterm Improvements, Warwick | Sanction Paper #: | USSC-14-073 |
| Project #: | C035087 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 3/31/14 |
| Author: | Thomas Capobianco | Sponsor: | Cheryl A. Warren – Vice President Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Thomas Capobianco |

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of C035087 in the amount \$1.879M with a tolerance of +/- 10% for the purposes of Final Engineering, Procurement of Material, Procurement of Civil and Substation Fence contractors, and the start of construction.

This sanction amount is \$1.879M broken down into:

- \$1.183M Capex
- \$0.144M Opex
- \$0.552M Removal
- With Reimbursement of \$1.879M (100%)

1.2 Project Summary

The State of Rhode Island received federal funding for improvements to Apponaug Circulator. RI DOT work includes but is not limited to construction of five (5) new roundabouts, the construction of a new roadway (Veterans Memorial Drive Extension), conversion of roadways from one-way traffic to two-way traffic; relocation of Apponaug River, and Apponaug Mill Bridge No. 138 reconstruction. This RI DOT sponsored project is the primary driver of this work and is 100% reimbursable.

2 Project Detail

RI DOT has proposed 6 construction phases to accommodate circulator reconstruction. There are 98 pole relocations. This project will fund the associated distribution line work for these 98 pole relocations.



Short Form Sanction Paper

The scope of the civil work will involve primary riser relocation at Pole # 13-75 Diamond Hill Road for a commercial building.

The scope of the substation fence contractor will involve a temporary and permanent relocation of approximately 195 feet of Apponaug Substation fence to accommodate roadway reconstruction.

2.1 Background

National Grid currently has the 3F1, 3F2, 14F1, 14F2, 22F2 overhead distribution circuits and 2262 and 2264 overhead distribution supply circuits impacted by RI DOT circulator construction.

2.2 Drivers

The driver for this project is RI DOT.

2.3 Project Description

National Grid's work is divided between 11 work requests based on proposed 6 construction phases. RI DOT and their construction contractor to determine our sequence of construction for these work requests.

2.4 Benefits

Not Applicable

2.5 Business & Customer Issues

Customer outages may be required for various pole relocations.

2.6 Alternatives

Alternative 1:

This project is mandatory. There are no viable alternatives to the proposed project.

2.7 Investment Recovery

This project is federally funded and is 100% reimbursable. RI DOT will be reimbursing National Grid.

2.7.1 Customer Impact

This project is being fully reimbursed by the RI DOT and is not expected to increase the company's revenue requirement.



Short Form Sanction Paper

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

| Project Number | Project Type (Elec only) | Project Title | Estimate Amount (\$M) |
|----------------|-----------------------------|---------------------------------------------|--------------------------|
| C035087 | D-Line | RI DOT Apponaug Circulator Longterm Improve | 1.879 |
| Total | | | 1.879 |

3.2 Associated Projects

Not Applicable.

3.3 Prior Sanctioning History

Describe previous sanctions for the projects included in the scope of this paper (Newest to Oldest).

| Date | Governance Body | Sanctioned Amount | Paper Title | Sanction Type |
|-----------|-------------------------|----------------------------------|-------------------------------------------|---------------|
| 1/29/2010 | Powerplant DOA (<1M) | \$70k for pre- engineering | DOTR-Apponaug Circulator Imprv Warw | Design only |

3.4 Category

| Category | Reference to Mandate, Policy, or NPV Assumptions |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <input checked="" type="radio"/> Mandatory <input type="radio"/> Policy- Driven <input type="radio"/> Justified NPV | State mandated obligation |

3.5 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☒ Not Policy Driven



Short Form Sanction Paper

3.6 Complexity Level

☐ High Complexity ☐ Medium Complexity ☒ Low Complexity ☐ N/A

Complexity Score: 18

4 Financial

4.1 Business Plan

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|
| Mandatory Public Requirement | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | 0.367 |

4.1.1 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio will be managed by Resource Planning to meet jurisdictional budgetary, statutory, and regulatory requirements.

4.2 CIAC / Reimbursement

| \$M | Prior Yrs | Yr. 1 2014/15 | Yr. 2 2015/16 | Yr. 3 2016/17 | Yr. 4 2017/18 | Yr. 5 2018/19 | Yr. 6 + 2019/20 | Total |
|--------------------|-----------|------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| CIAC/Reimbursement | 0.000 | 0.800 | 0.720 | 0.359 | 0.000 | 0.000 | 0.000 | 1.879 |

4.3 Cost Summary Table

| | | | | | Current Planning Horizon (\$M) | | | | | | |
|------------------------|-----------------------------------------------------------|----------------------------|---------|-----------|--------------------------------|---------|---------|---------|---------|---------|-------|
| Project Number | Project Title | Project Estimate Level (%) | Spend | Prior Yrs | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | Total |
| | | | | | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | |
| C035087 | RI DOT Apponaug Circulator Longterm Improvements, Warwick | Est Lvl (e.g. +/- 10%) | CapEx | 0.078 | 0.504 | 0.504 | 0.127 | - | - | - | 1.213 |
| | | | OpEx | - | 0.064 | 0.064 | 0.016 | - | - | 0.144 | |
| | | | Removal | - | 0.232 | 0.232 | 0.058 | - | - | 0.522 | |
| | | | Total | 0.078 | 0.800 | 0.800 | 0.201 | - | - | 1.879 | |
| Total Project Sanction | | | CapEx | 0.078 | 0.504 | 0.504 | 0.127 | - | - | - | 1.213 |
| | | | OpEx | - | 0.064 | 0.064 | 0.016 | - | - | 0.144 | |
| | | | Removal | - | 0.232 | 0.232 | 0.058 | - | - | 0.522 | |
| | | | Total | 0.078 | 0.800 | 0.800 | 0.201 | - | - | 1.879 | |



Short Form Sanction Paper

4.4 Project Budget Summary Table

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| | | Yr. 1 2014/15 | Yr. 2 2015/16 | Yr. 3 2016/17 | Yr. 4 2017/18 | Yr. 5 2018/19 | Yr. 6 + 2019/20 | |
| CapEx | 0.078 | 0.450 | 0.282 | 0.215 | 0.000 | 0.000 | 0.000 | 1.025 |
| OpEx | 0.000 | 0.113 | 0.042 | 0.032 | 0.000 | 0.000 | 0.000 | 0.187 |
| Removal | 0.000 | 0.225 | 0.042 | 0.032 | 0.000 | 0.000 | 0.000 | 0.300 |
| Total Cost in Bus. Plan | 0.078 | 0.788 | 0.367 | 0.280 | 0.000 | 0.000 | 0.000 | 1.512 |

Variance (Business Plan-Project Estimate)

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|---------|
| | | Yr. 1 2014/15 | Yr. 2 2015/16 | Yr. 3 2016/17 | Yr. 4 2017/18 | Yr. 5 2018/19 | Yr. 6 + 2019/20 | |
| CapEx | 0.000 | (0.054) | (0.222) | 0.088 | 0.000 | 0.000 | 0.000 | (0.188) |
| OpEx | 0.000 | 0.049 | (0.022) | 0.016 | 0.000 | 0.000 | 0.000 | 0.043 |
| Removal | 0.000 | (0.007) | (0.190) | (0.026) | 0.000 | 0.000 | 0.000 | (0.223) |
| Total Cost in Bus. Plan | 0.000 | (0.013) | (0.433) | 0.078 | 0.000 | 0.000 | 0.000 | (0.367) |

5 Key Milestones

| Milestone | Target Date: (Month/Year) |
|-----------------------------------|------------------------------|
| Engineering Design Complete (EDC) | 2/2014 |
| Project Sanction | 3/2014 |
| Construction Start | 4/2014 |
| Construction Complete | 10/2017 |
| Project Closure Sanction | 4/2018 |

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Role | Individual | Responsibilities |
|------------------------|---------------|----------------------------|
| Investment Planner | Glen DiConza | Distribution – New England |
| Resource Planning | Jim Patterson | Distribution – New England |
| Engineering and Design | Al Labarre | Distribution Line Planning |
| Project Management | Timothy Moore | T&D Line NE |

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Reviewer List | Individual |
|--------------------------|----------------------|
| Finance | Keith Fowler |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegates | Jennifer L. Grimsley |
| Procurement | Art Curran |
| Control Centers (CC) | Michael Gallagher |




Short Form Sanction Paper

7 Decisions

I:

(a) APPROVE this paper and the investment of \$1.879M and a tolerance of +/-10%

(b) NOTE that Thomas Capobianco is the Project Manager and has the approved financial delegation.

Signature..........Date.....

Marie Jordan
Senior Vice-President, Network Strategy



Short Form Sanction Paper

8 Other Appendices



8.1 Sanction Request Breakdown by Project

Not Applicable.

C036072

Johnston #18 Substation Expansion

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|----------------------------------------------------------------|----------------------------------------|
| Fund Project Number: <u>C036072</u> | USSC #: <u>USSC0110W259 v3C</u> |
| Revision: <u>7</u> | Budget Version: |
| Project Title: <u>Johnston #18 Substation Expansion</u> | |
| Project Description: Johnston #18 Substation Expansion | |

| | |
|---------------------------------------------------------------------|-----------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>HURLEY, KATHLEEN</u> | Initiator: <u>Soko, Soma Ghorai</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Dist by Transmission Sub RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>35</u> | Project Complexity Score: <u>23</u> |

Project Schedule / Expenditures

| | | | | | |
|----------------------------------------------|--------------------------------------------|-----------------------|-----------------------|---------------------|-----------------------|
| Revision Status: <u>Approved</u> | | | | | |
| Est Start Date: <u>8/1/2010</u> | Est Complete Date: <u>9/30/2015</u> | | | | |
| Est In-Service Date: <u>9/30/2015</u> | | | | | |
| TTD Actuals: <u>\$1,994,316</u> | As Of: <u>10/2/2017</u> | | | | |
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$1,989,000</u> | <u>\$5,000</u> | <u>\$1,000</u> | <u>\$1,995,000</u> | <u>\$0</u> |

Justification / Risk Identification:

<Enter data here>

Project Scope:

Johnston #18 Substation Expansion

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>1/30/2017 07:52:13</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C036072 Current Total Authorized Amount: \$1,99...

Title Johnston #18 Substation Expansion
Project Number C036072

Budget Version No Assigned Versions

Revision Closure
Revision Status Approved
Revision No. 7
Est Start Date 08/01/2010
Est Complete Date 09/30/2015
Est In Srvc Date 09/30/2015

Capital \$1,989,000.00
Expense \$5,000.00
Jobbing \$0.00
Retirement \$0.00
Removal \$1,000.00
Total (excl. Rets.) \$1,995,000.00
Credits \$0.00
Net \$1,995,000.00

Revision Info Other Updates

Revision 7 of 7
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

This document has been reviewed for Critical Energy
Infrastructure Information (CEII). 1/26/2017



USSC Closure Paper

| | | | |
|---------------------------|---------------------------------------|--------------------------|-------------------------------------------------------|
| Title: | Johnston #18 Substation | Sanction Paper #: | USSC0110W259 v3C |
| Project #: | C033535, C034002, C028884, C036072 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | January 11, 2017 |
| Author: | Kathleen Hurley | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Kathleen Hurley |

1 Executive Summary

This paper is presented to close the Johnston #18 Substation Project, the funding numbers consists of: C033535, C034002, C028884 and C036072. The total spend was \$8.203M. The latest sanctioned amount for this project was \$8.138M.

The original requested sanction amount was \$7.345M.

The final spend amount is \$8.203M broken down into:

\$6.515M Capex
\$0.078M Opex
\$0.752M Removal

2 Project Summary

This project replaced the No. 3 Transformer at the Johnston Substation, installed three feeder positions and retired and removed all equipment in the old 12.47 kV substation.

The project consisted of the following activities:

- Completed a 3rd bay by adding a second feeder position, this consisted of a feeder breaker, regulators, switches, relays, control and other associated equipment.
- Added a 4th and 5th bay consisting of a tie breaker and two feeder positions.
- Added two substation capacitor banks.
- Installed the underground ducts and cables to the new feeder position.
- Replaced the existing No.3 Transformer with a newer unit rated at 33/44/55 MVA.
- Retired and removed all equipment in the old 12.47 kV substation.

USSC Closure Paper



3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|---------------------------------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C033535 | Johnston Substation Work and Retirement of the old Substation | Capex | 4.579 |
| | | Opex | 0.010 |
| | | Removal | 0.200 |
| | | Total | 4.789 |
| Project # | Description | | Total Spend |
| C034002 | Johnston Sub 12kV Expansion Getaways | Capex | 0.317 |
| | | Opex | 0.007 |
| | | Removal | 0.016 |
| | | Total | 0.340 |
| Project # | Description | | Total Spend |
| C028884 | Johnston 18F10 Feeder Installation | Capex | 0.848 |
| | | Opex | 0.067 |
| | | Removal | 0.164 |
| | | Total | 1.079 |
| Project # | Description | | Total Spend |
| C036072 | Johnson T#3 Replacement | Capex | 1.989 |
| | | Opex | 0.005 |
| | | Removal | 0.001 |
| | | Total | 1.995 |
| Total | | Capex | 7.733 |
| | | Opex | 0.089 |
| | | Removal | 0.381 |
| | | Total | 8.203 |

USSC Closure Paper



| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 6.515 |
| | | Opex | 0.078 |
| | | Removal | 0.752 |
| | | Total Cost | 7.345 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (1.218) |
| | | Opex | (0.011) |
| | | Removal | 0.371 |
| | | Total Variance | (0.858) |

3.2 Analysis

The original design called for removing all protection on the 13kV tertiary winding because all load was being removed from that winding. However, because it is a delta winding, a ground fault protection was required to detect ground faults on the 13kV winding.

This issue was caught in the field, reviewed by the team and was added to the scope after the design and estimate had been approved. A PCR was created for this change.

4 Improvements / Lessons Learned

Lessons Learned: The original design called for removing all protection on the 13kV tertiary winding because all load was being removed from that winding. However, because it is a delta winding, ground fault protection was required. This issue was caught in the field, reviewed by the team and added to the scope after the design and estimate had been approved.

A thorough design review including input from all team members should be held prior to issuing for construction to prevent any potential design work from being overlooked or omitted prior to the construction phase.

Please refer to ID #480 in the Lessons Learned Database.

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|---------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

| | |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|------------------------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | DiConza, Glen/ Park, Michelle | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Wyman, Anne/ Philips, Mark | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Hayduk, Brian/ Labarre, Alan T. | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Martuscello, Suzan E. | Endorses scope, design, conformance with design standards |
| Project Management | Schneller, Andrew | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Simonds, Jammie | Endorses Cost Estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|------------|---------------------------------|
| Finance | Easterly Patricia/Helm, Richard |
| Regulatory | Zschokke, Peter |

USSC Closure Paper



| | |
|----------------------------|------------------------------------|
| Jurisdictional Delegate(s) | Patterson Jim/ Terron Hill |
| Procurement | Curran, Art |
| Control Centers (CC) | Gallagher Michael Houston, Will |

USSC Closure Paper



7 Decisions

The US Sanctioning Committee (USSC) approved this paper at a USSC meeting held on January 11, 2017.

Signature..........Date..........

Christopher Kelly

Acting Senior Vice President Electric Process and Engineering

C036093

Elmwood#7Replace 23KV Groun Bank

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Fund Project Number: <u>C036093</u> | USSC #: |
| Revision: <u>2</u> | Budget Version: <u>PPM Project Authorizations</u> |
| Project Title: <u>Elmwood#7Replace 23KV Groun Bank</u> | |
| Project Description: This project will replace the existing 3, single-phase 500 kVA grounding bank rated 21.45 kV - 11 kV with a 3-phase zig-zag transformer rated 1500 kVA. | |

| | |
|---------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>PHILLIPS, MARK</u> | Initiator: <u>Pericola, Steven J</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>39</u> | Project Complexity Score: <u>15</u> |

Project Schedule / Expenditures

| | | | | | | | | | | | |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|--------------|----------------|------------------|------------|-----------------|------------------|------------|
| Revision Status: <u>Approved</u> | | | | | | | | | | | |
| Est Start Date: <u>4/9/2010</u> | Est Complete Date: <u>4/9/2014</u> | | | | | | | | | | |
| Est In-Service Date: <u>4/9/2014</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$511,534</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <td style="width: 20%;"><u>Capital</u></td> <td style="width: 20%;"><u>Expense</u></td> <td style="width: 20%;"><u>Removal</u></td> <td style="width: 20%;"><u>Total</u></td> <td style="width: 20%;"><u>Credits</u></td> </tr> <tr> <td><u>\$529,933</u></td> <td><u>\$0</u></td> <td><u>\$10,481</u></td> <td><u>\$540,414</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$529,933</u> | <u>\$0</u> | <u>\$10,481</u> | <u>\$540,414</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$529,933</u> | <u>\$0</u> | <u>\$10,481</u> | <u>\$540,414</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

The transformer grounding bank at Elmwood station is necessary for this station to operate. The transformers are in very poor condition and are near end-of-life. The units are old (81 years), and contain sludge in the oil. They are leaking oil and the foundations are contaminated with oil. Presently, there is not a contingency available in case of failure. This is part of a larger strategy and this bank is on our replacement and watch lists.

Project Scope:

The scope of this project is to replace the existing 21.45 kV - 11 kV, 3 single-phase 500 kVA grounding bank with a 1500 kVA, 3-phase zig-zag transformer. The existing concrete slab foundation will be removed and a new concrete slab foundation will be installed.

Project Alternatives Considered:

Additional Notes:

Complexity Score = 15, Level 3 (light playbook)

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|----------------|-------------|----------------------------|-----------------|----------------|-----------------------------|
| Line 1: | Date | <u>10/31/2012 00:00:00</u> | Approver | <u>pwrconv</u> | <u>SAP Default Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 348 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C036093 Current Total Authorized Amount: \$540,...

Title

Project Number

Budget Version PPM Project Authorizations (a)

Revision

Revision Status

Revision No.

Est Start Date

Est Complete Date

Est In Srvc Date

Capital

Expense

Jobbing

Retirement

Removal

Total (excl. Rets.)

Credits

Net

Spending Estimates:

Property Estimates:

Edit:

Other:

Revision Info **Other Updates**

Revision of 3

Distribution Project Detail (Form) / **09310 Elmwood#7 Replace 23KV Groun Bank** (Item)

Form Report, printed by: Diconza, Glen, Oct 02, 2017

| PROJECT DETAIL | | |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| 1 | Basic Info | |
| Project Name: | 09310 Elmwood#7 Replace 23KV Groun Bank | |
| Home Portfolio: | Company 49 Narragansett Electric - Substation (home) | |
| Created On: | Aug 10, 2010 | |
| ----- | | |
| Project ID: | 009310 | |
| Funding Project #: | C36093 | |
| Project Initiator: | | |
| Project Owner: | Parenteau, Stephen | |
| Project Description: | This project will replace the existing 3, single-phase 500 kVA grounding bank rated 21.45 kV - 11 kV with a 3-phase zig-zag transformer rated 1500 kVA. | |
| Type of Spend: | DxD | |
| Project Status: | Open Funded (1, 2a, 2b) | |
| Operating Segment: | Distribution | |
| Project Type: | P_Electric Distribution Substation | |
| Funding Type: | Specific | |
| CAPEX Program Name: | D_REP-Substation Transformer Replacement | |
| Budget Class: | Asset Replacement | |
| Executive Report: | Asset Replacement | |
| Economic: | Non Mandatory | |
| Spending Rationale: | Asset Condition | |
| Load/Non-Load: | Non Load | |
| Planning Classification: | Infrastructure Improvements | |
| Program: | Substation Asset Replacement | |
| Construction Type: | Substation | |
| Company #: | 49 | |
| Region: | NE | |
| Resource Planning Region: | Rhode Island | |
| Division: | OS000-00049 Ocean State | |
| State: | RI | |
| 2 | Sanctions | |
| DCIG #: | | |
| DCIG Status: | Not Required | |
| PWS Date: | | |
| DCIG Sanctioning Date: | | |
| DCIG Resanctioning Date: | | |
| DCIG Completion Date: | | |
| DCIG Closure Date: | | |
| Planning Study Number: | | |
| CAPEX Category: | | |
| Strategy Name: | Substation Power Transformer Strategy | |

Primavera ProSight Report - National Grid

Page 2 of 36

| | | |
|-----------------------------------|--------------|---|
| DOA Status: | Approved | ★ |
| Most Recent Approval Date: | Jan 23, 2012 | |
| Approved Capital Cost: | 529,933 | |
| Approved O&M Cost: | 0 | |
| Approved Removal Cost: | 10,481 | |
| Total Approved Cost: | 540,414 | |
| | | |
| | | |

| | | |
|----------------------------------|----------------------|---|
| 3 | Scores | |
| Project Risk Type: | Reliability | |
| Project Risk Criteria: | CMI per Event | |
| Mandatory? | No | |
| Impact Score: | 5 - (1M < X <= 5M) | |
| Likelihood Score: | 5 - Once in 3-5 Yrs | |
| Project Risk Score: | 39 | ◆ |
| ----- | | |
| Complexity Level: | Low - Light Playbook | |
| Project Complexity Score: | 15 | |
| | | |

| | | |
|-----------------------------------------|-------------------------------------------------------|--|
| 4 | PDS Required | |
| | <i>Is there an associated parent funding project?</i> | |
| Parent Funding Project? | No | |
| Blanket/Program Funding #: | | |
| ----- | | |
| Legacy PDS Number: | | |
| Planning Need Date: | Apr 09, 2014 | |
| Planning Year Type: | | |
| Planning Year: | | |
| Planned Start Year: | FY12/13 | |
| Major Location: | SUB #7 ELMWOOD OUTDOOR #2 | |
| City / Town: | | |
| Estimate Grade: | | |
| Escalated Estimate - Total Cost: | 540,414 | |
| Estimate Option #: | | |
| Emergent Form: | | |
| EDIS Requirements: | | |
| NAP Comment: | | |
| Study Area: | | |

| | | |
|----------------------------------------------|---------------------|--|
| 5 | Substation | |
| Substation Name: | Elmwood 7 - Outdoor | |
| Substation Number: | 7 | |
| Substation Voltage: | | |
| # of Dist Feeder Positions Added: | | |
| # of Added Capacity Feeder Positions: | | |

| | | |
|------------------------------------------|--------------|---|
| 6 Technical Approval | | |
| Technical Status: | Approved | |
| Submit for Technical Review? | Yes | |
| Technical Approver: | Domino, Mark | |
| ----- | | |
| Technical Approval? | Is Approved | |
| Reviewed By: | Domino, Mark | |
| Reviewed On: | Jan 13, 2012 | |
| ----- | | |
| Suggested Update Date: | Apr 09, 2011 | |
| Confirmed Estimate Maturity Date: | | — |
| Approver Comment: | | |

| | |
|----------------------------------------|------------------------|
| 7 Distribution Planning Release | |
| Status: | Released |
| Initially Released On: | Jan 24, 2012 |
| Last Released On: | Jan 24, 2012 |
| ----- | |
| Release Project? | |
| Comments: | |
| Design Manager/Supervisor: | Minisandram, Venkatesh |
| Program Manager: | Parenteau, Steve |

| | |
|-------------------------------|-------------------------------------------------------------------------------------------------------|
| 8 Project Cancellation | |
| | ** USE CAUTION ** Once a project is cancelled it can only be re-opened by a PPM Administrator. |
| Project Status: | Open Funded (1, 2a, 2b) |
| Project Cancellation: | |
| | |

| |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9 Justification and Scope |
| <i>Project Justification/Risk Identification</i> |
| The transformer grounding bank at Elmwood station is necessary for this station to operate. The transformers are in very poor condition and are near end-of-life. The units are old (81 years), and contain sludge in the oil. They are leaking oil and the foundations are contaminated with oil. Presently, there is not a contingency available in case of failure. This is part of a larger strategy and this bank is on our replacement and watch lists. |
| <i>Scope</i> |
| The scope of this project is to replace the existing 21.45 kV - 11 kV, 3 single-phase 500 kVA grounding bank with a 1500 kVA, 3-phase zig-zag transformer. The existing concrete slab foundation will be removed and a new concrete slab foundation will be installed. |
| <i>Project Alternatives Considered</i> |
| |
| <i>Additional Notes</i> |
| Complexity Score = 15, Level 3 (light playbook) |

| 10 Capital Budget | | | | |
|-------------------|-----------|--------|---------|-----------|
| | Capital | Opex | Removal | Total |
| FY 13 | 50,000 | 1,500 | 4,000 | 55,500 |
| FY 14 | 1,500,000 | 45,000 | 120,000 | 1,665,000 |
| FY 15 | 800,000 | 24,000 | 64,000 | 888,000 |
| FY 16 | 0 | 0 | 0 | 0 |
| FY 17 | 0 | 0 | 0 | 0 |

11

Project Documentation

Documentum Link:

| Name | Link | Size | Owner | Uploaded |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------|----------------|----------------------|
| Grd_Trans_Spec.pdf | http://nyhcbapp204v/ProSight/IDR/qd.aspx?docId=2573 | 81 KB | Duarte, Eileen | Jan 12, 2012 1:46 PM |
| h32365.pdf | http://nyhcbapp204v/ProSight/IDR/qd.aspx?docId=2574 | 238 KB | Duarte, Eileen | Jan 12, 2012 1:46 PM |
| online.pdf | http://nyhcbapp204v/ProSight/IDR/qd.aspx?docId=2546 | 44 KB | Duarte, Eileen | Jan 09, 2012 4:21 PM |
| RE 09 00 100 Conceptual Engineering Report for Elmwood Substations _update_conceptual.pdf | http://nyhcbapp204v/ProSight/IDR/qd.aspx?docId=2545 | 1,801 KB | Duarte, Eileen | Jan 09, 2012 4:14 PM |
| | Description: Conceptual Report | | | |

C036230

Langworthy Substation (D-Sub)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C036230</u> | USSC #: <u>USSC-12-444 v3C</u> |
| Revision: <u>8</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Langworthy Substation (D-Sub)</u> | |
| Project Description: This project upgrades Langworthy substation to add capacity and to phase this station with the rest of the distribution system in the area. | |

| | |
|---------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>ARTHUR, DAVID</u> | Initiator: <u>Vaz, Jack P</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>34</u> | Project Complexity Score: <u>19</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|----------------|--------------|----------------|--------------------|-----------------|----------------|--------------------|------------|
| Est Start Date: <u>4/1/2010</u> | Est Complete Date: <u>9/30/2014</u> | | | | | | | | | | |
| Est In-Service Date: <u>4/30/2014</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$1,702,060</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$1,682,000</u></td> <td><u>\$15,000</u></td> <td><u>\$6,000</u></td> <td><u>\$1,703,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$1,682,000</u> | <u>\$15,000</u> | <u>\$6,000</u> | <u>\$1,703,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$1,682,000</u> | <u>\$15,000</u> | <u>\$6,000</u> | <u>\$1,703,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

Westerly substation in Westerly, Rhode Island was damaged beyond repair in the recent Rhode Island floods (April 2010). Westerly Substation supplied about 30MW of load. This project adds much needed capacity in this area.

Project Scope:

Install a MITS at Langworthy Substation consisting of 1-7.5/9.375MVA transformer; 600A reclosers and 3-656A voltage regulators.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

BUDget Class updated to AR from D/F to match ISR 02/07/2012

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>8/23/2016 12:51:47</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C036230 Current Total Authorized Amount: \$1,70,...

Title Langworthy Substation (D-Sub)

Project Number C036230

Budget Version Default (active)

Revision Closure

Revision Status Approved

Revision No. 8

Est Start Date 04/01/2010

Est Complete Date 09/30/2014

Est In Svc Date 04/30/2014

Capital \$1,682,000.00

Expense \$15,000.00

Jobbing \$0.00

Retirement \$0.00

Removal \$6,000.00

Total (excl. Rets.) \$1,703,000.00

Credits \$0.00

Net \$1,703,000.00

Revision Info Other Updates

Revision 8 of 8 < > >|

[Find Revision](#) Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from W/O

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Version Compare Close

Record 1 of 1 < > >|

Audits



USSC Closure Paper

| | | | |
|---------------------------|-------------------------------|--------------------------|------------------------------------------------------------|
| Title: | Langworthy Substation Upgrade | Sanction Paper #: | USSC-12-444v3C |
| Project #: | C036230, C036232 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 8/9/16 |
| Author: | David Arthur | Sponsor: | Carol Sedewitz, - Vice President Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | David Arthur |

1 Executive Summary

This paper is presented to close C036230 and C036232. The total spend was \$1.888M. The latest sanctioned amount for this project was \$1.805M with a tolerance of +/- 10%.

The final spend amount is \$1.894M broken down into:

*\$1.854M Capex
\$0.021M Opex
\$0.019M Removal*

2 Project Summary

The project was a component of the Westerly Substation Flood Restoration Project and was originally initiated through a Partial Sanction dated Oct. 12, 2011 and titled "Westerly Substation Flood Restoration" in sanction paper number USSC1011PS407.

The upgrades at Langworthy Substation provide capacity to supply the southern section of Westerly. In addition, this upgrade corrected voltage phasing on this station to improve reliability by resolving undesirable voltage phasing issues. That is, feeder ties were originally made by first dropping the customer, then by switching them over to a second supply.

The driver for this project was Load Relief. Project was required to resolve projected overloads in the southern section of the Town of Westerly. The previous distribution system in this area did not have capacity to insure it operated safely within rated capability. Relief to this system was possible only by increasing distribution capacity. The most economical approach was to upgrade Langworthy substation. The project was executed successfully and completed the following:



USSC Closure Paper

- Upgraded the existing 34.5/12.47kV modular feeder position. A new power transformer, substation reclosers and voltage regulators were installed in a modular configuration and the existing equipment was removed.
- Installed a new feeder getaway and 600 ft of overhead reconductoring

3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|--------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C036230 | Langworthy Substation (D-Sub) | Capex | 1.682 |
| | | Opex | 0.015 |
| | | Removal | 0.006 |
| | | Total | 1.703 |
| Project # | Description | | Total Spend |
| C036232 | Langworthy Substation (D-Line) | Capex | 0.172 |
| | | Opex | 0.007 |
| | | Removal | 0.013 |
| | | Total | 0.192 |
| | | | |
| Total | | Capex | 1.854 |
| | | Opex | 0.022 |
| | | Removal | 0.019 |
| | | Total | 1.895 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 1.697 |
| | | Opex | 0.018 |
| | | Removal | 0.090 |
| | | Total Cost | 1.805 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.157) |
| | | Opex | (0.004) |
| | | Removal | 0.071 |
| | | Total Variance | (0.090) |

3.2 Analysis

**USSC Closure Paper**

The project was completed within the allowed budget. Additional landscaping mitigation at the station was required as a result of neighborhood outreach. This increased the cost of the overall project, however the final cost is within the estimate tolerance.

4 Improvements / Lessons Learned

Ensure that project risk or estimate includes costs for landscaping improvements and EMF analysis if the station is located within a residential area.

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|----------------------|---------------------------------------------------------------------------------------------|
| <i>Investment Planning</i> | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| <i>Resource Planning</i> | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Resource Planning | Mark Phillips | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Alan T. Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Suzan E. Martuscello | Endorses scope, design, conformance with design standards |
| Engineering and Design | Leonard G. Swanson | Endorses scope, design, conformance with design standards |
| Project Management | Andrew Schneller | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Jammie Simonds | Endorses Cost Estimate |

USSC Closure Paper



6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.



| Function | Individual |
|-------------------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature..........Date..........
Christopher Kelly, Senior Vice President, Electric Process & Engineering

C036397

Clarkson - new 13F10 feeder (line)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C036397</u> | USSC #: <u>USSC-16-215C</u> |
| Revision: <u>8</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Clarkson - new 13F10 feeder (line)</u> | |
| Project Description: New 13F10 feeder. Install new UG getaway from Sub to P12 Whipple St (1500' in existing MH&D). Close new circuit recloser. Open P6 Admiral St. Close P45 Orme St (previously 13F3). Open P52 Smith St (previously 13F2). | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Evans, David W</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>31</u> | Project Complexity Score: <u>15</u> |

Project Schedule / Expenditures

| | |
|---------------------------------------------|-------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>1/1/2012</u> | Est Complete Date: <u>9/1/2015</u> |
| Est In-Service Date: <u>9/1/2015</u> | |
| TTD Actuals: <u>\$1,008,150</u> | As Of: <u>10/2/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$950,000</u> | <u>\$19,000</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$40,000</u> | <u>\$1,009,000</u> |
| | <u>Credits</u> |
| | <u>\$0</u> |

Justification / Risk Identification:

13F2, 13F3, 13F4 & 13F8 feeders projected to exceed their SN ratings in 2013.

Project Scope:

New 13F10 feeder. Install new UG getaway from Sub to P12 Whipple St (1500' in existing MH&D). Close new circuit recloser. Open P6 Admiral St. Close P45 Orme St (previously 13F3). Open P52 Smith St (previously 13F2)

04/25/12-- THIS 13F10 FEEDER GETAWAY IS ON THE CORNER OF SALINA AND SUFFOLK ST.
A NEW PLAN TO BE DEVELOPED TO GET 13F10 OUT ON THE DISTRIBUTION CIRCUIT FOR LOAD RELIEF IN THE AREA FROM ITS CURRENT RINGING LOCATION

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Re-Sanction from \$630K to \$960K document attached. Additional work was added to the overall scope. Please see above for Phase 2 details. Based on the final design it was determined that Phase 2 would cost 330K including construction. The following is a break down of costs, 260K for Labor and Labor Overheads including Engineering & Design, 50K for Materials and Material Overheads, 10K for Transportation and 10K for Police Protection for a total of 330K for Phase 2. Phase 1 was previously approved for 630K bringing the total project cost to 960K.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>6/22/2016 16:54:16</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C036397 Current Total Authorized Amount: \$1,00...

Title Clarkson - new 13F10 feeder (line)

Project Number C036397

Budget Version Default (active)

Revision 16-215C

Revision Status Approved

Revision No. 8

Est Start Date 01/01/2012

Est Complete Date 09/01/2015

Est In Srvc Date 09/01/2015

Capital \$950,000.00

Expense \$19,000.00

Jobbing \$0.00

Retirement \$0.00

Removal \$40,000.00

Total (excl. Rets.) \$1,009,000.00

Credits \$0.00

Net \$1,009,000.00

Revision Info Other Updates

Revision 8 of 8

Find Revision

Send for Approval

Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record 1 of 1

Audits

USSC Closure Paper



| | | | |
|---------------------------|------------------------------------|--------------------------|-----------------------------------------------------|
| Title: | Clarkson - New 13F10 feeder (line) | Sanction Paper #: | USSC-16-215C |
| Project #: | C036397 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 06/14/2016 |
| Author: | Joe Curley | Sponsor: | Carol Sedewitz, Acting VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Joe Curley |

1 Executive Summary

This paper is presented to close C036397. The total spend was \$1.009M. The latest sanctioned amount for this project was \$0.960M.

The final spend amount is \$1.009M broken down into:

\$0.950M Capex
\$0.019M Opex
\$0.040M Removal

2 Project Summary

As a result of 2012 annual planning analysis, the 13F10 feeder project was initiated to address normal summer issues on the Clarkson Street 13F2 and 13F3 feeders. Since this projects inception, load transfers have been enacted to avoid overloads and Distribution Planning has confirmed the continued need and priority. The scope included the installation of a new underground getaway cable from the substation to Pole 12 Whipple Street (1400' in an existing manhole & duct system and 100' in a new 2 way - 5" duct-bank).

USSC Closure Paper



3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C036397 | Clarkson - New 13F10 Feeder (Line) | Capex | 0.950 |
| | | Opex | 0.019 |
| | | Removal | 0.040 |
| | | Total | 1.009 |
| | | | |
| Total | | Capex | 0.950 |
| | | Opex | 0.019 |
| | | Removal | 0.040 |
| | | Total | 1.009 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 0.653 |
| | | Opex | 0.173 |
| | | Removal | 0.134 |
| | | Total Cost | 0.960 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.297) |
| | | Opex | 0.133 |
| | | Removal | 0.115 |
| | | Total Variance | (0.049) |

3.2 Analysis

4 Improvements / Lessons Learned

A 2nd phase of this project was added after Operations became involved during the Constructability Review with Distribution Design. Planning/Design should have included Operations in their original discussions to determine scope. Instead of adding a 2nd phase of the project during the constructability review, the entire project scope could have been determined prior to this job starting detailed design.

USSC Closure Paper



5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|---------------------------|--------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management/Planning | Alan Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |



USSC Closure Paper

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|-------------------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |
| Procurement | Art Curran |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature.....*CK*.....Date.....*6/22/16*.....

Executive Sponsor – Christopher Kelly,
Acting Senior Vice President – Electric Process & Engineering

C036450

83F2 Load Relief - New Fdr (Dline)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C036450</u> | USSC #: - |
| Revision: <u>6</u> | Budget Version: <u>Default</u> |
| Project Title: <u>83F2 Load Relief - New Fdr (Dline)</u> | |
| Project Description: Distribution line work associated with the installation of a new 12.47 kV feeder at Tower Hill Rd Substation (88F7) | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Shields, Ryan</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>41</u> | Project Complexity Score: <u>11</u> |

Project Schedule / Expenditures

| | | | | | |
|----------------------------------------------|-----------------------|-----------------------|--------------------------------------------|---------------------|-----------------------|
| Revision Status: <u>Approved</u> | | | | | |
| Est Start Date: <u>4/1/2013</u> | | | Est Complete Date: <u>9/15/2015</u> | | |
| Est In-Service Date: <u>9/15/2015</u> | | | | | |
| TTD Actuals: <u>\$690,054</u> | | | As Of: <u>10/2/2017</u> | | |
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$258,400</u> | <u>\$394,400</u> | <u>\$27,200</u> | <u>\$680,000</u> | <u>\$0</u> |

Justification / Risk Identification:

In 2014, projected loading on two feeders in the Tower Hill Road substation area will exceed feeder summer normal (SN) ratings. Loading on the Tower Hill 88F5 feeder is projected at 113% of SN rating and loading on the Old Baptist 46F2 feeder is projected at 104% of SN rating.

Tower Hill Road substation was constructed to supply load growth in the South County East Study Area. Tower Hill substation consists of a single transformer supplying four feeders. To date, only three feeders have been

Project Scope:

From the Tower Hill substation 88F7 breaker position to P91 Tower Hill Rd (~1,800') install getaway cable consisting of 3-1/C 1000 Kcmil CU EPR CN 15kV cable.

Re-route the Lafayette substation 30F1 & 30F2 feeders. The 30F1 will be routed east and the 30F2 west. On Ten Rod Rd, underbuild existing open wire construction with 477 Al spacer cable to reroute the 30F2 feeder west.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Re-Sanction from \$494,956 to \$680K document attached. Police Protection was understated on the original estimate by 30K as well as Transportation by 20k. In addition, there were multiple outages that were required to be done on off hours and overtime work was authorized in order to complete this project which caused an increase in Labor and Labor Overheads by 135K bringing the total project cost to 680K.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|-------------|---------------------------|-----------------|-------------------------|-------------------------------|
| Line 1: | Date | <u>9/3/2015 11:16:38</u> | Approver | <u>curljo</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date | <u>9/4/2015 11:54:39</u> | Approver | <u>Park, Michelle L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date | <u>9/17/2015 09:25:37</u> | Approver | <u>Constable, Ryan</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date | <u>9/25/2015 08:21:38</u> | Approver | <u>Cox, Roger D</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date | <u>9/29/2015 09:18:16</u> | Approver | <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C036450 Current Total Authorized Amount: \$680,000.00

Title: 83F2 Load Relief - New Fdr (Dline)

Project Number: C036450

Budget Version Default (active)

Revision: RSN Form

Revision Status: Approved

Revision No.: 6

Est Start Date: 04/01/2013

Est Complete Date: 09/15/2015

Est In Srvc Date: 09/15/2015

Capital: \$258,400.00

Expense: \$394,400.00

Jobbing: \$0.00

Retirement: \$0.00

Removal: \$27,200.00

Total (excl. Rets.): \$680,000.00

Credits: \$0.00

Net: \$680,000.00

Revision Info: Other Updates

Revision: 6 of 6

Find Revision

Send for Approval

Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from W/O

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Version Compare

Close

Record: 1 of 1

Audits

Change in DOA Request Form **(Less than Million)**

Version 9.0

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Electric - Janice Flynn

| | |
|-------------------------|------------------------------------|
| *Date: | 8/31/2015 |
| *Operating Company: | The Narragansett Electric Co. |
| *PowerPlant Project Id: | C036450 |
| *Project Name: | 83F2 Load Relief - New Fdr (Dline) |
| *Project Engineer: | Chris Montalto |
| *Project Manager: | Joe Curley |

Latest Project Estimate

| | |
|---------------------------|------------|
| *Date of Latest Sanction: | 10/31/2012 |
|---------------------------|------------|

| Total | Capex | Opex | Removal |
|-----------|-----------|-----------|----------|
| \$494,956 | \$188,083 | \$287,075 | \$19,798 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|-----------|----------|
| \$680,000 | \$258,400 | \$394,400 | \$27,200 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-----------|-----------|----------|
| \$530,000 | \$201,400 | \$307,400 | \$21,200 |

| Current FY | Capex | Opex | Removal |
|------------|----------|----------|---------|
| \$150,000 | \$57,000 | \$87,000 | \$6,000 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| |
|--|
| |
|--|

Reason for Revision

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process |
| | New Project Estimated Completion Date: 9/15/2015 |

| | |
|--------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|--------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending **(Please expand the row height if box doesn't fit)**

| | |
|--------------------------|--------------------------------------------|
| <input type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|--------------------------|--------------------------------------------|

Change in DOA Request Form (Less than Million)

| | |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| <input type="checkbox"/> | Resource Allocation (Schedule, Delay, OT, or Contractor) |
| <input checked="" type="checkbox"/> | Low/High Estimate Police Protection was understated on the original estimate by 30K as well as Transportation by 20k. In addition, there were multiple outages that were required to be done on off hours and overtime work was authorized in order to complete this project which caused an increase in Labor and Labor Overheads by 135K bringing the total project cost to 680K. |
| <input type="checkbox"/> | External Forces (Permitting Requirements, Weather, Contractor Issues, etc) |

In-service Dates

*Original In-service Date: 6/1/2021
 *Revised In-service Date: 9/15/2015

C036516

Kilvert St 87 - New Fdr (DLine)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C036516</u> | USSC #: <u>USSC-12-346 v2</u> |
| Revision: <u>6</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Kilvert St 87 - New Fdr (DLine)</u> | |
| Project Description: Distribution line work associated with installing two new 12.47 kV feeder at Kilvert Street substation. | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>HURLEY, KATHLEEN</u> | Initiator: <u>Shields, Ryan</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>42</u> | Project Complexity Score: <u>20</u> |

Project Schedule / Expenditures

| | |
|----------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>8/10/2012</u> | Est Complete Date: <u>5/10/2022</u> |
| Est In-Service Date: <u>6/30/2015</u> | |
| TTD Actuals: <u>\$3,732,153</u> | As Of: <u>10/2/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$3,143,000</u> | <u>\$165,000</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$523,000</u> | <u>\$3,831,000</u> |
| <u>Credits</u> | <u>\$0</u> |

Justification / Risk Identification:

This project is required to address reliability concerns in the City of Warwick. The concerns to be addressed are as follows:

- 1) In 2015, one feeder is projected to be loaded to 115% of its Summer Normal (SN) rating. In 2020, six feeders are projected to be loaded in excess of their SN rating.
- 2) In 2015, loading on the Warwick T1 transformer is projected at 112% of SN rating. In 2017, loading on the Warwick T4 transformer is projected at 104% of SN rating.

Project Scope:

At Kilvert Street substation, install the 87F5 and 87F6 feeder positions. Install UG and OH infrastructure as shown in the attached scope document. Modify the area distribution also as shown on the attached scope document.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>8/15/2013 11:13:31</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C036516 Current Total Authorized Amount: \$3,831,000.00

Title **Kilvert St 87 - New Fdr (DLine)**

Project Number **C036516**

Budget Version Default [active]

Revision **v2**

Revision Status **Approved**

Revision No. **6**

Est Start Date **08/10/2012**

Est Complete Date **05/10/2022**

Est In Srvc Date **06/30/2015**

Capital **\$3,143,000.00**

Expense **\$165,000.00**

Jobbing **\$0.00**

Retirement **\$0.00**

Removal **\$523,000.00**

Total (excl. Rets.) **\$3,831,000.00**

Credits **\$0.00**

Net **\$3,831,000.00**

Revision Info **Other Updates**

Revision **6** of **6** **< >**

Find Revision **Send for Approval**

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record **1** of **1** **< >**

Audits



Short Form Sanction Paper

| | | | |
|---------------------------|-------------------------------|--------------------------|-----------------|
| Title: | Kilvert St - New Feeders | Sanction Paper #: | USSC-12-346 v2 |
| Project #: | C036516 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | August 6, 2013 |
| Author: | Kathleen Hurley | Sponsor: | Cheryl Warren |
| Utility Service: | Electricity T&D | Project Manager: | Kathleen Hurley |

1 Executive Summary

1.1 Sanctioning Summary

This paper requests a Sanction for C036516 in the amount of \$3.83M with a tolerance of +/- 10% for the purposes of a full implementation of the Kilvert St Feeder Project.

The sanction amount is \$3.83M broken down into:

- \$ 3.140 Capex
- \$ 0.170 Opex
- \$ 0.520 Removal

2 Project Detail

2.1 Project Description, Justification, Customer Issues

This project is required to address reliability concerns in the City of Warwick. The concerns to be addressed are as follows:

- By 2016, three feeders are projected to be loaded greater than their Summer Normal (SN) ratings.
- By 2015 and 2017 respectively, the loading on the Warwick T1 and T4 transformers is projected to be greater than their SN ratings.
- By 2020 and 2022 respectively, the loading on the 2222 and 2262 sub-transmission lines is projected to be at or greater than their SN ratings.
- Contingency loading on a number of sub-transmission lines exceeds summer emergency ratings. Block transfers are utilized to prevent line overloads. These block transfers have a negative impact on reliability and make operating this system costly and challenging since block transfers have to be made manually due to lack of remote control capabilities.

Short Form Sanction Paper



To address the projected overloads considering the number of geographic barriers in this area, this paper recommends installing two new feeders, 87F5 and 87F6, at Kilvert Street substation. This recommendation is in-line with the long-term plan for this area to continue to expand Kilvert Street to provide area relief. The plan resolves projected overloads in the area at the least cost. There is an approved strategy to install a second 55-MVA transformer at Kilvert Street to mitigate contingency concerns (USSC-12-080).

Loading on a number of feeders in this area is projected to exceed summer normal ratings within the next five years. Load transfers have been used in the past to defer the need for infrastructure investment, but further transfers are no longer possible. New capacity is required to address these projected overloads. The table below shows loading on area feeders projected to be loaded above summer normal ratings:

| Substation | Feeder | SN Rating (Amps) | 2016 | | 2019 | | 2022 | |
|--------------|--------|------------------|------|------|------|------|------|------|
| | | | Amps | %SN | Amps | %SN | Amps | %SN |
| DRUMROCK | 14F1 | 530 | 519 | 98% | 551 | 104% | 582 | 110% |
| DRUMROCK | 14F2 | 530 | 490 | 92% | 520 | 98% | 550 | 104% |
| LINCOLN AVE. | 72F4 | 530 | 535 | 101% | 568 | 107% | 600 | 113% |
| LINCOLN AVE. | 72F5 | 515 | 518 | 101% | 550 | 107% | 582 | 113% |
| LINCOLN AVE. | 72F6 | 515 | 521 | 101% | 553 | 107% | 585 | 114% |
| WARWICK | 52F1 | 409 | 368 | 90% | 391 | 96% | 413 | 101% |

2.1.1 Alternatives:

Alternative 1 (\$10M):

This plan recommends development of a new 115/12.47 kV substation adjacent to the transmission right-of-way on a new site near the intersection of East Avenue and Greenwich Avenue in the city of Warwick. This substation would be supplied from the adjacent 115kV transmission lines. Initially, the substation would be equipped with a single 24/32/40 MVA transformer and two feeders. Land would have to be acquired to site this proposed substation avoiding to the furthest extent possible wetlands along the Pawtuxet River. The Investment Grade Estimate of this plan is \$10M. Much of the distribution line additions associated with the recommended option would be required under this plan. This alternative is not recommended because of the higher cost, the need to find a suitable parcel of land, and the potential permitting and environmental challenges associated with building on a new site.

Alternative 2 (\$16M):

This plan would require significant substation and sub-transmission work. Substation work would include the installation of a new modular feeder at Warwick



Short Form Sanction Paper

substation, the upgrade of the three existing Warwick substation feeders, and the addition of EMS to the station. Sub-transmission improvements would include the upgrade of the sub-transmission system between Drumrock and Warwick substations. Specific work would include upgrading approximately 12-miles of limiting conductors to 795 ACSR along congested residential city streets. The Investment Grade Estimate for this plan is \$16M. This plan is not recommended because of the comparatively higher cost to the recommended plan.

Alternative 3 (\$0M):

This deferral plan does not address the projected normal and contingency overloads and exposes the Company to increasing load supply and customer outage risks.

2.2 Investment Recovery

Investment recovery will be through standard rate recovery mechanisms.

2.2.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.540 million. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects:

| Project Number | Project Type (Elec only) | Project Title | Estimate Amount (\$M) |
|----------------|-----------------------------|--------------------|--------------------------|
| C036516 | D-Line | Kilvert St Feeders | \$ 3.831 |
| Total | | | \$ 3.831 |

3.2 Associated Projects:

| Project Number | Project Title | Estimate Amount (\$M) |
|----------------|------------------------------------------------|--------------------------|
| C036522 | Kilvert Street #87 Substation Second Transform | \$1.934M |

3.3 Prior Sanctioning History (including relevant approved Strategies):

| Date | Governance Body | Sanctioned Amount | Paper Title | Sanction Type |
|-------------------|--------------------|----------------------|-------------------------------|------------------|
| August 8, 2012 | USSC-12-346 | \$0.300M | Kilvert Street New Feeders | Partial Sanction |
| | | | | |

3.4 Category:



Short Form Sanction Paper

| Category | Reference to Mandate, Policy, or NPV Assumptions |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV | National Grid, USA EO Internal Strategy Document Distribution Planning Criteria Strategy. |

Asset Management Risk Score: 42

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability
 ☐ Environment
 ☐ Health & Safety
 ☐ Not Policy Driven

3.5 Complexity Level:

☐ High Complexity
 ☒ Medium Complexity
 ☐ Low Complexity
 ☐ N/A

Complexity Score: 20

4 Financial

4.1 Business Plan:

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|----------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|
| FY14-FY18 NE Distribution Capital Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | \$(-.323M) |



Short Form Sanction Paper

4.1.1 If cost > approved Business Plan how will this be funded?

4.2 CIAC / Reimbursement

| \$M | Prior Yrs | Yr. 1 2013/14 | Yr. 2 2014/15 | Yr. 3 2015/16 | Yr. 4 2016/17 | Yr. 5 2017/18 | Yr. 6 + 2018/19 | Total |
|--------------------|-----------|------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| CIAC/Reimbursement | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |

4.3 Cost Summary Table

| Project Number | Project Title | Project Estimate | Spend | Prior Yrs | Yr. 1 2013/14 | Yr. 2 2014/15 | Yr. 3 2015/16 | Yr. 4 2016/17 | Yr. 5 2017/18 | Yr. 6 + 2018/19 | Total |
|----------------|--------------------|------------------|---------|-----------|------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| C036516 | Kilvert St Feeders | Est Lvl | CapEx | 0.017 | 1.736 | 1.390 | - | - | - | - | 3.143 |
| | | | OpEx | 0.001 | 0.097 | 0.067 | - | - | - | - | 0.165 |
| | | | Removal | 0.001 | 0.376 | 0.146 | - | - | - | - | 0.523 |
| | | | Total | 0.019 | 2.209 | 1.603 | - | - | - | - | 3.831 |

4.4 Project Budget Summary Table

| | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|----------|
| | | Yr. 1 2013/14 | Yr. 2 2014/15 | Yr. 3 2015/16 | Yr. 4 2016/17 | Yr. 5 2017/18 | Yr. 6 + 2018/19 | |
| CapEx | \$ - | \$ 0.300 | \$ 1.300 | \$ 1.350 | \$ - | \$ - | \$ - | \$ 2.950 |
| OpEx | \$ - | \$ 0.015 | \$ 0.065 | \$ 0.068 | \$ - | \$ - | \$ - | \$ 0.148 |
| Removal | \$ - | \$ 0.040 | \$ 0.182 | \$ 0.189 | \$ - | \$ - | \$ - | \$ 0.411 |
| Total Cost in Bus. Plan | \$ - | \$ 0.355 | \$ 1.547 | \$ 1.607 | \$ - | \$ - | \$ - | \$ 3.509 |

Variance (Business Plan-Project Estimate)

| | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|------------|
| | | Yr. 1 2013/14 | Yr. 2 2014/15 | Yr. 3 2015/16 | Yr. 4 2016/17 | Yr. 5 2017/18 | Yr. 6 + 2018/19 | |
| CapEx | \$ (0.017) | \$ (1.436) | \$ (0.090) | \$ 1.350 | \$ - | \$ - | \$ - | \$ (0.193) |
| OpEx | \$ (0.001) | \$ (0.082) | \$ (0.002) | \$ 0.068 | \$ - | \$ - | \$ - | \$ (0.018) |
| Removal | \$ (0.001) | \$ (0.336) | \$ 0.036 | \$ 0.189 | \$ - | \$ - | \$ - | \$ (0.112) |
| Total Cost in Bus. Plan | \$ (0.019) | \$ (1.854) | \$ (0.056) | \$ 1.607 | \$ - | \$ - | \$ - | \$ (0.323) |

5 Key Milestones:

| Milestone | Target Date: (Month/Year) |
|-------------------------------|------------------------------|
| Engineering & Design Complete | July, 2013 |
| Project Sanction | August, 2013 |
| Construction Start | September 2013 |
| Construction Finish | June, 2015 |
| Ready For Load | June, 2015 |



Short Form Sanction Paper

6 Statements of Support

6.1.1 Supporters

| Role | Name | Responsibilities |
|------------------------|---------------------|----------------------------------------------------------------------|
| Investment Planner | DiConza, Glen | Endorses relative to 5-year business plan or emergent work. |
| Resource Planning | Patterson, Jim | Endorses Resources, cost estimate, schedule, and Portfolio Alignment |
| Engineering and Design | Sheridan, Robert D. | Endorses scope, design, conformance with design standards |
| Project Management | Moore, Timothy | Endorses Resources, cost estimate, schedule |

6.1.2 Reviewers

Reviewers read the paper for content / language and recommends edits if necessary.

| Reviewer List | Name |
|--------------------------|-------------------|
| Finance | Keith Fowler |
| Regulatory | Gideon Katsh |
| Jurisdictional Delegates | Jennifer Grimsley |
| Procurement | Art Curran |
| Control Center (CC) | Michael Gallagher |

Short Form Sanction Paper



7. Decisions:

| | |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| I: | |
| (a) | APPROVE this paper and the investment of \$3.83MM and a tolerance of +/-10% |
| (b) | NOTE that Kathleen Hurley is the Project Manager and has the approved financial delegation. |
| Signature..... | Date..... 8/14/13 |
| Executive Sponsor – Marie Jordqn, Senior Vice President, Network Strategy | |

Short Form Sanction Paper



C036522

Kilvert St 87 - Install TB#2

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C036522</u> | USSC #: <u>USSC-12-080 v4</u> |
| Revision: <u>7</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Kilvert St 87 - Install TB#2</u> | |
| Project Description: This project recommends the installation of a second 1-33/44/55 MVA 115/12.47 kV power transformer (TB#2). | |

| | |
|---------------------------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>ARCHER, SEAN</u> | Initiator: <u>Shields, Ryan</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>39</u> | Project Complexity Score: <u>21</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------|--------------|----------------|--------------------|------------|-----------------|--------------------|------------|
| Est Start Date: <u>6/1/2011</u> | Est Complete Date: <u>3/31/2017</u> | | | | | | | | | | |
| Est In-Service Date: <u>9/1/2016</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$3,771,186</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$3,740,000</u></td> <td><u>\$0</u></td> <td><u>\$24,000</u></td> <td><u>\$3,764,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$3,740,000</u> | <u>\$0</u> | <u>\$24,000</u> | <u>\$3,764,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$3,740,000</u> | <u>\$0</u> | <u>\$24,000</u> | <u>\$3,764,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

Kilvert 87 TB#1 is a 1-33/44/55 MVA 115/12.47 kV transformer loaded to 25.2 MVA, or 38% of its summer normal rating (67 MVA) and 30% of its summer emergency rating (84 MVA), during the summer peak of 2010.

A failure of the existing Kilvert TB#1 will result in outages, yielding approximately 20.4 MVA of unserved load, or 490 MWh. Furthermore, a recommendation has been made within the 15-year planning horizon to install an additional transformer at Kilvert St substation.

Project Scope:

Distribution Substation (DxD) work associated with the installation of a second 1-33/44/55 MVA 115/12.47 kV power transformer.

This project recommends the installation of two bus-tie circuit breakers, a low-side air break switch, fuse to station service, and relaying/protection associated with the installation of a second 1-33/44/55 MVA 115/12.47 kV power transformer at Kilvert St substation.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Cost estimates are based on a template provided by Substation Engineering - "Generic Cost Estimates for Substation Work (February 2009)"

Partial Sanction \$300K over 3 projects Distribution PPM9312 Transmission C42083 C42084. Will allocate \$100K over 3 projects.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>12/2/2015 12:50:52</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C036522 Current Total Authorized Amount: \$3,76...

Title Kilvert St 87 - Install TB#2
Project Number C036522

Budget Version Default (active)
Revision v4
Revision Status Approved
Revision No. 7
Est Start Date 06/01/2011
Est Complete Date 03/31/2017
Est In Srvc Date 09/01/2016
Capital \$3,740,000.00
Expense \$0.00
Jobbing \$0.00
Retirement \$0.00
Removal \$24,000.00
Total (excl. Rets.) \$3,764,000.00
Credits \$0.00
Net \$3,764,000.00

Revision Info Other Updates

Revision 7 of 7
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare Close

Record 1 of 1
Audits

This document has been reviewed for Critical
Energy Infrastructure Information (CEII)

B+T



Short Form Sanction Paper

| | | | |
|-------------------------------|-----------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------|
| Title: | Kilvert Street #87 Substation Second Transformer & Two New Feeder Positions | Sanction Paper #: | USSC-12-080-v4 |
| Project #s: | C036522, C042083, & C042084 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | November 17, 2015 |
| Author: | Sean Archer / Andrew Schneller | Sponsor: | John Gavin Vice President – Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Sean Archer / Andrew Schneller |

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of Kilvert Street #87 Substation Second Transformer & Two New Feeder Positions Projects in the amount of \$5.364 M with a tolerance of +/- 10% for the purposes of complete project execution and closure.

This sanction amount is \$5.364 M broken down into:

| | |
|-----------|---------|
| \$5.320 M | Capex |
| \$0.006 M | Opex |
| \$0.038 M | Removal |

1.2 Project Summary

This project addresses load at risk at Kilvert Street substation; feeder loading in the area of the Drumrock, Lincoln Avenue, and Warwick substations; power transformer loading at the Warwick substation; and sub-transmission system normal/contingency loading issues on the Drumrock substation 23 kV 2222, 2262, and 2264 feeders by expanding the Kilvert Street substation.

The project adds a second 115 kV tap line, a second 115-12.47 kV power transformer, and two 12.47 kV feeders at the Kilvert Street substation. The project also upgrades the existing Kilvert Street substation 12.47 kV capacitor bank power cable and adds a second 12.47 kV capacitor bank.



Short Form Sanction Paper

2 Project Detail

2.1 Background

During the 2010 Annual Planning process, a review of the Kilvert Street # 89 substation was performed along with the surrounding area. For this review the most recent Distribution Planning Criteria Strategy was utilized. This review identified a significant amount of un-served distribution load for loss of the existing Kilvert Street substation transformer. To mitigate this risk, the review recommended the installation of the second Kilvert Street substation transformer. This Paper includes the substation and transmission line facilities necessary to install the second transformer.

Kilvert Street substation was built in 2004 and supplies distribution load in the cities of Cranston and Warwick, Rhode Island. The substation is a 115-12.47 kV low profile design with a single 33/44/55 MVA transformer supplying four feeders. Kilvert Street substation supplies approximately 3,250 customers with a peak load of approximately 29 MW.

Kilvert Street was built to relieve the area's highly utilized distribution system and to supply load growth occurring in and around T.F. Green Airport. The station was designed and permitted for two 33/44/55 MVA power transformers and eight distribution feeders. To date, a single 33/44/55 MVA transformer supplying four distribution feeders has been installed.

To address the load at risk at Kilvert Street substation, this paper recommends that a second 115/13.2 kV, 33/44/55 MVA power transformer be installed at this substation, a steel H-frame deadend switch structure and manual 115 kV switch be installed in the J-188 line in the transmission right-of-way, and a 115 kV transmission line tap be installed from the J-188 line to Kilvert Street substation. The installation of the second transmission line tap and power transformer, along with two 12.47 kV tie circuit breakers, would result in no un-served load exposure for loss of one of the two 115-12.47 kV Kilvert Street substation transformers.

To address reliability concerns in the City of Warwick, Rhode Island, this Paper recommends the installation of two 12.47 kV feeder positions that would serve as sources for two new feeders proposed in Funding Project C036516, currently in construction. This recommendation is also supported by the approved Partial Sanction Paper USSC-12-346.

2.2 Drivers

Load At Risk: The main driver for this project is load at risk in the cities of Cranston and Warwick, Rhode Island for loss of the single Kilvert Street substation transformer. An outage of the Kilvert Street substation transformer would result in the loss of 29 MW of load. Of this load, approximately 14 MW could be transferred to other area stations



Short Form Sanction Paper

through feeder ties leaving 15 MW of load un-served until a spare or mobile transformer would be installed at Kilvert Street. This would result in an exposure of 400MWH.

By 2016 peak load at Kilvert Street is projected at 32 MW. This load would result in approximately 23 MW of un-served load for loss of the single Kilvert Street substation transformer until a spare or mobile transformer would be installed. This would result in an exposure of 567 MWH.

Feeder Loading: Loading on three feeders in this area is projected to exceed summer normal ratings within the next five years. Load transfers have been used in the past to defer the need for infrastructure investment, but further transfers are no longer possible. New capacity is required to address projected feeder overloads.

Transformer Loading: In 2016, loading on the Warwick T1 transformer is projected at 113% of its Summer Normal (SN) rating. In 2017, loading on the Warwick T4 transformer is projected at 101% of its SN rating. Relief of these transformers is not possible without adding new capacity.

Sub-Transmission System (Normal Loading): In 2020, loading on the 2222 sub-transmission line is projected at 100% of Summer Normal (SN) rating. In 2023, loading on the 2262 sub-transmission line is projected at 100% of SN rating.

Sub-Transmission System (Contingency Loading): Contingency loading on four sub-transmission lines is projected to exceed summer emergency ratings within the next five years. Block transfers are utilized to prevent line overloads. These block transfers have a negative impact on reliability and make operating this system costly and challenging since block transfers have to be made manually due to lack of remote control capabilities.

2.3 Kilvert Street #89 Substation Project Description

Transmission Line

- Install one (1) 115 kV wood two-pole terminal deadend tap structure and tap line from the existing J-188 line to the substation.
- Install one (1) 115 kV 2000 A loadbreak switch and steel H-Frame deadend structure in the J-188 line to the north of the substation.
- Replace disc insulator strings and install restraining insulators on (1) 115 kV suspension structure.

Transmission Substation

- Install one (1) deadend structure for the 115 kV transmission line tap.
- Install one (1) 115 kV circuit switcher.



Short Form Sanction Paper

Distribution Substation

- Install the following equipment:
 - One (1) 115-12.47 kV power transformer
 - One (1) 12.47 kV transformer disconnect switch
 - Six (6) 12.47 kV circuit breakers
 - Two (2) 12.47 kV feeder positions
 - Six (6) 12.47 kV feeder voltage regulators with bypass switches
 - One 12.47 kV capacitor bank
 - Associated primary, secondary, communications, control, metering, and protective relay equipment.
- Replace existing underground power cable from 12.47 kV Bus #2 to Capacitor Bank #2.

2.4 Benefits

The recommended plan is in-line with the long-term plan for this area to continue the expansion of Kilvert Street substation to supply load growth in and around the T.F. Green Airport area and to relieve load on the area's highly utilized sub-transmission and distribution system. The plan resolves un-served load exposure and projected overloads in the area at the least cost.

2.5 Business & Customer Issues

The proposed project is in the approved capital plans. A Full Sanction Paper would be prepared and presented after completion of final engineering and design.

2.6 Alternatives

Alternative 1: Development of a New Substation (\$8.0 M)

Alternative 1 recommends development of a new 115-12.47 kV substation adjacent to the existing 115 kV transmission right-of-way on a new site near the intersection of East Avenue and Greenwich Avenue in the city of Warwick. This substation would be supplied from the adjacent 115kV transmission lines. Initially, the substation would be equipped with a single 24/32/40 MVA transformer and two feeders. Land would have to be acquired to site this proposed substation. The Investment Grade Estimate of this plan is \$8.0 M. This alternative is not recommended because of the higher cost, the need to obtain a suitable parcel of land, and the potential permitting challenges associated with building on a new site.



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Alternative 2: Development of a New Substation (\$8.2 M)

Alternative 2 recommends development of a new 23-12.47 kV modular substation with two feeders at Hillsgrove, a former 4.16kV substation site on Jefferson Boulevard in the city of Warwick just north of T. F. Green airport. This plan requires a major expenditure to reinforce the 23kV supply system to provide capacity to supply the proposed Hillsgrove substation. The Investment Grade Estimate of this plan is \$8.2M. This plan is not recommended because it offers no advantages over the Recommended Plan or Alternative 1.

Alternative 3: Do Nothing

This alternative would not address projected normal and contingency overloads and would expose the Company to increasing load supply and customer outage risks. This alternative is not recommended.

2.7 Investment Recovery

2.7.1 Customer Impact

Distribution Project

Project C036522 results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.641 M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

Transmission Projects

Projects C042083 and C042084 result in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$0.243 M. This is indicative only. Recovery is through Local Network Service (LNS) rates

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

| Project Number | Project Type (Elec only) | Project Title | Estimate Amount (\$M) |
|----------------|--------------------------|-----------------------|-----------------------|
| C036522 | D-Sub | Kilvert Street D-Sub | 3.764 |
| C042083 | T-Sub | Kilvert Street T-Sub | 0.951 |
| C042084 | T-Line | Kilvert Street T-Line | 0.648 |
| Total | | | 5.364 |



Short Form Sanction Paper

3.2 Associated Projects

| Project Number | Project Title | Estimate Amount (\$M) |
|----------------|----------------------------|-----------------------|
| C036516 | Kilvert Street New Feeders | 3.831 |
| Total | | 3.831 |

3.3 Prior Sanctioning History

| Date | Governance Body | Sanctioned Amount | Potential Project Investment | Paper Title | Sanction Type | Tolerance |
|----------------|-----------------|-------------------|------------------------------|-----------------------------------------------------------------------------|---------------|----------------|
| July 28, 2015 | | \$2.458 M | \$4.418 M | Kilvert Street #87 Substation Second Transformer & Two New Feeder Positions | Partial | +/- 25% |
| May 28, 2013 | USSC | \$1.934 M | \$4.247 M | Kilvert Street #87 Substation Second Transformer & Two New Feeder Positions | Partial | +/- 25% |
| April 11, 2012 | USSC | \$0.300 M | \$3.200 M | Kilvert Street – 2 nd Transformer | Partial | - 25% to + 50% |



Short Form Sanction Paper

3.4 Category

| Category | Reference to Mandate, Policy, NPV, or Other |
|-------------------------------------------------|--------------------------------------------------------------------------------------------|
| <input type="radio"/> Mandatory | National Grid USA EO Internal Strategy Document Distribution Planning Criteria Strategy |
| <input checked="" type="radio"/> Policy- Driven | |
| <input type="radio"/> Justified NPV | |
| <input type="radio"/> Other | |

3.5 Asset Management Risk Score

Asset Management Risk Score: 39

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 21

3.7 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| March 2017 | Closure |



Short Form Sanction Paper

4 Financial

4.1 *Business Plan*

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|--------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Transmission – Current FY16 – FY20 Spending Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | \$0.325 M |
| Distribution – Current FY16 – FY20 Spending Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | \$0.536 M |

4.1.1 *If cost > approved Business Plan how will this be funded?*

Re-allocation of funds within the portfolio will be managed by Resource Planning to meet jurisdictional budgetary, statutory and regulatory requirements.

4.2 *CIAC / Reimbursement*

N/A



Short Form Sanction Paper

4.3 Cost Summary Table

| Project Number | Project Title | Project Estimate Level (%) | Spend | Prior Yrs | Current Planning Horizon (\$M) | | | | | | Total |
|------------------------|-----------------------|----------------------------|---------|-----------|--------------------------------|-------|-------|-------|-------|---------|-------|
| | | | | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| C036522 | Kilvert Street D-Sub | +/- 25% | CapEx | 1.291 | 1.698 | 0.751 | - | - | - | - | 3.740 |
| | | | OpEx | - | - | - | - | - | - | - | |
| | | | Removal | - | 0.012 | 0.012 | - | - | - | 0.024 | |
| | | | Total | 1.291 | 1.710 | 0.763 | - | - | - | 3.764 | |
| C042083 | Kilvert Street T-Sub | +/- 25% | CapEx | 0.272 | 0.267 | 0.412 | - | - | - | - | 0.951 |
| | | | OpEx | - | - | - | - | - | - | - | |
| | | | Removal | - | - | - | - | - | - | - | |
| | | | Total | 0.272 | 0.267 | 0.412 | - | - | - | 0.951 | |
| C042084 | Kilvert Street T-Line | +/- 25% | CapEx | 0.051 | 0.524 | 0.054 | - | - | - | - | 0.629 |
| | | | OpEx | 0.001 | 0.005 | - | - | - | - | 0.006 | |
| | | | Removal | - | 0.014 | - | - | - | - | 0.014 | |
| | | | Total | 0.052 | 0.543 | 0.054 | - | - | - | 0.649 | |
| Total Project Sanction | | | CapEx | 1.614 | 2.489 | 1.217 | - | - | - | - | 5.320 |
| | | | OpEx | 0.001 | 0.005 | - | - | - | - | 0.006 | |
| | | | Removal | - | 0.026 | 0.012 | - | - | - | 0.038 | |
| | | | Total | 1.615 | 2.520 | 1.229 | - | - | - | 5.364 | |

4.4 Project Budget Summary Table

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|--------------------|--------------------------------|-------|-------|-------|-------|---------|-------|
| | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| CapEx | 0.323 | 0.547 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.870 |
| OpEx | 0.001 | 0.006 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 |
| Removal | 0.000 | 0.011 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 |
| Total Cost in Bus. Plan | 0.324 | 0.564 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.888 |

Variance (Transmission Business Plan - Project Estimate)

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|--------------------|--------------------------------|---------|-------|-------|-------|---------|---------|
| | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| CapEx | 0.000 | (0.244) | (0.466) | 0.000 | 0.000 | 0.000 | 0.000 | (0.710) |
| OpEx | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| Removal | 0.000 | (0.003) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | (0.003) |
| Total Cost in Bus. Plan | 0.000 | (0.246) | (0.466) | 0.000 | 0.000 | 0.000 | 0.000 | (0.712) |



Short Form Sanction Paper

Project Costs per Distribution Business Plan

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| | | Yr. 1 2015/16 | Yr. 2 2016/17 | Yr. 3 2017/18 | Yr. 4 2018/19 | Yr. 5 2019/20 | Yr. 6 + 2020/21 | |
| CapEx | 1.291 | 1.100 | 0.200 | 0.000 | 0.000 | 0.000 | 0.000 | 2.591 |
| OpEx | 0.000 | 0.044 | 0.008 | 0.000 | 0.000 | 0.000 | 0.000 | 0.052 |
| Removal | 0.000 | 0.022 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 0.026 |
| Total Cost in Bus. Plan | 1.291 | 1.166 | 0.212 | 0.000 | 0.000 | 0.000 | 0.000 | 2.669 |

Variance (Distribution Business Plan - Project Estimate)

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|---------|
| | | Yr. 1 2015/16 | Yr. 2 2016/17 | Yr. 3 2017/18 | Yr. 4 2018/19 | Yr. 5 2019/20 | Yr. 6 + 2020/21 | |
| CapEx | 0.000 | (0.598) | (0.551) | 0.000 | 0.000 | 0.000 | 0.000 | (1.149) |
| OpEx | 0.000 | 0.044 | 0.008 | 0.000 | 0.000 | 0.000 | 0.000 | 0.052 |
| Removal | 0.000 | 0.010 | (0.008) | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 |
| Total Cost in Bus. Plan | 0.000 | (0.544) | (0.551) | 0.000 | 0.000 | 0.000 | 0.000 | (1.095) |

5 Key Milestones

| Milestone | Target Date: (Month/Year) |
|--------------------------------------------------|------------------------------|
| Start Preliminary Engineering (kick-off meeting) | May 2012 |
| Planning Sanction | May 2013 |
| Engineering Design Complete - EDC | January 2015 |
| Partial Sanction | July 2015 |
| Project Sanction | November 2015 |
| Construction Start | November 2015 |
| Ready for Load - RFL | September 2016 |
| Construction Complete - CC | September 2016 |
| Project Closure Sanction | March 2017 |

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Role | Individual | Responsibilities |
|---------------------|---------------|----------------------------------------------|
| Investment Planning | Michelle Park | Transmission & Distribution – New England |
| Resource Planning | Mark Phillips | Trans Line & Substation – New England |
| Resource Planning | Anne Wyman | Dist Line – New England |



Short Form Sanction Paper

| Role | Individual | Responsibilities |
|-----------------------------|-------------------|--------------------------------------------------------|
| Asset Management / Planning | Kasia Kulbacka | Trans Line / Substation & Sub-Trans Line – New England |
| Asset Management / Planning | Alan LaBarre | Dist Line / Substation & Sub-Trans Line – New England |
| Engineering & Design | Suzan Martuscello | Substations |
| Engineering & Design | Mark Browne | Trans & Sub-Trans Line |
| Engineering & Design | Leonard Swanson | Protection & Telecom |
| Project Management | Andrew Schneller | All New England |

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Reviewer List | Individual |
|--------------------------|-------------------|
| Finance | Keith Fowler |
| Finance | Philip Horowitz |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegates | Jim Patterson |
| Jurisdictional Delegates | Carol Sedewitz |
| Procurement | Art Curran |
| Control Center | Will Houston |
| Control Center | Michael Gallagher |

6.1.3 List References

| | |
|---|--------------------------------------------------------------------------------------------|
| 1 | National Grid USA EO Internal Strategy Document Distribution Planning Criteria Strategy |
| 2 | |
| 3 | |

Short Form Sanction Paper



7 Decisions

I:

(a) APPROVE the investment of \$5.364M and a tolerance of +/- 10% for the purposes of complete execution and closure.

(b) NOTE that Sean Archer is the Project Manager and Andrew Schneller has the approved financial delegation to undertake the activities stated in (a).

Signature..........Date.....11/23/15.....

Executive Sponsor – Marie Jordan, Senior Vice President, Electric Process and Engineering



Short Form Sanction Paper

8 Other Appendices

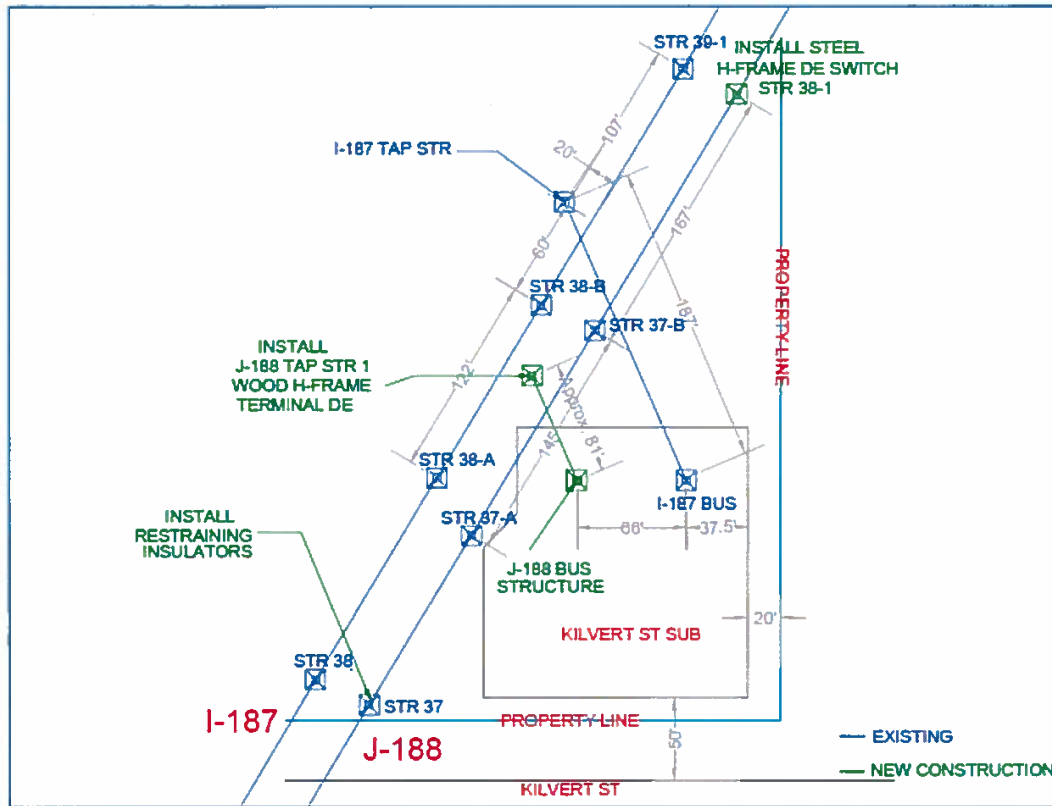
8.1 *Sanction Request Breakdown by Project*

N/A.

Short Form Sanction Paper

nationalgrid

Sketch of J-188 Tap & Mainline Construction



nationalgrid

The diagram is a hand-drawn electrical schematic showing a power distribution system. At the top left, there is a 115KV bus connected to a 12.47KV bus. The 115KV bus has a transformer labeled "NO.1 S.S. 150MVA". The 12.47KV bus has several branches leading to different pieces of equipment. These include circuit breakers labeled "F1-3", "F2-3", "F3-1", "F3-2", "F4-1", and "F4-2". There are also fuses labeled "F3-1", "F3-2", "F4-1", and "F4-2". Other components include switches labeled "S1", "S2", and "S3". There are also labels for equipment like "G", "V", and "W". A red box highlights a section of the diagram, and another red box contains the text "Replace UG Cable". The diagram includes various symbols for electrical components and their interconnections.

KILVERT ST. NO. 87
OCEAN STATE DIVISION

OS5281

C043085

D/F Sockanosset #2 TRF

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Fund Project Number: <u>C043085</u> | USSC #: <u>USSC-12-177C</u> |
| Revision: <u>2</u> | Budget Version: |
| Project Title: <u>D/F Sockanosset #2 TRF</u> | |
| Project Description: We had a conference call at 13:00 on Wednesday, 21 March 2012 about the 2 Transformer failure and subsequent replacement at Sockanosset substation in Warwick, RI. Rich St. Andre, Mike Morin, Mike Dembkowski, Chris Araujo, Endrit Fiku, Terrie Spada, Matt Pires, Paul Tomak, Dave Sharnlee, Mike Freitas, and Mike Wolf were on the call. | |

| | |
|--------------------------------------------------|-----------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>PHILLIPS, MARK</u> | Initiator: <u>Swiderski, Stanley W</u> |
| Spending Rationale: <u>Damage/Failure</u> | Funding Type: <u>P Dist by Transmission Sub RI</u> |
| Budget Class: <u>Damage/Failure</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>49</u> | Project Complexity Score: <u>18</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------|--------------|----------------|--------------------|----------------|-----------------|--------------------|------------|
| Est Start Date: <u>3/27/2012</u> | Est Complete Date: <u>4/30/2012</u> | | | | | | | | | | |
| Est In-Service Date: <u>4/30/2012</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$1,236,784</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$1,189,000</u></td> <td><u>\$4,000</u></td> <td><u>\$44,000</u></td> <td><u>\$1,237,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$1,189,000</u> | <u>\$4,000</u> | <u>\$44,000</u> | <u>\$1,237,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$1,189,000</u> | <u>\$4,000</u> | <u>\$44,000</u> | <u>\$1,237,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

<Enter data here>

Project Scope:

<Enter data here>

Project Alternatives Considered:

<Enter data here>

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>3/29/2017 12:33:04</u> | Approver | <u>monted</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C043085 Current Total Authorized Amount: \$1,23...

Title: D/F Sockanosset #2 TRF
Project Number: C043085

Budget Version No Assigned Versions

Revision: Closure
Revision Status: Approved
Revision No.: 2
Est Start Date: 03/27/2012
Est Complete Date: 12/01/2012
Est In Srvc Date: 04/30/2012

Capital: \$1,189,000.00
Expense: \$4,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$44,000.00
Total (excl. Rets.): \$1,237,000.00
Credits: \$0.00
Net: \$1,237,000.00

Revision Info: Other Updates

Revision: 2 of 2
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

This document has been reviewed for Critical
Energy Infrastructure Information (CEII).

nationalgrid

USSC Closure Paper

| | | | |
|---------------------------|-------------------------------|--------------------------|----------------------------------------------|
| Title: | D/F Sockanosset #2TRF | Sanction Paper #: | USSC-12-177C |
| Project #: | C043085 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 12/6/16 |
| Author: | Mark A Phillips | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Mark A Phillips |

1 Executive Summary

This paper is presented to close C043085. The total spend was \$1.237M. The sanctioned amount for this project was \$1.750M.

The final spend amount is \$1.237M broken down into:

\$1.189M Capex
\$0.004M Opex
\$0.044M Removal

2 Project Summary

This project installed a system spare to replace a failed unit at Sockanosset Station in Rhode Island on March 21, 2012 and a replacement spare transformer was purchased. This was required after a 23kV line fell off its pin insulator and dropped down onto a 12.47kV circuit. The feeder breaker tripped and reclosed, but the transformer failed upon the first reclose. The failed transformer was a 1972 GE 115-24kV;24/32/40 MVA unit. The new system spare transformer will be stored in Sutton.

3 Over / Under Expenditure Analysis

USSC Closure Paper



3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C043085 | D/F Sockanosset #2 TRF | Capex | 1.189 |
| | | Opex | 0.004 |
| | | Removal | 0.044 |
| | | Total | 1.237 |
| | | | |
| Total | | Capex | 1.189 |
| | | Opex | 0.004 |
| | | Removal | 0.044 |
| | | Total | 1.237 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 1.750 |
| | | Opex | 0.000 |
| | | Removal | 0.000 |
| | | Total Cost | 1.750 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | 0.561 |
| | | Opex | (0.004) |
| | | Removal | (0.044) |
| | | Total Variance | 0.513 |

3.2 Analysis

This damage failure project was sanctioned based on conceptual estimate for transformer costs prior to receiving bids from manufacturer. Actual costs reflect lower expenditure for the replacement of the bank.

4 Improvements / Lessons Learned

It is beneficial to use two work order numbers for a damage failure replacement. One work order is used to cover the installation of a spare unit and a second to cover the purchase of the replacement spare unit. This allows placing the equipment in service financially as soon as practical without having to wait until the rest of the project complete.



USSC Closure Paper

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|----------------------------|---------------------------------|---------------------------------------------------------------------------------------------|
| <i>Investment Planning</i> | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| <i>Resource Planning</i> | Mark Phillips | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management/Planning | Alan T. Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Suzan E. Martuscello | Endorses scope, design, conformance with design standards |
| Project Management | Andrew Schneller Sonny Anand | Endorses resources, cost estimate, schedule |



USSC Closure Paper

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|----------------------------|--------------------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate(s) | Jim Patterson |
| Procurement | Art Curran |
| Control Centers (CC) | Michael Gallagher/Will Houston |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature.....*CK*.....Date...*3/24/17*.....

Christopher Kelly

Senior Vice President Electric Process and Engineering

C044972

LN13_Paving and sewer

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C044972</u> Revision: <u>2</u> Project Title: <u>LN13 Paving and sewer</u> Project Description: Repave & sealcoat parking and stores lots, tie building into town sewer system and relocate motorized gate | USSC #: Budget Version: <u>Default</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Status: <u>Closed</u> Responsible Person: <u>BURNS, PATRICK</u> Spending Rationale: Budget Class: Capital by Category: Program Code: Project Risk Score: | Initiator: <u>Del Castillo, Maricelis</u> Funding Type: <u>P Electric GenPlant Fac IT Share</u> Project Complexity Score: |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|

Project Schedule / Expenditures

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Revision Status: <u>Approved</u> Est Start Date: <u>10/15/2012</u> Est In-Service Date: <u>12/31/2012</u> TTD Actuals: <u>\$611,695</u> | Est Complete Date: <u>12/31/2012</u> As Of: <u>10/2/2017</u> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|

| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
|----------------|------------------|----------------|------------------|------------------|----------------|
| | <u>\$521,360</u> | <u>\$0</u> | <u>\$100,500</u> | <u>\$621,860</u> | <u>\$0</u> |

Justification / Risk Identification:

Project Scope:

Project Alternatives Considered:

Additional Notes:

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|----------------------------|----------|---------------|-------------------|
| Line 1: | Date | <u>12/10/2013 13:57:07</u> | Approver | <u>burnsp</u> | <u>Approver 1</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 421 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPPlan Help Calc Print Win

Funding Project Estimates - Summary C044972 Current Total Authorized Amount: \$621,...

Title LN13_Paving and sewer
Project Number C044972

Budget Version Default (active)
Revision Increase DOA
Revision Status Approved
Revision No. 2
Est Start Date 10/15/2012
Est Complete Date 09/01/2013
Est In Svc Date 12/31/2012
Capital \$521,360.00
Expense \$0.00
Jobbing \$0.00
Retirement \$0.00
Removal \$100,500.00
Total (excl. Rets.) \$621,860.00
Credits \$0.00
Net \$621,860.00

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare
Close

Revision Info Other Updates
Revision 2 of 2
Find Revision
Send for Approval
Show 'Budget Only' Revisions

Record 1 of 1
Audits

C045657

DOTR-Repl Bridges No.475 & 476 E.P.

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C045657</u> | USSC #: - |
| Revision: <u>2</u> | Budget Version: <u>Default</u> |
| Project Title: <u>DOTR-Repl Bridges No.475 & 476 E.P.</u> | |
| Project Description: 100% Reimbursable-RIDOT has proposed replacement of East Shore Expressway Bridge No. 475 (over Warren Avenue) and McCormick Auarry Bridge No. 476 (over Warren Avenue) in East Providence. This authorization is for preliminary engineering to determine scope of work with RIDOT | |

| | |
|-------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>CAPOBIANCO, THOM</u> | Initiator: <u>Capobianco III, Thom</u> |
| Spending Rationale: <u>Customer Request/Public Require</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Public Requirements</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>49</u> | Project Complexity Score: <u>15</u> |

Project Schedule / Expenditures

| | | | | | |
|----------------------------------------------|-----------------------|-----------------------|--------------------------------------------|---------------------|-----------------------|
| Revision Status: <u>Approved</u> | | | | | |
| Est Start Date: <u>12/18/2012</u> | | | Est Complete Date: <u>3/31/2017</u> | | |
| Est In-Service Date: <u>3/31/2017</u> | | | | | |
| TTD Actuals: <u>\$278,417</u> | | | As Of: <u>10/2/2017</u> | | |
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$221,000</u> | <u>\$26,000</u> | <u>\$13,000</u> | <u>\$260,000</u> | <u>\$0</u> |

Justification / Risk Identification:

RIDOT has proposed replacement of East Shore Expressway Bridge No. 475 (over Warren Avenue) and McCormick Auarry Bridge No. 476 (over Warren Avenue) in East Providence. This authorization is for preliminary engineering to determine scope of work with RIDOT.

Project Scope:

<Enter data here>

Project Alternatives Considered:

<Enter data here>

Additional Notes:

Sanction from \$50K to \$260K document attached. Original DOA for 50,000 was for preliminary engineering only. This is the final design estimate submitted to RI DOT for 100% reimbursement.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|----------------|-------------|----------------------------|-----------------|--------------------------|-------------------------------|
| Line 1: | Date | <u>10/8/2015 17:09:49</u> | Approver | <u>curljo</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date | <u>10/12/2015 09:54:14</u> | Approver | <u>Park, Michelle L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date | <u>10/13/2015 11:00:41</u> | Approver | <u>Hellmuth, Kevin J</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date | <u>10/16/2015 16:06:50</u> | Approver | <u>Cox, Roger D</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date | <u>10/26/2015 14:04:20</u> | Approver | <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 425 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C045657 Current Total Authorized Amount: \$260,...

Title: D0TR-Repl Bridges No. 475 & 476 E.P.
Project Number: C045657

Budget Version Default (active)
Revision: SN Form
Revision Status: Approved
Revision No.: 2
Est Start Date: 12/18/2012
Est Complete Date: 03/31/2017
Est In Srv Date: 03/31/2017
Capital: \$221,000.00
Expense: \$26,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$13,000.00
Total (excl. Rets.): \$260,000.00
Credits: \$0.00
Net: \$260,000.00

Revision Info: Other Updates

Revision: 2 of 2
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close

Send for Approval

Change in DOA Request Form **(Less than Million)**

Version 9.0

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Electric - Janice Flynn

| | |
|-------------------------|-------------------------------------|
| *Date: | 9/4/2015 |
| *Operating Company: | The Narragansett Electric Co. |
| *PowerPlant Project Id: | C045657 |
| *Project Name: | DOT-Repl Bridges No. 475 & 476 E.P. |
| *Project Engineer: | Richard M. Botelho |
| *Project Manager: | Thomas Capobianco |

Latest Project Estimate

| | |
|---------------------------|------------|
| *Date of Latest Sanction: | 12/20/2012 |
|---------------------------|------------|

| Total | Capex | Opex | Removal |
|----------|----------|------|---------|
| \$50,000 | \$50,000 | \$0 | \$0 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|----------|----------|
| \$260,000 | \$221,000 | \$26,000 | \$13,000 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|----------|------|---------|
| \$18,000 | \$18,000 | \$0 | \$0 |

| Current FY | Capex | Opex | Removal |
|------------|-----------|----------|---------|
| \$121,000 | \$101,500 | \$13,000 | \$6,500 |

| FY+1 | Capex | Opex | Removal |
|-----------|-----------|----------|---------|
| \$121,000 | \$101,500 | \$13,000 | \$6,500 |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| | |
|--|--|
| | |
|--|--|

Reason for Revision

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process |
| | New Project Estimated Completion Date: 3/31/2017 |

| | |
|--------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|--------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending **(Please expand the row height if box doesn't fit)**

| | |
|-------------------------------------|--------------------------------------------|
| <input checked="" type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|-------------------------------------|--------------------------------------------|

Change in DOA Request Form (Less than Million)

| | |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Original DOA for 50,000 was for preliminary engineering only. This is the final design estimate submitted to RI DOT for 100% reimbursement.</p> |
| <input type="checkbox"/> | <p>Resource Allocation (Schedule, Delay, OT, or Contractor)</p> |
| <input type="checkbox"/> | <p>Low/High Estimate</p> |
| <input type="checkbox"/> | <p>External Forces (Permitting Requirements, Weather, Contractor Issues, etc)</p> |

In-service Dates

*Original In-service Date: 12/31/2015
*Revised In-service Date: 12/31/2016

C045680

MELR13_Replace windows

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|--------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C045680</u> | USSC #: <u>USSC-13-085</u> |
| Revision: <u>2</u> | Budget Version: <u>Default</u> |
| Project Title: <u>MELR13 Replace windows</u> | |
| Project Description: REMOVE AND REPLACE WINDOWS | |

| | |
|------------------------------------------------|-------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>O'ROURKE, ED</u> | Initiator: <u>Hutton, Rebekah M</u> |
| Spending Rationale: | Funding Type: <u>P FAC Electric Capital RI</u> |
| Budget Class: | |
| Capital by Category: | |
| Program Code: <u>N/A (non Max)</u> | |
| Project Risk Score: | Project Complexity Score: <u>12</u> |

Project Schedule / Expenditures

| | |
|----------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>12/15/2012</u> | Est Complete Date: <u>6/30/2016</u> |
| Est In-Service Date: <u>6/30/2016</u> | |
| TTD Actuals: <u>\$2,017,620</u> | As Of: <u>10/2/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$2,800,000</u> | <u>\$0</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$820,000</u> | <u>\$3,620,000</u> |
| | <u>Credits</u> |
| | <u>\$0</u> |

Justification / Risk Identification:

EXISTING WINNDOWS LEAK AND PROVIDE INADEQUATE INSULATING PERFORMANCE

Project Scope:

REMOVE AND REPLACE WINDOWS

Project Alternatives Considered:

<Enter data here>

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|--------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>2/3/2014 09:53:50</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C045680 Current Total Authorized Amount: \$3,62,...

Title: MELR13_Replace windows
Project Number: C045680

Budget Version Default (active)
Revision: 13-085
Revision Status: Approved
Revision No.: 2
Est Start Date: 12/15/2012
Est Complete Date: 06/30/2016
Est In Srvc Date: 06/30/2016
Capital: \$2,800,000.00
Expense: \$0.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$820,000.00
Total (excl. Rets.): \$3,620,000.00
Credits: \$0.00
Net: \$3,620,000.00

Revision Info: Other Updates

Revision: 2 of 2
Find Revision
Send for Approval
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare
Close

Record: 1 of 1
Audits



US Sanction Paper

| | | | |
|---------------------------|----------------------------------------|--------------------------|-------------|
| Title: | Melrose St. Window Replacement Program | Sanction Paper #: | USSC-13-085 |
| Project #: | C045690 | Sanction Type: | Sanction |
| Operating Company: | Narragansett Electric Company. | Date of Request: | 2/27/13 |
| Author: | Patrick Burns | | Rudy Wynter |
| Utility Service: | Property | Project Manager: | Tom Wall |

1 Executive Summary

1.1 Sanctioning Summary:

This paper requests sanction of Melrose St Window Replacement Program, in the amount of \$ 3,620,000 with a tolerance of 10% for the purposes of engineering, and construction to replace the windows at the Melrose St. operations facility in Providence, RI over a four to five year period.

The sanction amount is \$ 3,620,000 broken down into:

\$3,020,000 Capex
\$ 600,000 Removals

1.2 Brief Description:

The Melrose St facility in Providence, RI was constructed in the 1920s. Many of the windows are wood framed, single pane construction and are failing. The wood framing is rotting and air and water penetrate the buildings around the windows. There was an isolated incident in 2012 where panes of glass fell out of the windows in the Heavy Stores area. The glass in that area has been secured. Window replacement will be staged over a number of years, with the oldest windows replaced first.

1.3 Summary of Projects:

| Project Number | Project Title | Estimate Amount |
|----------------|--------------------------------|--------------------|
| C045690 | Melrose St. Window Replacement | \$3,620,000 |
| | Total | \$3,620,000 |



| Project Number | Project Title | |
|----------------|---------------|--|
| | | |
| | | |
| | | |
| | Total | |

| Date | Governance Body | Sanctioned Amount | Paper Title | Sanction Type |
|------|-----------------|-------------------|-------------|---------------|
| | | | | |
| | | | | |
| | | | | |

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| 2/2018 | Project Closure |

| Category | Reference to Mandate, Policy, or NPV Assumptions |
|--------------------------------------------|-------------------------------------------------------------------|
| <input checked="" type="radio"/> Mandatory | The windows at this facility are failing and require replacement. |
| <input type="radio"/> Policy- Driven | |
| <input type="radio"/> Justified NPV | |



US Sanction Paper

1.8 Asset Management Risk Score

Asset Management Risk Score: n/a

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability ☐ Environment ☐ Health & Safety ☒ Not Policy Driven

1.9 Complexity Level: (if applicable)

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: _12_

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☐ Yes ☒ No

1.11 Business Plan:

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|-----------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------|
| Facilities Management Capital; Plan FY13-FY17 | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input type="radio"/> Over <input checked="" type="radio"/> Under | \$0.0 |

1.12 If cost > approved Business Plan how will this be funded?

Capital costs are included in Facilities Management capital plan.



US Sanction Paper

1.13 Current Planning Horizon:

| | Prior Yrs | Current Planning Horizon | | | | | | Total |
|---------------------|-----------|--------------------------|---------|---------|---------|---------|---------|--------|
| | | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 | Yr 6+ | |
| | | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | |
| Capex | \$0.00 | \$0.00 | \$0.70 | \$0.70 | \$0.70 | \$0.70 | | \$2.80 |
| Opex | | 0 | | | | | | \$0.00 |
| Removal | | \$0.02 | \$0.20 | \$0.20 | \$0.20 | \$0.20 | | \$0.82 |
| CIAC/ Reimbursement | | | | | | | | \$0.00 |
| Total | \$0.00 | \$0.02 | \$0.90 | \$0.90 | \$0.90 | \$0.90 | \$0.00 | \$3.62 |

1.14 Resources:

| Resource Sourcing | | | |
|--------------------------------------------------------|-----------------------------------|------------------------------------------------|----------------------------------------|
| Engineering & Design Resources to be provided | <input type="checkbox"/> Internal | <input checked="" type="checkbox"/> Contractor | |
| Construction/Implementation Resources to be provided | <input type="checkbox"/> Internal | <input checked="" type="checkbox"/> Contractor | |
| Resource Delivery | | | |
| Availability of internal resources to deliver project: | <input type="radio"/> Red | <input checked="" type="radio"/> Amber | <input type="radio"/> Green |
| Availability of external resources to deliver project: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |
| Operational Impact | | | |
| Outage impact on network system: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |
| Procurement impact on network system: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |

1.15 Key Issues (include mitigation of Red or Amber Resources):

| | |
|---|------------------------------------------------------------------------------------------|
| 1 | If necessary a 3 rd party PM resource will be utilized to manage this project |
| 2 | |
| 3 | |



US Sanction Paper

1.16 Key Milestones:

| Milestone | Target Date: (Month/Year) |
|--------------------|------------------------------|
| Bid Construction | 2/2013 |
| Sanction | 2/2013 |
| Begin Construction | 5/2013 |
| | |
| | |
| | |
| | |
| | |
| | |

1.17 Climate Change:

| | | |
|----------------------------------------------------------------------|------------------------------------------|-------------------------------------------|
| Are financial incentives (e.g. carbon credits) available? | <input type="radio"/> Yes | <input checked="" type="radio"/> No |
| Contribution to National Grid's 2050 80% emissions reduction target: | <input type="radio"/> Neutral | <input checked="" type="radio"/> Positive |
| Impact on adaptability of network for future climate change: | <input checked="" type="radio"/> Neutral | <input type="radio"/> Positive |
| | | <input type="radio"/> Negative |

1.18 List References:

| | |
|---|--|
| 1 | |
| 2 | |



US Sanction Paper

Decisions

The US Sanctioning Committee (USSC) at a meeting held on 2/27/2013:

(a) APPROVED this paper and the investment of \$3.62M and a tolerance of +/- 10 % for the total project costs.

(b) NOTED that Tom Wall is the Project Manager and has the approved financial delegation to undertake the activities stated in (a).

Signature.....Date.....

Lee S. Eckert

US Chief Financial Officer

Chairman, US Sanctioning Committee



US Sanction Paper

2 Sanction Paper Detail

| | | | |
|---------------------------|---------------------------------------|--------------------------|-------------|
| Title: | Melrose St Window Replacement Program | Sanction Paper #: | USSC-13-085 |
| Project #: | CO 45680 | Sanction Type: | Sanction |
| Operating Company: | NECO | Date of Request: | 2/27/13 |
| Author: | Patrick Burns | Sponsor: | Rudy Wynter |
| Utility Service: | Property | Project Manager: | Tom Wall |

2.1 Background

The Melrose St facility in Providence, RI was constructed in the 1920s. Many of the windows are wood framed, single pane construction and are failing. The wood framing is rotting and air and water penetrate the buildings around the windows. There was an isolated incident in 2012 where panes of glass fell out of the windows in the stock room area. The glass in that area has been secured. Window replacement will be staged over a number of years, with the oldest windows replaced first.

2.2 Drivers

Windows have failed and a few have fallen out, as a result all have been secured, however, some have been replaced with plywood. The windows are failing and allowing both air and water to penetrate the facility.

2.3 Project Description

Window replacement of over 550 windows will occur over a number of years. The exiting window frames and surrounding area will be tested fro environmental contaminants. Upon completion of any environmental remediation, the windows will be removed and replaced. Window replacement will be completed on building at a time.

2.3 Benefits Summary

Replacing the windows will increase the safety of the occupants and increase the energy efficiency of the complex.

2.4 Business Issues

The projected overall project costs are included in Facilities Management's FY14 – Fy18 capital budget. This program is supported by the RI jurisdiction.



US Sanction Paper

2.5 Alternatives

Alternative 1: Do Nothing. The windows will continue to deteriorate at an accelerated rate which could lead to both health and safety issues.

Alternative 2: Repair only the failing windows. This will eliminate any ongoing safety concerns, however, will continue to allow air and water infiltration into the complex.

Alternative 3: Defer this project until next fiscal year.

2.6 Safety, Environmental and Project Planning Issues

Safety

Personnel shall ensure they are following the latest procedures for the work they are undertaking. This will be accomplished by putting together a health and safety plan and by ensuring oversight with adequate supervision. Proper clothing and PPE shall be worn by all working on the project.

Environment

Construction will adhere to appropriate existing environmental policies and procedures. All windows will be tested for contaminants prior to their removal to allow for proper removal and disposition.

No public outreach will be necessary as construction will occur in a facility currently owned and operated by National Grid.

2.7 Execution Risk Appraisal

| Number | Detailed Description of Risk / Opportunity | Probability | Impact | | Score | | Strategy | Pre-Trigger Mitigation Plan | Residual Risk | Post Trigger Mitigation Plan |
|--------|-------------------------------------------------------------|-------------|--------|----------|-------|----------|----------|--------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------|
| | | | Cost | Schedule | Cost | Schedule | | | | |
| 1 | Unforeseen Conditions During Construction | 3 | 3 | 3 | 9 | 9 | Mitigate | Work closely w/ A&E and contractor to identify potential areas of concern and develop solutions. | Change in scope effects costs and schedule | Continue to monitor contractor performance. |
| 2 | Environmental Contamination encountered during construction | 3 | 4 | 3 | 12 | 9 | Mitigate | Work closely with Environmental to test ahead of construction | Project is delayed | Meet weekly with Environmental to keep project on track |



US Sanction Paper

2.8 Permitting

| Permit Name | Probability Required (Certain/ Likely/ Unlikely) | Duration | Status (Complete/ In Progress Not Applied For) | Estimated Completion Date |
|--------------------|--------------------------------------------------|----------|------------------------------------------------|---------------------------|
| Asbestos Abatement | Likely | 30 days | Not applied For | 3/15/2013 |
| | | | | |

2.9 Investment Recovery

2.9.1 Investment Recovery and Regulatory Implications

Investment recovery will be through standard rate recovery mechanisms approved by appropriate regulatory agencies.

2.9.2 Customer Impact

This project results in a more engaged workforce working out of a much improved environment.

2.9.3 CIAC / Reimbursement

None

2.10 Financial Impact to National Grid

2.10.1 Cost Summary Table

| Project Title | Project Number | Project Estimate | Spend | Prior Yrs | Current Planning Horizon | | | | | | Total |
|--------------------------------|----------------|------------------|---------|-----------|--------------------------|--------|--------|--------|--------|--------|--------|
| | | | | | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 | Yr 6+ | |
| Melrose St. Window Replacement | C04966 | +/- 10% | Capex | 0 | \$0.00 | \$0.70 | \$0.70 | \$0.70 | \$0.70 | | \$2.80 |
| | | | Opex | | \$0.00 | | | | | | \$0.00 |
| | | | Removal | | \$0.02 | \$0.20 | \$0.20 | \$0.20 | \$0.20 | | \$0.82 |
| | | | Total | \$0.00 | \$0.02 | \$0.90 | \$0.90 | \$0.90 | \$0.90 | \$0.00 | \$3.62 |



US Sanction Paper

It is expected that the plant will be capitalized when each phase of the program is placed in service

2.10.2 Project Budget Summary Table

Project Costs Per Business Plan

| Spend | Prior Yrs | Current Planning Horizon | | | | | | Total |
|-------------------------|-----------|--------------------------|-----------------|-----------------|-----------------|-----------------|------------------|--------|
| | | Yr 1 2012/13 | Yr 2 2013/14 | Yr 3 2014/15 | Yr 4 2015/16 | Yr 5 2016/17 | Yr 6+ 2017/18 | |
| Capex | | \$0.00 | \$0.70 | \$0.70 | \$0.70 | \$0.70 | | \$2.80 |
| Opex | | \$0.00 | | | | | | \$0.00 |
| Removal | | \$0.02 | \$0.20 | \$0.20 | \$0.20 | \$0.20 | | \$0.82 |
| Total Cost in Bus. Plan | \$0.00 | \$0.02 | \$0.90 | \$0.90 | \$0.90 | \$0.90 | \$0.00 | \$3.62 |

Variance

| Spend | Prior Yrs | Current Planning Horizon | | | | | | Total |
|-------------------------|-----------|--------------------------|-----------------|-----------------|-----------------|-----------------|------------------|--------|
| | | Yr 1 2012/13 | Yr 2 2013/14 | Yr 3 2014/15 | Yr 4 2015/16 | Yr 5 2016/17 | Yr 6+ 2017/18 | |
| Capex | | \$0.00 | \$0.00 | | | | | \$0.00 |
| Opex | | | | | | | | \$0.00 |
| Removal | | \$0.00 | \$0.00 | 0 | | | | \$0.00 |
| Total Cost in Bus. Plan | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 | \$0.00 |

2.10.3 Cost Assumptions

Costs are based upon competitive bids for the construction of the project.

2.11 Statements of Support

2.11.1 Supporters

| Role | Name | Responsibilities |
|--------------------------|-----------|------------------|
| Jurisdictional President | Tim Horan | RI Jurisdiction |
| | | |
| | | |



US Sanction Paper

2.11.2 Reviewers

Reads paper for content / language. Recommends edits if necessary

| Reviewer List | Name |
|--------------------------|---------------|
| Finance | Paul Flaherty |
| Regulatory | Gideon Katsh |
| Jurisdictional Delegates | |

3 Appendices

3.1 Sequence of Window Replacement

Heavy Stores
Light Stores
Connector Building
Office Building
Line Shed
Underground
Boiler House
Garage

C046352

Volt Var Dline RI Pilot Project

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046352</u> | USSC #: <u>USSC-14-009 v5</u> |
| Revision: <u>8</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Volt Var Dline RI Pilot Project</u> | |
| Project Description: <u>UoF RI Volt/Var Mgmt Pilot Project</u> | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>SKRZYPCZAK, JOHN</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>25</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------|--------------|----------------|--------------------|------------------|-----------------|--------------------|------------|
| Est Start Date: <u>4/1/2013</u> | Est Complete Date: <u>8/30/2017</u> | | | | | | | | | | |
| Est In-Service Date: <u>4/30/2017</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$5,249,679</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table style="width: 100%; border: none;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$4,387,000</u></td> <td><u>\$475,000</u></td> <td><u>\$98,000</u></td> <td><u>\$4,960,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$4,387,000</u> | <u>\$475,000</u> | <u>\$98,000</u> | <u>\$4,960,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$4,387,000</u> | <u>\$475,000</u> | <u>\$98,000</u> | <u>\$4,960,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

UoF RI Volt/Var Mgmt Pilot Project

Project Scope:

Through these projects, National Grid will pursue a Volt VAR Optimization (VVO) Demonstration Project in the state of Rhode Island. National Grid has selected Utilidata to supply centralized control functionality designed to optimize the operation of existing and new reactive resources as well as various voltage regulation devices on seven distribution feeders selected for the demonstration project.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>7/18/2016 12:38:14</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046352 Current Total Authorized Amount: \$4,96...

Title Volt Var Dline RI Pilot Project

Project Number C046352

Budget Version Default (active)

Revision v5

Revision Status Approved

Revision No. 8

Est Start Date 04/01/2013

Est Complete Date 08/30/2017

Est In Srvc Date 04/30/2017

Capital \$4,387,000.00

Expense \$475,000.00

Jobbing \$0.00

Retirement \$0.00

Removal \$98,000.00

Total (excl. Rets.) \$4,960,000.00

Credits \$0.00

Net \$4,960,000.00

Revision Info Other Updates

Revision 8 of 8

Find Revision

Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Version Compare

Close

Record 1 of 1

Audits



Short Form Sanction Paper

| | | | |
|---------------------------|---------------------------------------------|--------------------------|---------------------------------------------------------------------|
| Title: | Volt Var Optimization Demonstration Project | Sanction Paper #: | USSC-14-009 v5 |
| Project #: | C046352, C052708, C053111 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | July 12, 2016 |
| Author: | John Skrzypczak | Sponsor: | Carol A. Sedewitz Vice President Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | John Skrzypczak |

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of projects C046352, C052708, and C053111 in the amount \$6.594M with a tolerance of +/- 10% for the purposes of full implementation.

The sanction amount is \$6.594M broken down into:

| | |
|----------|---------|
| \$5.837M | CapEx |
| \$0.652M | OpEx |
| \$0.105M | Removal |

1.2 Project Summary

Through these projects, National Grid will pursue a Volt VAR Optimization (VVO) Demonstration Project in the state of Rhode Island. National Grid has selected Utilidata to supply centralized control functionality designed to optimize the operation of existing and new reactive resources as well as various voltage regulation devices on seven distribution feeders selected for the demonstration project.

At the time of this sanction, VVO is currently enabled on 2 feeders in the Putnam Pike area, and the third feeder will be online with the addition of 5 cellular radios. As this pilot sought not only to explore the potential of VVO, but also the performance of a private mesh network, the switch to a public cellular carrier has significant impacts on being able to finish the project for a reduced cost.



Short Form Sanction Paper

2 Project Detail

2.1 Project Description

Please note that the results of the Trilliant RF study may have an impact on the Distribution Line design and associated costs.

Infrastructure Development

Table 1 shows Putnam Pike distribution infrastructure development, which includes the installation of voltage regulators, capacitor banks, and step-down transformer removals/installations and associated area voltage conversion. The area voltage conversion calls for one 4kV voltage regulator to be removed and approximately 4200 circuit feet to be converted to 12.47kV.

The Putnam Pike substation regulator controllers will be replaced with Beckwith M-2001D units, which meet current standards and enables device supervisory control.

| Putnam Pike | Line Regulators | Step-down Transformers | Capacitor Banks | Cap Controls (SEL 734B) | Convert (mi) | Load Balancing |
|--------------------|------------------------|-------------------------------|------------------------|--------------------------------|---------------------|-----------------------|
| Install | 9 | | 4 | | | |
| Remove | 1 | | | | | |
| Replace | 3 | 3 | | 11 | 0.80 | 20 |

TABLE 1: PUTNAM PIKE ASSETS

Table 2 shows the recommended Tower Hill distribution infrastructure development which includes the installation of voltage line regulators and capacitor banks. There is no recommended work at the substation.

| Tower Hill | Line Regulators | Step-down Transformers | Capacitor Banks | Cap Controls (SEL 734B) | Convert (mi) | Load Balancing |
|-------------------|------------------------|-------------------------------|------------------------|--------------------------------|---------------------|-----------------------|
| Install | 9 | | 3 | | | |
| Remove | | | | | | |
| Replace | | | | 16 | | 23 |

TABLE 2: TOWER HILL ASSETS



Short Form Sanction Paper

Table 3 summarizes the total infrastructure development on the circuits out of Putnam Pike and Tower Hill substations. Figures 1-5 shows electrical one-lines of specific asset locations for the various feeders involved in the demonstration project.

| Total | Line Regulators | Step-down Transformers | Capacitor Banks | Cap Controls (SEL 734B) | Convert (mi) | Load Balancing |
|---------|-----------------|------------------------|-----------------|-------------------------|--------------|----------------|
| Install | 18 | | 7 | | | |
| Remove | 1 | | | | | |
| Replace | 3 | 3 | | 27 | 0.80 | 43 |

TABLE 3: TOTAL ASSETS

IS Scope

- Survey and design for establishing radio network between 40 field devices in Putnam pike (Line Voltage regulators, Line Voltage monitors and Capacitor bank controllers) with Trilliant Wireless station.
- Establish Multi-Protocol Label Switch (MPLS) network connectivity between Trilliant Wireless station and Northborough data center / Utilidata server location.
- Establish authentication mechanism for the radios using existing Smart grid Authentication servers.
- 1 router/1 Out of Band at each Nooseneck and Peck Hill towers to support the new circuit
- Establish MPLS network connectivity from Tower Hill and Putnam Pike substations to Northborough data center / Utilidata server location.
- Installation of Adaptivolt VVO software and testing connectivity between systems (hardware installation and commissioning being managed by Engineering team and configuration by Utilidata), setting up ESP network for Utilidata server components in data center.
- Establish network connectivity between the National Grid EMS Network and Utilidata Adaptivolt system.
- Implement Secure Shell File Transfer Protocol to facilitate the (daily or weekly) transfer data to Utilidata for Measurement & Verification analysis.
- Provide access to Engineering and Utilidata users for support and maintenance of field devices, Utilidata VVO System, and network devices through the IPSEC VPM .
- Track potential benefits from deployment and infrastructure development costs to enable future system planning.

The pilot sought to not only explore the VVO functionality, but also to explore the deployment of a private mesh area network. For the project, through an RFP, Trilliant was selected to provide this RF network for both areas. However, after significant issues with the deployment, the project team has elected to use cellular for the remainder of the project. Some of the causes for this shift are:



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- The Trilliant Network Management Software is consuming far more information than appropriate, necessary, or predicted.
- The Network has become very 'tower centric' with relatively low 'mesh capability'
- The Trilliant devices appear to require additional pole extensions and taller poles than expected to achieve reasonable performance
- The Trilliant network has a limitation of 10 hops, which was not disclosed prior to start of deployment
- A significant number of radio's have required RMA

These issues have increased the project costs beyond what has been anticipated, and led to the need for 170% more poles to be modified for the project in the Putnam Pike area, as well as multiple visits per pole. Switching to cellular will keep the field installation simple, with no risk of expansion, and requires only minor firewall rules and additional hardware to complete.

2.2 Benefits

The benefits of distribution feeder reactive support and voltage regulation are well known and individual capacitor installations and voltage regulators can be justified to maintain service voltage within required limits and to release capacity on T&D assets. It is believed that a more refined control system will allow the Company to meet its service quality requirements while reducing system losses and reducing customer energy consumption. However, National Grid has not yet evaluated the potential for achieving these additional benefits to be derived from advanced VVO control systems and strategies utilizing centralized control algorithms.

This project is recommended at this time for the following reasons:

- To quantify the potential operational benefits from these systems as stated by the manufacturer in order to improve service to National Grid customers
- To understand potential synergies with other rapidly developing uses of advanced technology on power distribution systems
- To understand how application of these systems could be integrated with existing guidelines to meet current objectives for volt/VAR infrastructure
- To guide system planners on potential benefits from this type of deployment
- To understand system performance when distribution is out of normal configuration

Direct benefits the demonstration project seeks to quantify are as follows:

- Reduction in system losses
- Reduction in customer energy use
- Improvement in voltage performance
- Reduction in feeder demand
- Improved flexibility to meet NE ISO pf performance



Short Form Sanction Paper

- Improved planning & operations capability as a result of increased system performance monitoring

The criteria used for selecting the distribution feeders that are proposed in the demonstration project are as follows:

- 15kV feeder class
- Some level of existing automation Energy Management System (EMS) at substation
- Existing Line capacitors
- At least one set of line regulators on a feeder served by a target substation

Table 4 shows the characteristics of an average Rhode Island feeder with comparison to the feeders that were selected. The selected feeders tended to be longer than the average feeder due to the desire to evaluate a feeder that had distribution line regulators installed.

| VVO Feeder Selection Analysis | # of Feeders | Customers | Total Miles | OH Miles | UG Miles | 3Ph OH Miles | Cap Banks | kVAR | 3PH Line Regs |
|-------------------------------|--------------|-----------|-------------|----------|----------|--------------|-----------|----------|---------------|
| RI 15 kV Averages | 222 | 1,789 | 23.8 | 20.1 | 3.8 | 7.9 | 3.6 | 2,804.8 | 0.09 |
| RI Target Sample Averages | 51 | 2,031 | 38.0 | 32.1 | 5.9 | 11.3 | 4.3 | 3,066.7 | 0.37 |
| Test Sample Averages | 7 | 2,286 | 47.5 | 40.4 | 6.6 | 13.8 | 4.9 | 3,800.0 | 0.4 |
| Test Sample Totals | 7 | 16,000 | 332.1 | 282.5 | 46.3 | 96.9 | 34.0 | 26,600.0 | 3.00 |

TABLE 4: VVO SELECTION ANALYSIS

The selected feeders for this demonstration project are Putnam Pike 38F1, 38F3, 38F5 in the northern area. In the southern area Tower Hill 88F1, 88F3, 88F5, and the 88F7 were selected. Although the 88F7 feeder is not yet in service, its circuit characteristics were assembled from the portions of existing circuits (including the Lafayette substation feeder 30F2) that will be used to establish its normal configuration.

Required infrastructure development was determined to address existing concerns related to thermal, voltage, and reactive performance before advanced VVO could be executed.



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2.3 Business & Customer Issues

2.4 Alternatives

Alternative 1: Do Nothing

This solution was rejected after a comprehensive project study report was completed to evaluate the benefits of current National Grid volt VAR management methods versus this proposed advanced volt VAR management solution with two-way communications and a centralized algorithm controlling voltage regulators and capacitor banks. The results of this report were presented to internal stakeholders as well as the Rhode Island Public Utilities Commission staff. Note, the internal study recommended pursuing this project's advanced volt var management solution in lieu of remaining with the currently used method.

2.5 Investment Recovery

Investment Recovery will be through standard rate recovery mechanisms.

2.5.1 Customer Impact

This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$1.015M. This is indicative only. The actual revenue requirement will differ, depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

3 Related Projects, Scoring, Budgets

3.1 Summary of Projects

| Project Number | Project Type (Elec only) | Project Title | Estimate Amount (\$M) |
|----------------|-----------------------------|------------------------|--------------------------|
| C046352 | D-Line | VVO Pilot Distribution | 4.960 |
| C052708 | D-Sub | VVO Pilot Substation | 0.228 |
| C053111 | IS | VVO Pilot IS | 1.406 |
| Total | | | 6.594 |

3.2 Associated Projects

N/A



Short Form Sanction Paper

3.3 Prior Sanctioning History

Describe previous sanctions for the projects included in the scope of this paper (Newest to Oldest).

| Date | Governance Body | Sanctioned Amount | Potential Project Investment | Paper Title | Sanction Type | Tolerance |
|------------|-----------------|-------------------|------------------------------|---------------------------------------------|-------------------|--------------|
| 01/19/2016 | USSC | \$5.435M | \$6.235M | Volt Var Optimization Demonstration Project | Partial | +25% |
| 06/23/2015 | USSC | \$4.239M | \$4.913M | Volt Var Optimization Demonstration Project | Partial | +25% |
| 11/04/2014 | USSC | \$3.000M | \$4.795M | Volt Var Optimization Demonstration Project | Partial | +25% |
| 01/14/2014 | USSC | \$1.200M | \$4.232M | Volt Var Optimization Demonstration Project | Partial | +25% |
| 12/03/2013 | Powerplant | \$0.500M | N/A | Volt Var Optimization Demonstration Project | Rob Sheridan, DOA | +50% -25% |



Short Form Sanction Paper

3.4 Category

| Category | Reference to Mandate, Policy, NPV, or Other |
|-------------------------------------------------|---------------------------------------------|
| <input type="radio"/> Mandatory | Advanced Volt Var Management |
| <input checked="" type="radio"/> Policy- Driven | |
| <input type="radio"/> Justified NPV | |
| <input type="radio"/> Other | |

3.5 Asset Management Risk Score

Asset Management Risk Score: 36

Primary Risk Score Driver: (Policy Driven Projects Only)

☒ Reliability ☐ Environment ☐ Health & Safety ☐ Not Policy Driven

3.6 Complexity Level

☐ High Complexity ☒ Medium Complexity ☐ Low Complexity ☐ N/A

Complexity Score: 25

3.7 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| 8/2017 | Closeout Sanction |



Short Form Sanction Paper

4 Financial

4.1 Business Plan

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|--------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------|
| FY17-21 NE Distribution Capital Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | \$0.584M |

4.1.1 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio has been managed by Resource Planning to meet jurisdictional budgetary, statutory and regulatory requirements.

4.2 CIAC / Reimbursement

N/A

4.3 Cost Summary Table

| Project Number | Project Title | Project Estimate Level (%) | Spend | Prior Yrs | Current Planning Horizon (\$M) | | | | | | Total |
|------------------------|------------------------|----------------------------|---------|-----------|--------------------------------|-------|------|------|------|--------|-------|
| | | | | | Yr 1 | Yr 2 | Yr 3 | Yr 4 | Yr 5 | Yr 6 + | |
| C046352 | VVO Pilot Distribution | Est Lvl (e.g. +/- 10%) | CapEx | 3.049 | 1.288 | 0.050 | - | - | - | - | 4.387 |
| | | | OpEx | 0.447 | 0.028 | - | - | - | - | 0.475 | |
| | | | Removal | 0.070 | 0.028 | - | - | - | - | 0.098 | |
| | | | Total | 3.566 | 1.344 | 0.050 | - | - | - | 4.960 | |
| C052708 | VVO Pilot Substation | Est Lvl (e.g. +/- 10%) | CapEx | 0.223 | 0.005 | - | - | - | - | - | 0.228 |
| | | | OpEx | - | - | - | - | - | - | - | |
| | | | Removal | - | - | - | - | - | - | - | |
| | | | Total | 0.223 | 0.005 | - | - | - | - | 0.228 | |
| C053111 | VVO Pilot IS | Est Lvl (e.g. +/- 10%) | CapEx | 1.012 | 0.210 | - | - | - | - | - | 1.222 |
| | | | OpEx | 0.177 | - | - | - | - | - | - | 0.177 |
| | | | Removal | 0.007 | - | - | - | - | - | - | 0.007 |
| | | | Total | 1.196 | 0.210 | - | - | - | - | 1.406 | |
| Total Project Sanction | | | CapEx | 4.284 | 1.503 | 0.050 | - | - | - | - | 5.837 |
| | | | OpEx | 0.624 | 0.028 | - | - | - | - | - | 0.652 |
| | | | Removal | 0.077 | 0.028 | - | - | - | - | - | 0.105 |
| | | | Total | 4.985 | 1.559 | 0.050 | - | - | - | 6.594 | |

*Note there is a recurring annual IS OpEx cost of \$0.289M starting in FY15 for maintaining Security, Network WAN components, Trilliant Wireless units, servers, hardware, and software licensing.



Short Form Sanction Paper

4.4 Project Budget Summary Table

Project Costs per Business Plan

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| | | Yr. 1 2016/17 | Yr. 2 2017/18 | Yr. 3 2018/19 | Yr. 4 2019/20 | Yr. 5 2020/21 | Yr. 6 + 2021/22 | |
| CapEx | 4.284 | 0.852 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 5.136 |
| OpEx | 0.624 | 0.075 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.699 |
| Removal | 0.077 | 0.098 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.175 |
| Total Cost in Bus. Plan | 4.985 | 1.025 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 6.010 |

Variance (Business Plan-Project Estimate)

| \$M | Prior Yrs (Actual) | Current Planning Horizon (\$M) | | | | | | Total |
|-------------------------|-----------------------|--------------------------------|------------------|------------------|------------------|------------------|--------------------|---------|
| | | Yr. 1 2016/17 | Yr. 2 2017/18 | Yr. 3 2018/19 | Yr. 4 2019/20 | Yr. 5 2020/21 | Yr. 6 + 2021/22 | |
| CapEx | 0.000 | (0.651) | (0.050) | 0.000 | 0.000 | 0.000 | 0.000 | (0.701) |
| OpEx | 0.000 | 0.047 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.047 |
| Removal | 0.000 | 0.070 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.070 |
| Total Cost in Bus. Plan | 0.000 | (0.534) | (0.050) | 0.000 | 0.000 | 0.000 | 0.000 | (0.584) |

5 Key Milestones

| Milestone | Target Date: (Month/Year) |
|--------------------------------------------------|------------------------------|
| Partial Sanction | 01/2014 |
| Construction Start | 07/2014 |
| Partial Sanction | 06/2015 |
| IS Construction and implementation Complete - CC | 09/2015 |
| Partial Sanction | 01/2016 |
| Final Engineering Complete | 05/2016 |
| Project Sanction | 07/2016 |
| Construction Complete | 04/2017 |
| Project Closure | 08/2017 |



Short Form Sanction Paper

6 Statements of Support

6.1.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Role | Individual | Responsibilities |
|-----------------------------|-------------------|---------------------------------------------------------------------------------------------|
| Investment Planner | DiConza, Glen | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Wyman, Anne | Endorses Resources, cost estimate, schedule, and Portfolio Alignment |
| Asset Management / Planning | Labarre, Alan T. | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Project Management | Schneller, Andrew | Endorses Resources, cost estimate, schedule |
| Electric Project Estimation | Simonds, Jammie | Endorses Costs Estimate |

6.1.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Reviewer List | Individual |
|--------------------------|--------------------|
| Finance (Dist) | Easterly, Patricia |
| Regulatory | Zschokke, Peter |
| Jurisdictional Delegates | Patterson, Jim |
| Control Center | Gallagher, Michael |
| Procurement | Curran, Art |

Short Form Sanction Paper



7 Decisions

I:

(a) APPROVE this paper and the investment of \$6.594M and a tolerance of +/- 10%

(b) NOTE that John Skrzypczak is the Project Manager and has the approved financial delegation.

Signature..........Date..........

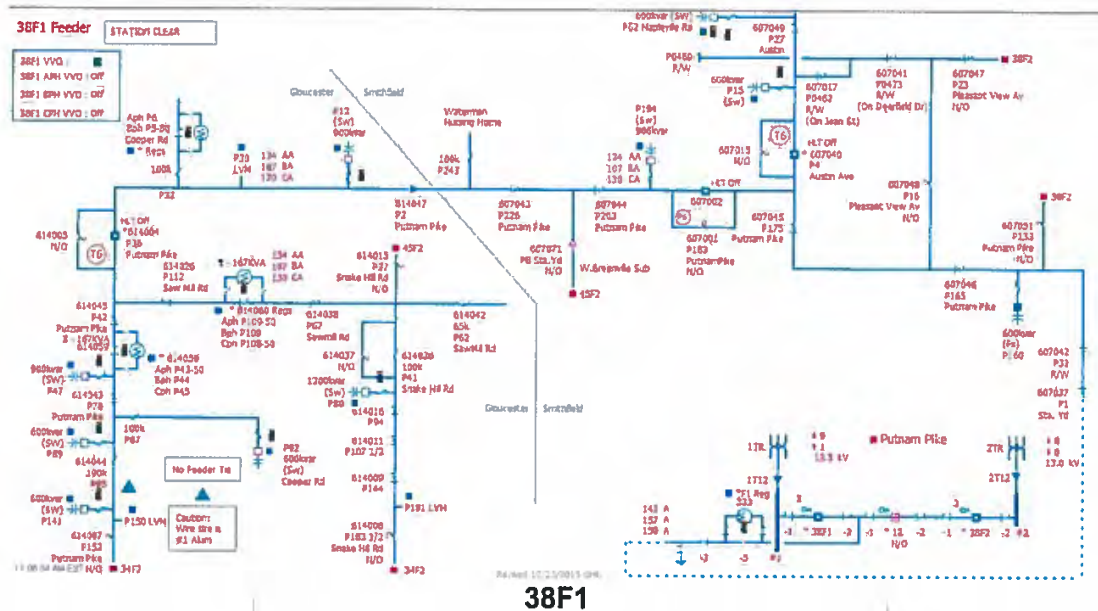
Executive Sponsor – Chris Kelly, Acting Senior Vice President, Electric Process and Engineering



Short Form Sanction Paper

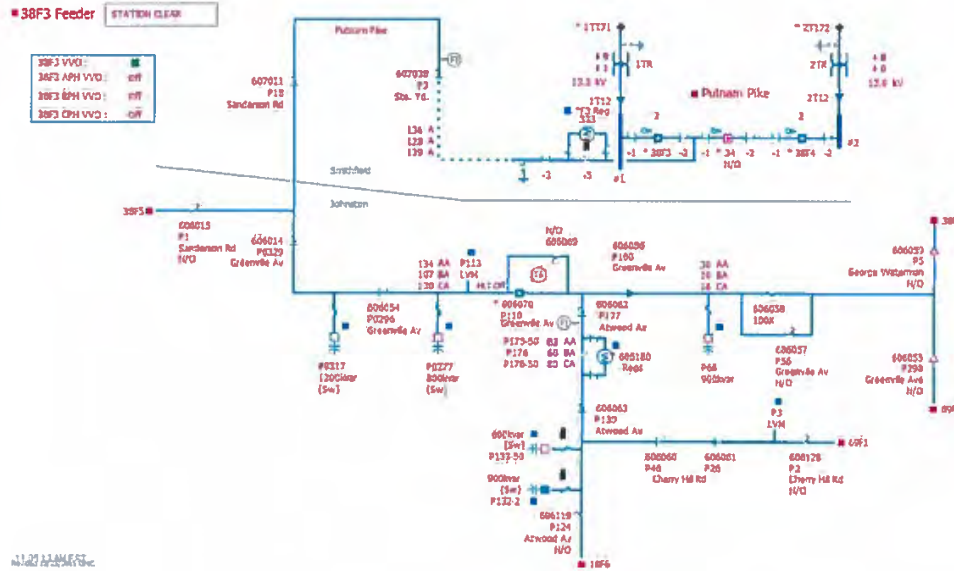
8 Other Appendices

8.1 Figures





Short Form Sanction Paper



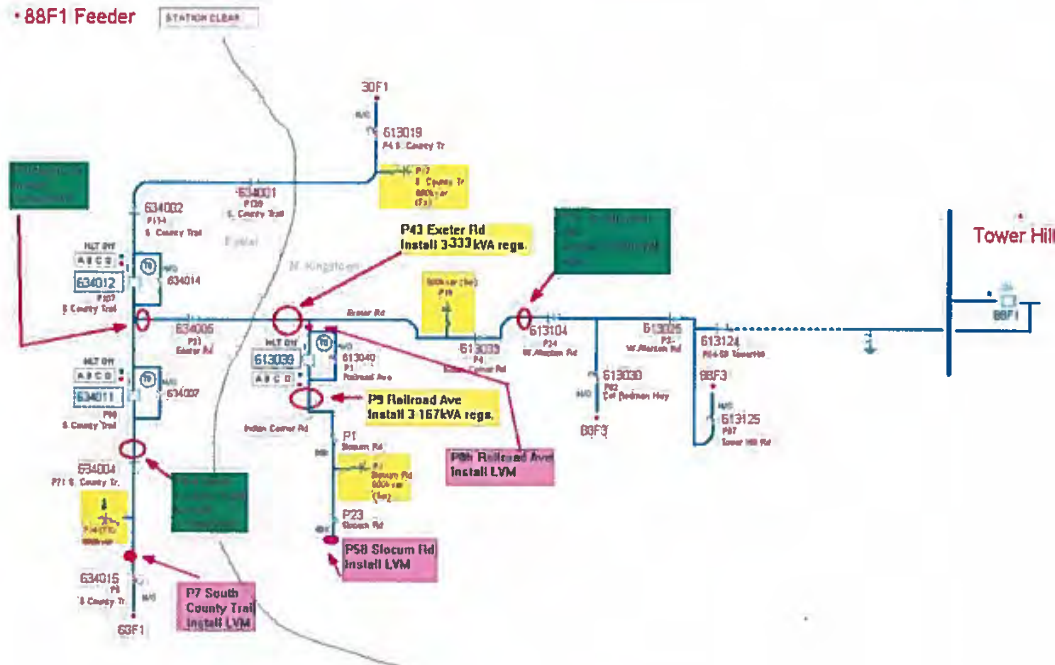
nationalgrid





Short Form Sanction Paper

• 88F1 Feeder

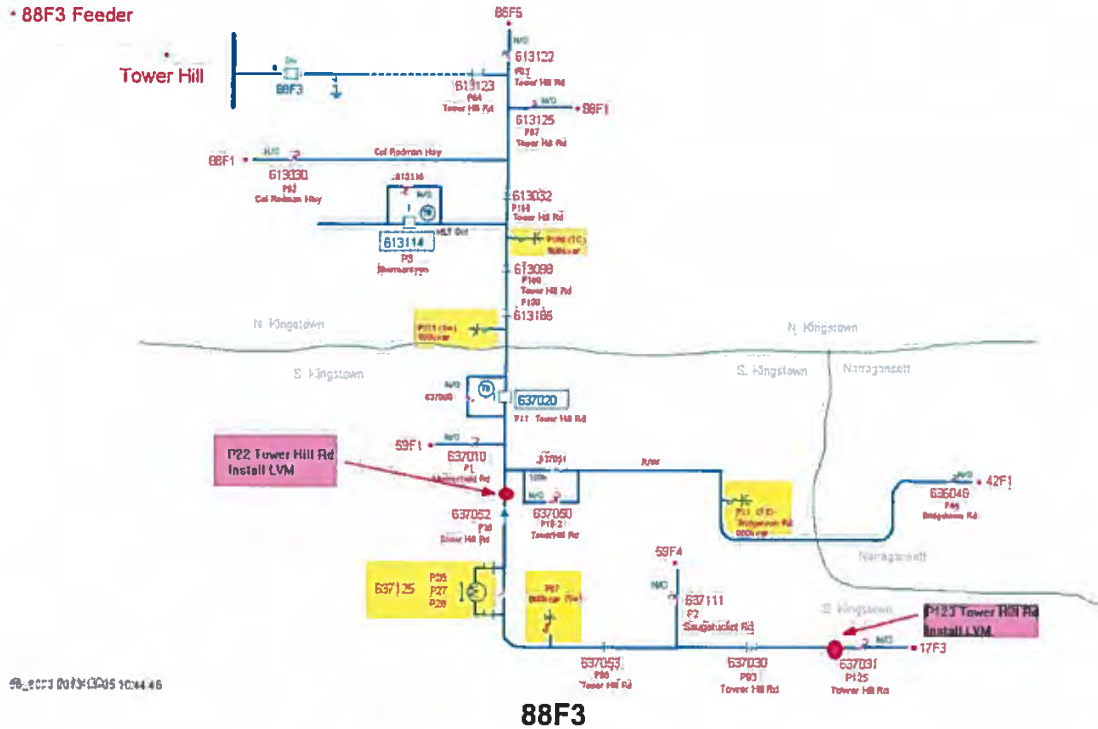


88F1



Short Form Sanction Paper

88F3 Feeder



88F3

08_0003 00000005 1004.46

nationalgrid

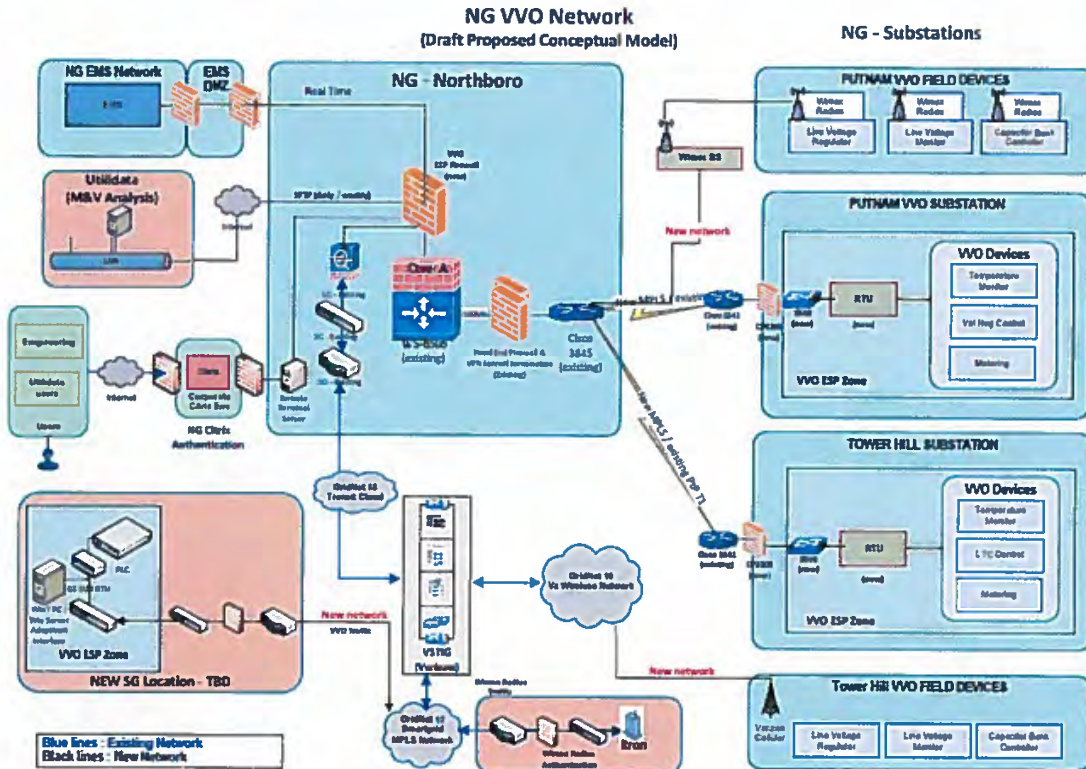


nationalgrid





Short Form Sanction Paper



C046386

BITS Wakefield Sub Upgrades (D-Sub)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046386</u> | USSC #: <u>USSC-13-007 v3</u> |
| Revision: <u>3</u> | Budget Version: <u>Default</u> |
| Project Title: <u>BITS Wakefield Sub Upgrades (D-Sub)</u> | |
| Project Description: Wakefield substation bay and protection upgrades due to BITS interconnection. | |

| | |
|-----------------------------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>in service</u> | |
| Responsible Person: <u>MAXIMOVICH, GEOR</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>Customer Request/Public Requirement</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Distributed Generation</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>49</u> | Project Complexity Score: <u>31</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------|--------------|----------------|--------------------|-----------------|-----------------|--------------------|------------|
| Est Start Date: <u>9/21/2012</u> | Est Complete Date: <u>7/31/2017</u> | | | | | | | | | | |
| Est In-Service Date: <u>3/31/2017</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$2,818,484</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$2,009,000</u></td> <td><u>\$22,000</u></td> <td><u>\$11,000</u></td> <td><u>\$2,042,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$2,009,000</u> | <u>\$22,000</u> | <u>\$11,000</u> | <u>\$2,042,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$2,009,000</u> | <u>\$22,000</u> | <u>\$11,000</u> | <u>\$2,042,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

This project is required to interconnect the Block Island Wind Farm to the Narragansett Electric 34.5kV distribution system, and will also facilitate interconnection of the Block Island Power Company (BIPCO) as a new load.

National Grid is contractually committed to interconnect Deepwater Wind's small-scale offshore wind demonstration project off the Block Island coast to the company's 34.5kV system in the mainland. While also advancing the State's policy intention to interconnect Block Island to the mainland, the BITS project serves a dual purpose of delivering the

Project Scope:

This project is for protection and substation bay upgrades at Wakefield substation. The scope of this work needs to be further developed.

Project Alternatives Considered:

Not Applicable

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|--------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>6/2/2016 08:33:06</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046386 Current Total Authorized Amount: \$2,04...

Title: BITS Wakefield Sub Upgrades (D-Sub)
Project Number: C046386

Budget Version Default [active]
Revision v3
Revision Status Approved
Revision No. 3
Est Start Date 09/21/2012
Est Complete Date 07/31/2017
Est In Srvc Date 03/31/2017
Capital \$2,009,000.00
Expense \$22,000.00
Jobbing \$0.00
Retirement \$0.00
Removal \$11,000.00
Total (excl. Rets.) \$2,042,000.00
Credits \$0.00
Net \$2,042,000.00

Revision Info Other Updates

Revision 3 of 3
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from WO
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close

This document has been reviewed for Critical Energy Infrastructure Information (CEII). 6/1/2016

D+T

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US Sanction Paper

| | | | |
|---------------------------|---------------------------------------------|--------------------------|------------------------------------------------------|
| Title: | Block Island Transmission System (BITS) | Sanction Paper #: | USSC-13-007v3 |
| Project #: | C044795, C044797, C044798, C046386, C059842 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 05/23/16 |
| Author: | George Maximovich | Sponsor: | Carol Sedewitz, Acting VP, Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | George Maximovich |

1 Executive Summary

1.1 Sanctioning Summary

This paper requests sanction of substation projects C044795, C044797, C046386, C059842 and of transmission line project C044798 in the amount \$133.877M with a tolerance of +/- 10% for the purposes of construction and full implementation.

This sanction amount is \$133.877M broken down into:
\$133.760M Capex
\$0.064M Opex
\$0.053M Removal

1.2 Project Summary

This project is required to interconnect the Block Island Wind Farm to the Narragansett Electric 34.5kV system, and to also interconnect the Block Island Power Company (BIPCO) as a new wholesale customer. The work includes two new 34.5kV substations, one on Block Island and one on the mainland; approximately 20 miles of 34.5kV submarine cable; approximately 4 miles of underground infrastructure in the town of Narragansett and Wakefield to interconnect the offshore wind farm with the existing 34.5kV Wakefield Substation; approximately 1 miles of combined overhead and underground infrastructure on Block Island; and reinforcements to the existing 34.5kV system to accommodate the proposed interconnection.

The Block Island Transmission System (BITS) project is a key component of the proposed 30MW Deepwater Wind offshore wind demonstration project, a project that will advance numerous important public policy goals of the State of Rhode Island. National Grid has publicly supported the demonstration project and has committed to move forward with the BITS project to further the State's public policy goals.



US Sanction Paper

1.3 Summary of Projects

| Project Number | Project Type (Elec only) | Project Title | Estimate Amount (\$M) |
|----------------|-----------------------------|----------------------------------------|--------------------------|
| C044795 | T-Sub | BITS Block Island Substation | 11.698 |
| C044797 | T-Sub | BITS Mainland Substation | 8.060 |
| C044798 | T-Line | BITS 34.5kV Line | 111.837 |
| C059842 | T-Sub | BITS West Kingston Protection Upgrades | 0.240 |
| C046386 | D-Sub | BITS Wakefield Sub Upgrade | 2.042 |
| Total | | | 133.877 |

1.4 Associated Projects

| Project Number | Project Title | Estimate Amount (\$M) |
|----------------|---------------|-----------------------|
| | | |
| | | |
| Total | | 0.000 |

1.5 Prior Sanctioning History

| Date | Governance Body | Sanctioned Amount | Potential Project Investment | Paper Title | Sanction Type | Tolerance |
|-------------------|-----------------|-------------------|------------------------------|-------------------------------------------------------|------------------|--------------|
| December 10, 2014 | USSC | \$85.500M | \$107.200M | USSC-13-007v2 Block Island Transmission System (BITS) | Partial Sanction | +/-25% |
| February 13, 2013 | USSC | \$8.000M | \$75.000M | USSC-13-007 Block Island Transmission System (BITS) | Partial Sanction | -25% to +50% |
| May 11, 2011 | DCIG | \$0.590M | \$48.578M | DCIG0411W381 Block Island Transmission System (BITS) | Partial Sanction | N/A |



US Sanction Paper

1.6 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| June 2017 | Project Closure Report |

1.7 Category

| Category | Reference to Mandate, Policy, NPV, or Other |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="radio"/> Mandatory <input checked="" type="radio"/> Policy- Driven <input type="radio"/> Justified NPV <input type="radio"/> Other | Rhode Island General Assembly enacted a law, R.I.G.L. Section 39-26.1-7, designed to facilitate the construction of a small-scale offshore wind demonstration project off the coast of Block Island, including an undersea transmission cable that interconnects Block Island to the mainland in order to further certain public policy goals |

1.8 Asset Management Risk Score

Asset Management Risk Score: 49

Primary Risk Score Driver: (Policy Driven Projects Only)

☐ Reliability
 ☒ Environment
 ☐ Health & Safety
 ☐ Not Policy Driven

1.9 Complexity Level

☒ High Complexity
 ☐ Medium Complexity
 ☐ Low Complexity
 ☐ N/A

Complexity Score: 31

1.10 Process Hazard Assessment

A Process Hazard Assessment (PHA) is required for this project:

☒ Yes
 ☐ No



US Sanction Paper

1.11 Business Plan

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (M\$) |
|--------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------|
| NE Transmission FY17-21 Capital Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | 18.539 |
| NE Distribution FY17-21 Capital Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input checked="" type="radio"/> Over <input type="radio"/> Under <input type="radio"/> NA | 1.196 |

1.12 If cost > approved Business Plan how will this be funded?

Re-allocation of funds within the portfolio will be managed by the Business Support Manager to meet jurisdictional budgetary, statutory and regulatory requirements

1.13 Transmission Current Planning Horizon

| \$M | Prior Yrs | Current Planning Horizon | | | | | | Total |
|--------------------|-----------|--------------------------|------------------|------------------|------------------|------------------|--------------------|---------|
| | | Yr. 1 2016/17 | Yr. 2 2017/18 | Yr. 3 2018/19 | Yr. 4 2019/20 | Yr. 5 2020/21 | Yr. 6 + 2021/22 | |
| CapEx | 57.726 | 74.006 | 0.019 | 0.000 | 0.000 | 0.000 | 0.000 | 131.751 |
| OpEx | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.042 |
| Removal | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.042 |
| CIAC/Reimbursement | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Total | 57.810 | 74.006 | 0.019 | 0.000 | 0.000 | 0.000 | 0.000 | 131.835 |



US Sanction Paper

1.14 Distribution Current Planning Horizon:

| \$M | Prior Yrs | Current Planning Horizon | | | | | | Total |
|--------------------|-----------|--------------------------|------------------|------------------|------------------|------------------|--------------------|-------|
| | | Yr. 1 2016/17 | Yr. 2 2017/18 | Yr. 3 2018/19 | Yr. 4 2019/20 | Yr. 5 2020/21 | Yr. 6 + 2021/22 | |
| CapEx | 0.297 | 1.711 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 2.009 |
| OpEx | 0.000 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 |
| Removal | 0.009 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 |
| CIAC/Reimbursement | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Total | 0.306 | 1.735 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 2.042 |

1.15 Key Milestones

| Milestone | Target Date: (Month/Year) |
|----------------------------------------------------------|---------------------------|
| Preliminary Engineering Complete | October 2014 |
| Planning Sanction | December 2014 |
| Engineering Design Complete - EDC - Line | December 2015 |
| Construction Start - Line | January 2016 |
| Construction Start – Substation Site Preparation | January 2016 |
| Engineering Design Complete – EDC - Substation | June 2016 |
| Project Sanction | May 2016 |
| Construction Start – BIPCO Connection | October 2016 |
| Construction Finish – Block Island Wind Farm Connection | October 2016 |
| Ready for Load – RFL - Block Island Wind Farm Connection | November 2016 |
| Construction Finish – BIPCO Connection | February 2017 |
| Ready for Load – RFL - BIPCO Connection | March 2017 |
| Project Closure Report | July 2017 |



US Sanction Paper

1.16 Resources, Operations and Procurement

| Resource Sourcing | | | |
|--------------------------------------------------------|----------------------------------------------|------------------------------------------------|----------------------------------------|
| Engineering & Design Resources to be provided | <input checked="" type="checkbox"/> Internal | <input checked="" type="checkbox"/> Contractor | |
| Construction/Implementation Resources to be provided | <input checked="" type="checkbox"/> Internal | <input checked="" type="checkbox"/> Contractor | |
| Resource Delivery | | | |
| Availability of internal resources to deliver project: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |
| Availability of external resources to deliver project: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |
| Operational Impact | | | |
| Outage impact on network system: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |
| Procurement Impact | | | |
| Procurement impact on network system: | <input type="radio"/> Red | <input type="radio"/> Amber | <input checked="" type="radio"/> Green |

1.17 Key Issues (include mitigation of Red or Amber Resources)

| | |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | The BITS project will install approximately 20 miles of submarine cable and associated facilities between Narragansett Electric and Block Island. |
| 2 | Permitting, environmental, and acquisition of property rights risks were led by the developer, Deepwater Wind Block Island, LLC, or its affiliate. |
| 3 | National Grid purchased the work Deepwater completed by January 2015 on the project. The conceptual engineering, property rights, and permits were used as the starting point for the construction of the project. |

1.18 Climate Change

| | | | |
|----------------------------------------------------------------------|------------------------------------------|--------------------------------|--------------------------------|
| Contribution to National Grid's 2050 80% emissions reduction target: | <input checked="" type="radio"/> Neutral | <input type="radio"/> Positive | <input type="radio"/> Negative |
| Impact on adaptability of network for future climate change: | <input checked="" type="radio"/> Neutral | <input type="radio"/> Positive | <input type="radio"/> Negative |



US Sanction Paper

1.19 *List References*

| | |
|---|------------------------------------------------------------------------|
| 1 | Subtransmission Impact Study, May 2016 |
| 2 | System Impact Study, Queue Position #405, April 2014 |
| 3 | Large Generator Interconnection Request for Block Island, October 2012 |
| 4 | System Impact Study, Queue Position #308, July 2011 |

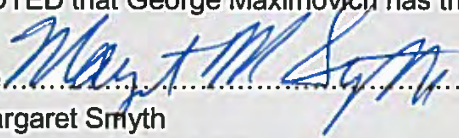

US Sanction Paper



2 Decisions

The US Sanctioning Committee (USSC) at a meeting held on May 23, 2016:

- (a) APPROVED this paper and the investment of \$133.877M and a tolerance of +/- 10.
- (b) NOTED that George Maximovich has the approved financial delegation.

Signature  Date 
Margaret Smyth
US Chief Financial Officer
Chair, Senior Executive Sanctioning Committee



US Sanction Paper

3 Sanction Paper Detail

| | | | |
|---------------------------|---------------------------------------------|--------------------------|---------------------------------------------------------------|
| Title: | Block Island Transmission System (BITS) | Sanction Paper #: | USSC-13-007v3 |
| Project #: | C044795, C044797, C044798, C046386, C059842 | Sanction Type: | Sanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 05/23/16 |
| Author: | George Maximovich | Sponsor: | Carol Sedewitz, Acting VP, Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | George Maximovich |

3.1 Background

In 2010, the Rhode Island General Assembly enacted a law, R.I.G.L. Section 39-26.1-7, designed to facilitate the construction of a small-scale offshore wind demonstration project off the coast of Block Island, including an undersea transmission cable that interconnects Block Island to the mainland in order to further certain public policy goals.

The statute authorized National Grid to enter into a power purchase agreement (PPA) with the state's preferred developer of offshore wind for the purchase of energy, capacity, and any other environmental and market attributes. National Grid and Deepwater Wind Block Island LLC entered into the PPA as of June 30, 2010 to purchase the output of power generated from the wind farm. The Rhode Island Public Utilities Commission (Commission) approved the PPA on August 16, 2010. The BITS project will facilitate delivery of the demonstration project's output into the Narragansett Electric service territory.

The statute also required that a transmission cable between Block Island and the mainland must be constructed. National Grid reserved the option to own or operate or otherwise participate in such transmission cable project. The PPA contemplated that the parties would negotiate a cable purchase agreement for Deepwater's construction of the BITS project and National Grid's subsequent purchase thereof.

Initially, National Grid moved forward with the BITS project on the premise that Deepwater Wind would construct the BITS project and National Grid would purchase it from Deepwater. Deepwater proceeded with initial conceptual design and permitting at their risk.



US Sanction Paper

National Grid and Deepwater Wind identified numerous principled discrepancies when negotiating an agreement to purchase the completed BITS project and the negotiations stalled. In an effort to move the project forward both parties agreed to change the project development strategy and investigate National Grid moving forward to construct the BITS project. National Grid completed negotiations with Deepwater Wind to purchase the conceptual engineering, permits, real estate rights and other work (collectively, the "Assets"). The conceptual engineering, property rights, and permits will be used as the starting point for the construction of the project. The transfer of the Assets has been agreed in the Transmission Facilities Purchase Agreement for a cost of \$9.48M. The Transmission Facilities Purchase Agreement was approved by the Rhode Island Division of Public Utilities and Carriers on April 2, 2014 and officially closed with Deepwater Wind on January 31, 2015.

3.2 Drivers

National Grid is contractually committed to proceed with negotiations with Deepwater Wind regarding the BITS project to facilitate the construction of Deepwater Wind's small-scale offshore wind demonstration project off the Block Island coast that includes an undersea transmission cable that interconnects Block Island to the mainland. While also advancing the State's policy intention to interconnect Block Island to the mainland, the BITS project serves a dual purpose of delivering the wind farm's power to the mainland and providing transmission service to Block Island Power Company (BIPCO).

3.3 Project Description

This project is required to interconnect the Block Island Wind Farm to the Narragansett 34.5kV system, and will also interconnect the Block Island Power Company (BIPCO) as a new load (see Appendix A for a geographical map and preliminary electrical one-line of the proposed system). This work includes:

- Two new 34.5kV substations. One on Block Island and one on the Mainland.
- Approximately 20 miles of 34.5kV submarine cable. The transition from the ocean onto the land will occur at Scarborough Beach in Narragansett and in Crescent Beach in Block Island. The cable will be installed beneath the beaches by horizontal directional drills (HDDs).
- Approximately 4 miles of underground infrastructure in Narragansett to interconnect wind farm with the existing 34.5kV system.
- Approximately 1 mile of combined overhead and underground infrastructure on Block Island.

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- A fiber optic cable running from the mainland to Block Island required for the protection system.

In addition to infrastructure required for the interconnection, National Grid has identified infrastructure upgrades to the existing Narragansett Electric 34.5kV system required as a result of the interconnection. These upgrades include:

- Installing two (2) 1.5 MVar shunt reactors at Block Island and two (2) 3.5 MVar shunt reactors at the new substation on the mainland.
- Upgrading a substation bay at Wakefield substation for interconnection purposes. It includes new relays to support the interconnection.
- Modify at West Kingston substation the existing power directional relaying to allow for bi-directional power flow and also to detect faults on the transmission system and isolate the wind farm.

The installation of shunt reactors at Block Island will compensate for the reactive charging current produced by the wind farm collector system and undersea cable to Block Island. The installation of shunt reactors on the mainland substation will compensate for the reactive charging current produced by the approximately 20 mile undersea cable from Block Island to the mainland. Separate stages of shunt reactors will provide the flexibility to maintain acceptable voltage on Block Island and the mainland.

3.4 Benefits Summary

The project furthers the public policy goals articulated in the statute, which National Grid supports. Those public policy goals are: to position the State of Rhode Island to take advantage of the economic development benefits of the emerging offshore wind industry; promote the development of renewable energy sources that increase the nation's energy independence from foreign sources of fossil fuels; reduce the adverse environmental and health impacts of traditional fossil fuel energy sources; and provide the Town of New Shoreham with an electrical connection to the mainland.¹ The statute also includes provisions addressing recovery of project costs as described in Section 3.10.1.

3.5 Business and Customer Issues

The statute includes provisions that address recovery of project costs as described in Section 3.10.1.

¹ See R.I.G.L. § 39-26.1-7(a).



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The project cost is over the existing FY17 –FY21 Business Plan as a result of the following variance:

- Change order on the EPC contract for the submarine cable work in the amount of \$16.626M. Contractor submitted request of compensation for the additional work required to construct the horizontal directional drill (HDD) at Scarborough Beach based on encountered surface rock conditions and additional burial depth required to mitigate inadvertent return of drilling fluid. Currently under resolution process.
- Compensation to the Black Point Fish Trap owner in the amount of \$1.400M. The commercial operation is not feasible on this area to maintain the integrity and safety of the submarine cable.
- The project estimate cost on engineering works, legal, permitting and construction supervision activities resulted in increases of \$2.600M. The planning estimate underestimated the level of effort on these areas for the continuation of the project and the effect of the incremental cost related to the activities at Block Island.
- Archaeological discoveries at Block Island will impose changes on construction methodology for underground infrastructure in order proceed with data recovery of archeological artifacts and will be necessary to install a temporary overhead line to mitigate the schedule delays expected on the completion of the underground infrastructure. It is estimated an increase of \$1.800M. Currently under resolution process.
- The market value of substation equipment is \$1.960M over the planning grade estimate for these items.
- Concentration of contaminated soil in excess of the applicable RIDEM limits identified at Wakefield substation will impose remediation and additional construction activities. It is estimated an increase of \$0.200M. Currently under resolution process.

3.6 Alternatives

Per the statute, "The electric distribution company, at its option, may elect to own, operate, or otherwise participate in such transmission cable project. The electric distribution company, however, has the option to decline to own, operate, or otherwise participate in the transmission cable project."²

With respect to the transmission cable project (BITS), the option considered was:

Option 1: Deepwater Wind constructs the project and National Grid purchases the project from Deepwater Wind. This option is not recommended because the developer's proposal considered a Cost Plus/Cost-Reimbursable arrangement to construct the project that would be difficult to justify to our regulators, would transfer all

² See R.I.G.L. §39-26.1-7(c).



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cost risk to National Grid and our customers, and would result in a potentially higher overall project cost.

3.7 *Safety, Environmental and Project Planning Issues*

As discussed with the developer, the developer has the responsibility for maintaining a suitable safety program, environmental compliance and securing all permits associated with the BITS project.

Based on the completed negotiation process, National Grid purchased and transferred from Deepwater Wind their initial conceptual design and the permitting associated with the BITS project.

The BITS project will facilitate the purchase of renewable energy and/or capacity and environmental attributes per the terms of the Power Purchase Agreement for the Block Island Wind Farm.

A health and safety plan has been developed for all project areas and all National Grid safety and environmental rules will be followed. During the development of the HDD, consideration was given to the Process Hazard Analysis (PHA).

The project was planned with multiple resources. A number of departments are using external resources. The external work will be executed via contracts for both time and material (labor), fixed price (material). Coordination of resource planning and workforce/contractor delivery strategy was implemented and will be coordinated throughout.



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3.8 Execution Risk Appraisal

| Number | Detailed Description of Risk / Opportunity | Probability | Impact | | Score | | Strategy | Pre-Trigger Mitigation Plan | Residual Risk | Post Trigger Mitigation Plan |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------|----------|-------|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------|
| | | | Cost | Schedule | Cost | Schedule | | | | |
| 1 | Permitting completed by Developer was initiated with conceptual engineering documentation. It is required to obtain their financial support. Amendments on permits are possible when final engineering is completed. | 3 | 4 | 4 | 12 | 12 | Mitigate | National Grid Legal, Real Estate and Engineering participate on documentation review and updates to mitigate future actions and requirements | Variances during final engineering | Accept |
| 2 | Material Cost Increase caused by copper price | 3 | 3 | 1 | 9 | | Mitigate | Start early process to get competitive bids for major material (34.5kV submarine cable) | Minimal | Accept |
| 3 | Construction execution is tight to approved working windows established on permits. These restrictions can affect RFL date if a milestone is not achieved on the approved period of time. | 2 | 3 | 4 | 6 | 8 | Mitigate | Develop comprehensive and detailed construction sequence. Communicate with construction personnel to ensure milestones are achieved in a timely fashion. | Minimal | Work overtime or add additional resources to achieve the targets |
| 4 | Customer Outreach Plan was initiated by Developer as part of their permitting process. Main focus was to obtain the required permits for the project. The approach was different to National Grid's commitment to the local communities and customers. | 3 | 3 | 2 | 9 | 6 | Mitigate | National Grid has implemented a multi-faceted pre-, during-, and post-construction outreach and public relations campaign. | Minimal | Accept |
| 5 | Geological, archaeological and environmental investigations were completed by the developer as part of permitting process. Variance to the results can have significant impact on project execution and cost. | 3 | 4 | 4 | 12 | 12 | Mitigate | National Grid Legal, Permitting and Engineering participate on documentation review and updates to mitigate future actions and requirements. | Variances during construction | Accept |
| 6 | Inverter technology considered on the Wind Turbines requires detailed simulation to assess the impact of this technology on the performance and reliability of the system and underlying interconnection facilities. | 4 | 3 | 3 | 12 | 12 | Mitigate | National Grid Engineering performed Subtransmission Impact Study with Wind Turbine PSCAD model. | Minimal | Accept |



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3.9 Permitting

| CONSTRUCTION PERMITS | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Federal Permits | Regulatory Authorities |
| Right-of-Way Grant for cable in Federal Waters (30 CFR Part 285) | Minerals Management Service |
| Individual Permit (Section 10 of the Rivers and Harbors Act; Section 404 of the Clean Water Act) | United States Army Corps of Engineers (USACE) |
| NEPA Review | USACE (Lead Federal Agency); Council on Environmental Quality |
| Essential Fish Habitat Consultation (Magnuson-Stevens Act); Threatened and Endangered Species Consultation (Section 7 of the Endangered Species Act); Incidental Harassment Authorization (Marine Mammals Protection Act) | National Marine Fisheries Service (NMFS) |
| Threatened and Endangered Species Consultation (Section 7 of the ESA) | United States Fish and Wildlife Service (USFWS) |
| Cultural Resources (Section 106 of the National Historic Preservation Act) | USACE and Rhode Island Historical Preservation and Heritage Commission |
| Determination of no hazard to vessel traffic and Approval for private aid to navigation | United States Coast Guard (USCG) |
| Conformity Determination/Air Emissions Permit (40 CFR Part 55) and General Stormwater Permit (Section 309 of the Clean Water Act) | United States Environmental Protection Agency (USEPA) |
| Notice of Proposed Construction or Alteration | Federal Aviation Administration (FAA) |
| State Permits | Regulatory Authorities |
| State Assent | Rhode Island Coastal Resources Management Council (CRMC) |
| Marine Dredging Permit | CRMC |
| Coastal Consistency Determination | CRMC |
| Lease/License of Offshore Land | CRMC |
| Coastal and Freshwater Wetlands Permit | CRMC |
| Determination of Consistency with WQM Plan | CRMC |
| Section 106 (NHPA) Consultation | USACE and Rhode Island Historical Preservation and Heritage Commission |



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| | |
|------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Utility Permit for cable installation | Rhode Island Department of Transportation (RIDOT) |
| RIPDES Construction Storm Water General Permit | RIDEM |
| Municipal Permits | Regulatory Authorities |
| Storm water Pollution Prevention Plan Approval | Municipal departments and agencies in New Shoreham, Wakefield, Narragansett, and South Kingstown |
| Temporary Dewatering Permit | |
| Municipal Engineering Approval | |
| Tree Removal Approval | |
| Temporary Fencing Approval | |
| Local Site Plan Approval | |
| Zoning Certificates or Variances | |
| Engineering Release | |
| Construction Permits | |

3.10 Investment Recovery

3.10.1 Investment Recovery and Regulatory Implications

Pursuant to R.I.G.L. §39-26.1-7(f), the Rhode Island Division of Public Utilities and Carriers, on April 2, 2014, has provided its written consent to the Purchase Agreement for the Assets. Narragansett Electric and New England Power Company (NEP) are authorized, and have made a filing with FERC to put into effect transmission rates to recover all costs associated with the purchase of the Assets, construction of the transmission cable and related facilities, and the annual O&M. On September 2, 2014 FERC approved all four agreements required to implement cost recovery for the project. An ancillary benefit of the cable project with Deepwater is that BIPCO will become a transmission customer of NEP and will receive transmission service over the transmission facilities pursuant to a Local Network Service Agreement between BIPCO, NEP, and ISO-NE. The Local Network Services agreement will also allocate the costs of the transmission facilities between Narragansett Electric customers and BIPCO customers such that a small capped portion of the costs will be allocated to BIPCO as set forth in the statute and further described below. The annual cost-recovery



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mechanism for the BITS project will be through a fully reconciling rate adjustment from customers of Narragansett and/or BIPCO.

In addition, the statute authorizes Narragansett Electric to recover annually in electric distribution rates all costs incurred in the negotiation, administration, enforcement, transmission engineering associated with the design of the cable, and implementation of the project. In Docket No. 4308, the Commission approved Narragansett Electric's revised Transmission Service Cost Adjustment Provision (TSCAP), R.I.P.U.C. No. 2080, which established a clear recovery mechanism to recover all costs associated with the BITS project pursuant to subsection 7(f) of the statute.³ In the event that FERC disallows cost-recovery for BITS and/or the cost allocation with BIPCO, and/or the BITS project is not built, or Narragansett Electric elects not to own the cable, Narragansett Electric is authorized to make a filing with the Commission to recover the engineering and design costs incurred prior to abandonment under either the TSCAP, or the new and separate Long-Term Contracting for Renewable Energy Recovery Provision (LTCRER).⁴

3.10.2 Customer Impact

R.I.G.L. §39-26.1-7(f) provides that the cost allocation between Narragansett Electric customers and BIPCO customers for the transmission cable is structured so that the estimated impact on the typical residential customer bill for such transmission costs for customers in the Town of New Shoreham is higher than the estimated impact on the typical residential customer bill for Narragansett Electric customers. The formula for developing this higher charge for the customers in the Town of New Shoreham will be to allocate the actual cable costs based on the annual peak demands of BIPCO and Narragansett Electric, and to recover the resultant costs in the per kWh charges of each company; provided, that the difference in the individual charge per kWh or per customer/month is capped at a ratio of average demand to peak demand for BIPCO relative to Narragansett Electric of 1.8 to 1.0.

The statute further requires that the revenue requirement for the annual cable costs be calculated in the same manner that the revenue requirement is calculated for other transmission facilities in Rhode Island for local network service under FERC's jurisdiction. This project results in an indicative first full year revenue requirement when the asset is placed in service equal to approximately \$23.261M. This is indicative only. The actual revenue requirement will differ depending upon the timing of the next rate case and/or the timing of the next filing in which the project is included in rate base.

³ Because the preliminary engineering and design costs incurred to date are likely to be capitalized and included in the determination of the annual revenue requirement, and will continue to be incurred as the project progresses, Narragansett deferred recovery of these costs in Docket No. 4308 until such time as it has received FERC approval to begin billing the costs through transmission service rates. See Report and Order, Docket No. 4308 (May 3, 2012).

⁴ The LTCRER was approved by the Commission in Docket No. 4308 in conjunction with the amended TSCAP. See Report and Order, at 6.



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3.10.3 CIAC / Reimbursement

None

3.11 Financial Impact to National Grid

3.11.1 Transmission Cost Summary Table

| Project Number | Project Title | Project Estimate Level (%) | Spend (\$M) | Prior Yrs | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | Total |
|------------------------|----------------------------------------|----------------------------|-------------|-----------|---------|---------|---------|---------|---------|---------|--------|
| | | | | | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | |
| C044795 | BITS Block Island Substation | +/- 10% | CapEx | 3.399 | 8.268 | 0.004 | 0.000 | 0.000 | 0.000 | 0.000 | 11.671 |
| | | | OpEx | 0.020 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.020 | |
| | | | Removal | 0.007 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.007 | |
| | | | Total | 3.426 | 8.268 | 0.004 | 0.000 | 0.000 | 0.000 | 11.698 | |
| C044797 | BITS Mainland Substation | +/- 10% | CapEx | 3.595 | 4.425 | 0.004 | 0.000 | 0.000 | 0.000 | 8.024 | |
| | | | OpEx | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 | |
| | | | Removal | 0.035 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.035 | |
| | | | Total | 3.631 | 4.425 | 0.004 | 0.000 | 0.000 | 0.000 | 8.060 | |
| C044798 | BITS 34.5kV Line | +/- 10% | CapEx | 50.645 | 61.161 | 0.010 | 0.000 | 0.000 | 0.000 | 111.816 | |
| | | | OpEx | 0.021 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.021 | |
| | | | Removal | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | | | Total | 50.666 | 61.161 | 0.010 | 0.000 | 0.000 | 0.000 | 111.837 | |
| C059842 | BITS West Kingston Protection Upgrades | +/- 10% | CapEx | 0.087 | 0.152 | 0.001 | 0.000 | 0.000 | 0.000 | 0.240 | |
| | | | OpEx | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | | | Removal | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| | | | Total | 0.087 | 0.152 | 0.001 | 0.000 | 0.000 | 0.000 | 0.240 | |
| Total Project Sanction | | | CapEx | 57.726 | 74.006 | 0.019 | 0.000 | 0.000 | 0.000 | 131.751 | |
| | | | OpEx | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.042 | |
| | | | Removal | 0.042 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.042 | |
| | | | Total | 57.810 | 74.006 | 0.019 | 0.000 | 0.000 | 0.000 | 131.835 | |

3.11.2 Transmission Project Budget Summary Table

Project Costs per Business Plan

| | | Current Planning Horizon | | | | | | |
|-------------------------|--------|--------------------------|---------|---------|---------|---------|---------|---------|
| | | Prior Yrs (Actual) | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + |
| \$M | | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
| CapEx | 57.726 | 55.482 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 113.208 |
| OpEx | 0.042 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.044 |
| Removal | 0.042 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.043 |
| Total Cost in Bus. Plan | 57.810 | 55.486 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 113.296 |

Variance (Business Plan-Project Estimate)

| | | Current Planning Horizon | | | | | | |
|-------------------------|-------|--------------------------|---------|---------|---------|---------|---------|----------|
| | | Prior Yrs (Actual) | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + |
| \$M | | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
| CapEx | 0.000 | (18.524) | (0.019) | 0.000 | 0.000 | 0.000 | 0.000 | (18.543) |
| OpEx | 0.000 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.002 |
| Removal | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.001 |
| Total Cost in Bus. Plan | 0.000 | (18.520) | (0.019) | 0.000 | 0.000 | 0.000 | 0.000 | (18.539) |



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3.11.3 Distribution Cost Summary Table

| Project Number | Project Title | Project Estimate Level (%) | Spend (\$M) | Prior Yrs | Current Planning Horizon | | | | | | Total |
|------------------------|----------------------------|----------------------------|-------------|-----------|--------------------------|-------|-------|-------|-------|---------|-------|
| | | | | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| C046386 | BITS Wakefield Sub Upgrade | +/- 10% | CapEx | 0.297 | 1.711 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 2.009 |
| | | | OpEx | 0.000 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 | |
| | | | Removal | 0.009 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 | |
| | | | Total | 0.306 | 1.735 | 0.001 | 0.000 | 0.000 | 0.000 | 2.042 | |
| Total Project Sanction | | | CapEx | 0.297 | 1.711 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 2.009 |
| | | | OpEx | 0.000 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.022 |
| | | | Removal | 0.009 | 0.002 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.011 |
| | | | Total | 0.306 | 1.735 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 2.042 |

3.11.4 Distribution Project Budget Summary Table

Project Costs per Business Plan

| \$M | Prior Yrs (Actual) | Current Planning Horizon | | | | | | Total |
|-------------------------|--------------------|--------------------------|-------|-------|-------|-------|---------|-------|
| | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| CapEx | 0.297 | 0.519 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.816 |
| OpEx | 0.000 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.010 |
| Removal | 0.009 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.019 |
| Total Cost in Bus. Plan | 0.306 | 0.540 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.846 |

Variance (Business Plan-Project Estimate)

| \$M | Prior Yrs (Actual) | Current Planning Horizon | | | | | | Total |
|-------------------------|--------------------|--------------------------|---------|-------|-------|-------|---------|---------|
| | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| CapEx | 0.000 | (1.192) | (0.001) | 0.000 | 0.000 | 0.000 | 0.000 | (1.193) |
| OpEx | 0.000 | (0.012) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | (0.012) |
| Removal | 0.000 | 0.009 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.009 |
| Total Cost in Bus. Plan | 0.000 | (1.195) | (0.001) | 0.000 | 0.000 | 0.000 | 0.000 | (1.196) |

3.11.5 Cost Assumptions

The accuracy level of estimate for each project is identified in table 3.11.1 and table 3.11.3.

The project estimate considers \$9.480M for the commercial negotiation closure with Deepwater Wind to purchase the conceptual engineering, permits, real estate rights and other work Deepwater Wind has completed to date on the project.

The project estimate considers \$47.970M for an EPC contract for the purpose of construction and full implementation for submarine cable work.



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The project estimate considers \$12.587M for a construction contract for the purpose of construction and full implementation for the underground infrastructure on mainland and Block Island for land cable work.

The project estimate considers \$5.068M for a construction contract for the purpose of construction and full implementation for the substation works on mainland and Block Island.

Standard material procurement process to be followed, and there are no expected delivery delays.

3.11.6 Net Present Value / Cost Benefit Analysis

Not financially driven.

3.11.7 Additional Impacts

No additional impacts are anticipated from this project.

3.12 Statements of Support

3.12.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------|
| Investment Planner - New England- Distribution | Glen DiConza | Endorses relative to 5-year business plan |
| Investment Planner - New England- Transmission | Michelle Park | Endorses relative to 5-year business plan |
| Resource Planning - Transmission. Line and Substation | Mark Phillips | Endorses Resources, cost estimate, schedule, and Portfolio Alignment |
| Transmission Asset Management/ Planning | Kasia Kulbacka | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Distribution Asset Management/ Planning | Alan Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design - Substation | Suzan Martuscello | Endorses scope, design, conformance with design standards |



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| | | |
|--------------------------------------------------|-----------------|-----------------------------------------------------------|
| Transmission Engineering | Lisa Sasur | Endorses scope, design, conformance with design standards |
| Engineering and Design - Protections and Telecom | Leonard Swanson | Endorses scope, design, conformance with design standards |
| Project Management | Sonny Anand | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Jammie Simonds | Endorses Cost Estimate |

3.12.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|--------------------------|-----------------------------------|
| Finance | Patricia Easterly Richard Helm |
| Regulatory | Peter Zschokke |
| Procurement | Art Curran |
| Jurisdictional Delegates | Jim Patterson Terron Hill |
| Control Centers (CC) | Will Houston / Michael Gallagher |

4 Appendices

4.1 Sanction Request Breakdown by Project

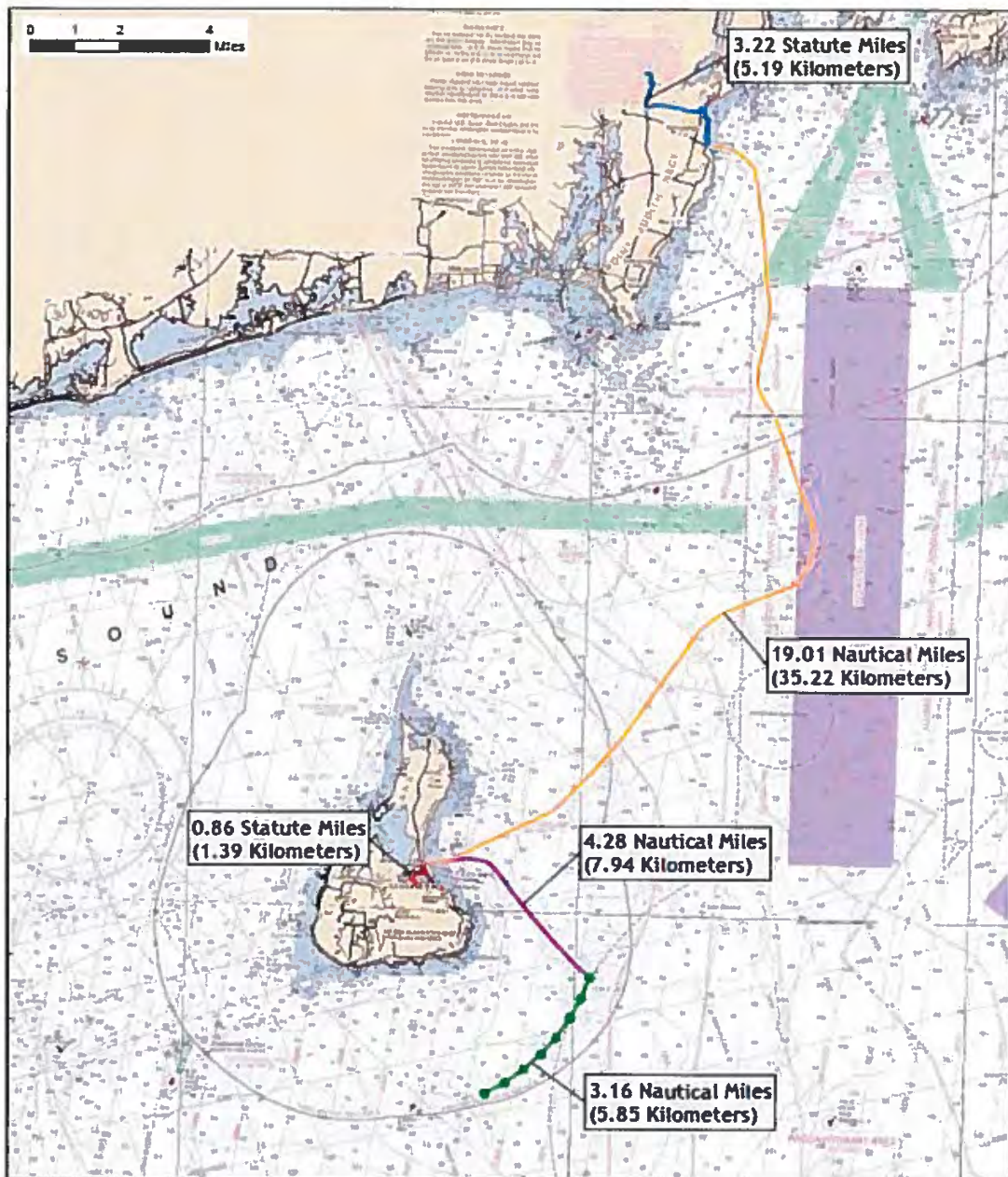
N/A

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4.2 Other Appendices

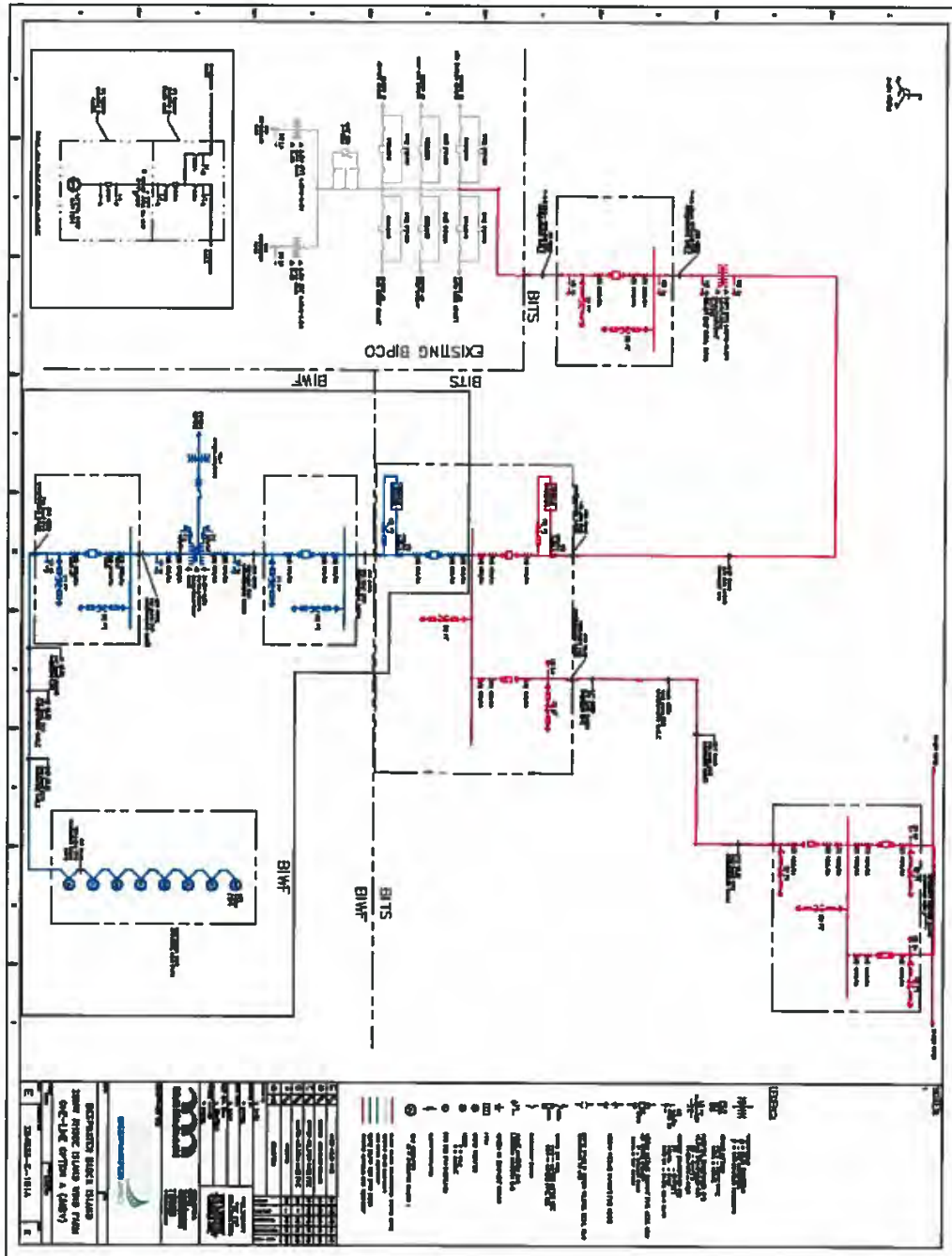
Appendix A.1: Geographical Map of Proposed System



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nationalgrid

Appendix A.2: Preliminary One Line Diagram of Proposed System



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4.3 NPV Summary

4.4 Customer Outreach Plan

Because of the complexities of the project, construction impacts, historical nature of Deepwater Wind's public facing efforts and National Grid's commitment to the local communities and customers, National Grid has implemented a multi-faceted pre-, during-, and post-construction outreach and public relations campaign. The goal of the plan is to position National Grid as an experienced and trusted partner in delivering an important and ground-breaking project with a focus on ensuring our local relationships are preserved beyond the life of the project. Local contracting support through an existing public outreach vendor, the RDW Group, was secured to assist in this effort. Public outreach was launched in May 2015 and continues to push proactive communications with all levels of stakeholders, including public and elected officials, local residents and businesses, fisheries community, etc. Through an interactive website, Twitter account, webinar, public open houses, town meetings, mapping and visuals, advertisements, stakeholder and media briefings, media and special events, door-to-door canvassing, electronic and static signage, and direct mailing, the outreach team provides regular updates and collects feedback to improve the public project outcomes. Outreach efforts are anticipated to conclude at the end of the 2016 calendar year.

C046397

Fdr 1109A - Install Cable Dorrance

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C046397</u> Revision: <u>3</u> Project Title: <u>Fdr 1109A - Install Cable Dorrance</u> Project Description: Feeder 1109 out of Dyer Street substation in Providence is one of eight feeders supplying the downtown Providence AC network. This project covers expenditures necessary to replace aged paper-lead cable in a limited area on the "A" portion of the feeder as part of the underground cable replacement initiative. | USSC #: Budget Version: <u>Default</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Status: <u>open</u> Responsible Person: <u>MOKEY, MICHAEL</u> Spending Rationale: <u>Asset Condition</u> Budget Class: <u>Asset Replacement</u> Capital by Category: Program Code: Project Risk Score: <u>36</u> | Initiator: <u>Holden, Eric H</u> Funding Type: <u>P Electric Distribution Line RI</u> Project Complexity Score: <u>14</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

Project Schedule / Expenditures

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Revision Status: <u>Approved</u> Est Start Date: <u>9/19/2012</u> Est In-Service Date: <u>3/31/2014</u> TTD Actuals: <u>\$397,351</u> | Est Complete Date: <u>3/31/2015</u> As Of: <u>10/2/2017</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|

| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
|----------------|----------------|----------------|----------------|--------------|----------------|
| | \$445,000 | \$0 | \$25,000 | \$470,000 | \$0 |

Justification / Risk Identification:

This project proactively replaces aged PILC underground cable as part of the underground cable asset replacement strategy. Scope of replacements includes aged cable (78 years and older) as well as that which is necessary to effect the required transition splicing from solid dielectric cable to existing paper-lead cable.

Project Scope:

Install 2760 ckt ft of 4/0 Cu 15 kV CN cable, 1980 ckt ft of 500 kcmil compact Cu 15 kV FSN cable, and miscellaneous underground equipment.
 Remove various PILC cable: 1480 ft of 3/C-500 kcmil Cu, 90 ft of 3/C-450 kcmil Cu, 1800 ft of 3-1/C-4/0 Cu, 360 ft of 3/C-1/0 Cu, 130 ft of 3/C-100 kcmil Cu, 500 ft of 3-1/C-1/0 Cu, and miscellaneous underground equipment.

Project Alternatives Considered:

CL 4/18/14 - Estimate rev 2 conceptual estimate: \$470K (445 capital, 25K removal).
CL 6/3/13 - Estimate rev 1 for budget purposes: \$195K (175K capital, 10K O&M, 10K removal).
Project initiated for inclusion in FY14 budget and RI ISR - CL 9/19/12 at request of Cody)

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|-------------|---------------------------|-----------------|---------------------------|-------------------------------|
| Line 1: | Date | <u>4/22/2014 16:20:37</u> | Approver | <u>mokeym</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date | <u>4/23/2014 07:36:02</u> | Approver | <u>Diconza, Glen L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date | <u>4/23/2014 15:37:39</u> | Approver | <u>Constable, Ryan</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date | <u>4/24/2014 13:05:13</u> | Approver | <u>Pendrake, Robert C</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date | <u>5/2/2014 11:08:58</u> | Approver | <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046397 Current Total Authorized Amount: \$470,000.00

Title Fdr 1109A - Install Cable Dorrance

Project Number C046397

Budget Version Default (active)

Revision Conceptual

Revision Status Approved

Revision No. 3

Est Start Date 09/19/2012

Est Complete Date 03/31/2015

Est In Srvc Date 03/31/2014

Capital \$445,000.00

Expense \$0.00

Jobbing \$0.00

Retirement \$0.00

Removal \$25,000.00

Total (excl. Rets.) \$470,000.00

Credits \$0.00

Net \$470,000.00

Revision Info Other Updates

Revision 3 of 3

Find Revision

Send for Approval

Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from W/O

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Version Compare

Close

Record 1 of 1

Audits

C046398

Memorial Blvd Easton's Beach inst d

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046398</u> | USSC #: <u>USSC-14-123 v2C</u> |
| Revision: <u>9</u> | Budget Version: |
| Project Title: <u>Memorial Blvd Easton's Beach inst d</u> | |
| Project Description: This is an asset replacement project to relocate 2 - 25 kV circa 1965 direct buried cables from a ROW where it interferes with the cities Newport's drainage ditch to a duct and manhole system located in the road. The project involves installing 3,200 ft of 9 way duct bank along Memorial Blvd (Easton's Beach). Installing 2 - 25 kV, 3 - 1/C, 500 kcmil CU | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>BURKE, JOHN C</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line R1</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>18</u> | Project Complexity Score: <u>19</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|----------------|--------------|----------------|--------------------|-----------------|-----------------|--------------------|------------|
| Est Start Date: <u>9/19/2012</u> | Est Complete Date: <u>12/30/2016</u> | | | | | | | | | | |
| Est In-Service Date: <u>6/30/2016</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$1,481,730</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$1,440,000</u></td> <td><u>\$31,000</u></td> <td><u>\$10,000</u></td> <td><u>\$1,481,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$1,440,000</u> | <u>\$31,000</u> | <u>\$10,000</u> | <u>\$1,481,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$1,440,000</u> | <u>\$31,000</u> | <u>\$10,000</u> | <u>\$1,481,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

The direct-buried cables are located between the roadway and a drainage moat. Storms and drainage moat flooding have caused severe erosion of the embankment along which the cables are installed. For a length of approximately 300 feet, the required protective cover over the cables cannot be maintained. One circuit was completely exposed and undermined for a length of 5 feet. Permanent restoration of adequate cover is not possible without disturbing or altering the adjacent drainage moat, which is an integral part of the Easton Pond water supply to the City of Newport.

Project Scope:

The project involves installing 3,200 ft of 9 way duct bank on Memorial Blvd (Easton's Beach). Installing 3,500 circuit ft of 2 - 25 kV, 3 - 1/C, 500 kcmil CU, CN, XLPE cables. Retiring in place 2- 25 kV, 3c 250 kcmil CU, Plastex covered, C-L-X, direct buried cables. Retire the above ground splice tray and the surrounding protective fence on the Newport side of Memorial Blvd.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|----------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>12/16/2016 12:09:20</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C046398 Current Total Authorized Amount: \$1,48...

Title: Memorial Blvd Easton's Beach inst d
Project Number: C046398

Budget Version No Assigned Versions

Revision: Closure
Revision Status: Approved
Revision No.: 9
Est Start Date: 09/19/2012
Est Complete Date: 12/30/2016
Est In Srvc Date: 06/30/2016
Capital: \$1,440,000.00
Expense: \$31,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$10,000.00
Total (excl. Rets.): \$1,481,000.00
Credits: \$0.00
Net: \$1,481,000.00

Revision Info: Other Updates

Revision: 9 of 9
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare
Close

Record 1 of 1
Audits

D



USSC Closure Paper

| | | | |
|---------------------------|--------------------------------|--------------------------|--------------------------------------------------------------------|
| Title: | Memorial Blvd Cable Relocation | Sanction Paper #: | USSC-14-123 v2C |
| Project #: | C046398 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | December 13, 2016 |
| Author: | John Burke | Sponsor: | Carol Sedewitz, Vice President, Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | John Burke |

1 Executive Summary

This paper is presented to close C046398. The total spend was \$1.481M. The latest sanctioned amount for this project was \$1.615M.

Note the original sanction amount was \$1.415M.

The final spend amount is \$1.481M broken down into:

\$1.440M Capex
\$0.031M Opex
\$0.010M Removal

2 Project Summary

This is an asset replacement project to relocate 2 - 25 kV, non-standard, direct buried, submarine cables from the shoulder of the road, where they interfere with a drainage moat and the roadway's storm drainage system, to a duct and manhole system located within the roadway. This project was successfully placed in service in March 2016. Due to the drought this past summer, there is an area of the former laydown yard that requires re-seeding in the spring of 2017.

USSC Closure Paper



3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|--------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C046398 | Memorial Blvd Cable Relocation | Capex | 1.440 |
| | | Opex | 0.031 |
| | | Removal | 0.010 |
| | | Total | 1.481 |
| | | | |
| Total | | Capex | 1.440 |
| | | Opex | 0.031 |
| | | Removal | 0.010 |
| | | Total | 1.481 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 1.390 |
| | | Opex | 0.016 |
| | | Removal | 0.009 |
| | | Total Cost | 1.415 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.050) |
| | | Opex | (0.015) |
| | | Removal | (0.001) |
| | | Total Variance | (0.066) |

3.2 Analysis

This project was re-sanctioned due to higher than anticipated costs for final restoration of the roadway. State inspectors required milling and paving of the roadway from curb to centerline. This almost tripled the area requiring work and as a result increased costs by \$0.130M at the end of the project.



USSC Closure Paper

Improvements / Lessons Learned

The cost of final restoration was based on the minimum requirements set forth in the Rhode Island Department of Transportation (RIDOT) permit. Therefore, the cost for final restoration was based on the minimum of a one foot offset for milling and paving. After milling RIDOT inspectors instructed the contractor to mill and pave from curb to center line.

The lesson learned here is to confirm the state's requirement and expectation regarding paving or have the contractor bid the minimum and maximum paving amount. This would reduce the risk associated with change orders when a project is in final restoration. (LL#713)

4 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

5 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Alan Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Project Management | Andrew Schneller | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Jammie Simonds | Endorses Cost Estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

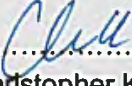
| Function | Individual |
|-------------------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |
| Procurement | Art Curran |
| Control Center | Michael Gallagher |

USSC Closure Paper



6 Decisions

I approve this paper.

Signature..........Date...December 13, 2016.....
Executive Sponsor – Christopher Kelly, Acting SVP Electric Process and Engineering

C046399

Fdr 1103 Inst Cable So Main St Prov

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C046399</u> Revision: <u>3</u> Project Title: <u>Fdr 1103 Inst Cable So Main St Prov</u> Project Description: Feeder 1103 out of Dyer Street substation in Providence supplies customers in the East Side of Providence. This project covers expenditures necessary to replace aged paper-lead cable in a limited area on the feeder as part of the underground cable replacement initiative | USSC #: Budget Version: <u>Default</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Status: <u>Closed</u> Responsible Person: <u>CURLEY, JOSEPH</u> Spending Rationale: <u>Asset Condition</u> Budget Class: <u>Asset Replacement</u> Capital by Category: Program Code: Project Risk Score: <u>36</u> | Initiator: <u>Holden, Eric H</u> Funding Type: <u>P Electric Distribution Line RI</u> Project Complexity Score: <u>14</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

Project Schedule / Expenditures

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Revision Status: <u>Approved</u> Est Start Date: <u>9/20/2012</u> Est In-Service Date: <u>3/31/2014</u> TTD Actuals: <u>\$432,942</u> | Est Complete Date: <u>3/31/2015</u> As Of: <u>10/2/2017</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|

| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
|----------------|----------------|----------------|----------------|--------------|----------------|
| | \$215,000 | \$130,000 | \$85,000 | \$430,000 | \$0 |

Justification / Risk Identification:

This project proactively replaces aged PILC underground cable as part of the underground cable asset replacement strategy. Scope of replacements includes aged cable (85 years and older) as well as that which is necessary to effect the required transition splicing from solid dielectric cable to existing paper-lead cable.

Project Scope:

Install 100 ckt ft of 500 kcmil Cu EPR 15 kV CN cable, 5200 ckt ft of 4/0 Cu 15 kV CN cable, and miscellaneous underground equipment.
 Remove various PILC cable: 285 ft of 3/C-300 kcmil Cu, 3500 ft of 3/C-3/0 Cu, 350 ckt ft of 1/C-500 kcmil Cu, 300 ckt ft of 1/C-4/0 Cu, and 300 ckt ft of 1/C-3/0 Cu.

Project Alternatives Considered:

CL 3/22/13 - Est rev 1 - \$30K for eng/design. Conceptual estimate \$425K (375K capital, 10K O&M, 40K removal).

Additional Notes:

Project initiated for inclusion in FY14 budget and RI ISR - CL 9/20/12.

Attached revised sketch to reflect mainline construction for future new 12 kV feeder from new 12 kV sub - CL 9/30/13.

Sanction from \$30k to \$430K email sent from Julie Spaziano. Document attached. Details on the justification and scope tab. This project was approved for 30K in March, 2013. The original 30K estimate was for Engineering & Design costs only. Based on the design it has been determined that the job will cost \$430K for the total project.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|------------|
| Line 1: | Date | <u>1/28/2014 12:45:50</u> | Approver | <u>labara</u> | Approver 1 |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C046399 Current Total Authorized Amount: \$430,000.00

Title: Fdr 1103 Inst Cable So Main St Prov

Project Number: C046399

Budget Version Default (active)

Revision:

Revision Status: Approved

Revision No.: 3

Est Start Date: 09/20/2012

Est Complete Date: 03/31/2015

Est In Srvc Date: 03/31/2014

Capital: \$215,000.00

Expense: \$130,000.00

Jobbing: \$0.00

Retirement: \$0.00

Removal: \$85,000.00

Total (excl. Rets.): \$430,000.00

Credits: \$0.00

Net: \$430,000.00

Revision Info: Other Updates

Revision: 3 of 3

Find Revision

Send for Approval

Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from W/O

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Other:

Revision Comments

Released Dollars

Substitution

Slide

Version Compare

Close

Record 1 of 1

Audits

Project Re-Sanction Request

Version 8.3

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Distribution - Janice Flynn

Transmission - Matt Roby

| | |
|-------------------------|-----------------------------------------------------------|
| *Date: | 1/17/2014 |
| *Operating Company: | The Narragansett Electric Co. |
| *PowerPlant Project Id: | C046399 |
| *Project Name: | 19600 Fdr 1103 - Install Cable South Main St., Providence |
| Project Engineer: | John Castro |
| Project Manager: | Mike Mokey |

Original Project Estimate

| | |
|-----------------------------|-----------|
| *Date of Original Sanction: | 3/22/2013 |
|-----------------------------|-----------|

| Total | Capex | Opex | Removal |
|----------|----------|------|---------|
| \$30,000 | \$30,000 | \$0 | \$0 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|-----------|----------|
| \$430,000 | \$215,000 | \$130,000 | \$85,000 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-------|------|---------|
| \$0 | | | |

| Current FY | Capex | Opex | Removal |
|------------|-----------|-----------|----------|
| \$430,000 | \$215,000 | \$130,000 | \$85,000 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| |
|--|
| |
| |

Reason for Revision

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process |
| | New Project Estimated Completion Date: 3/31/2015 |

| | |
|--------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|--------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending (Please expand the row height if box doesn't fit)

| | |
|-------------------------------------|--------------------------------------------|
| <input checked="" type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|-------------------------------------|--------------------------------------------|

Project Re-Sanction Request

| | |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Install approximately 3400' of 15kv, 4/0 Cu, 3-1C cable, 1360' of 15kv, 1000kcmil Cu, 3-1/C cable, 400' of 500kcmil Cu, 3-1/C cable, and associated UG splices and equipment. Remove approximately 3700' of 4/0 Cu 1-3/C P&L cable and associated UG equipment.</p> |
| <input type="checkbox"/> | <p>Resource Allocation (Schedule, Delay, OT, or Contractor)</p> |
| <input checked="" type="checkbox"/> | <p>Low/High Estimate</p> <p>This project was approved for 30K in March, 2013. The original 30K estimate was for Engineering & Design costs only. Based on the design it has been determined that the job will cost 430K for the total project including construction. The following is a breakdown of costs for the project, 140K for Labor and Labor Overheads including Engineering & Design, 260K for Materials and Material Overheads, 15K for Transportation and 15K for Police protection bringing the total project cost to 430K</p> |
| <input type="checkbox"/> | <p>External Forces (Permitting Requirements, Weather, Contractor Issues, etc)</p> |

In-service Dates

*Original In-service Date: 9/20/2013

*Revised In-service Date: 3/31/2015

C046400

Capital Ctr Fdrs - Elim T-body join

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046400</u> | USSC #: <u>USSC-16-212C</u> |
| Revision: <u>9</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Capital Ctr Fdrs - Elim T-body join</u> | |
| Project Description: Replace T-Body splice on the Lippitt Hill 79F1 fdr in the capital center area of providence | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>14</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|----------------|--------------|----------------|------------------|-----------------|------------------|--------------------|------------|
| Est Start Date: <u>9/20/2012</u> | Est Complete Date: <u>1/30/2015</u> | | | | | | | | | | |
| Est In-Service Date: <u>1/30/2015</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$1,014,165</u> | As Of: <u>10/2/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$836,000</u></td> <td><u>\$13,000</u></td> <td><u>\$166,000</u></td> <td><u>\$1,015,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$836,000</u> | <u>\$13,000</u> | <u>\$166,000</u> | <u>\$1,015,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$836,000</u> | <u>\$13,000</u> | <u>\$166,000</u> | <u>\$1,015,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

Project initiated for inclusion in FY14 budget and RI ISR - CL 9/20/12 at request of Cody) This project starts the elimination of T- bodies on all fdrs in the Capital District, Providence RI. This work is necessary for the long term stability of the underground system in this area. The project will reduce the potential for ad-hoc / emergency repairs. Performance history of the separable T-body splices installed in 1980's and 1990's indicates a greater potential for failure than other type of splices used in our system. These troubled splices often present themselves as hot spots which require and have sometimes before scheduled work, been replaced. Replacing replacement is expected to reduce

Project Scope:

Replace T-body splices and cable sections as required on Lippitt Hill 79F1 Fdr along Charles St, Canal St, Smith St and the Providence Place mall facility in Providence, RI. Previous survey's indicate there are approximately 46 MH that have known T bodies. The pending design should also consider the replacement of T-bodies on other capital fdrs as the opportunity presents, that is, fdrs in the same MH that are switched out so work can be done on the 79F1.

Project Alternatives Considered:

This is an asset replacement project. The consequence of avoiding capital spending on this project is to continue to spend O&M dollars on emergency repairs.

Additional Notes:

Re-Sanction from \$700K to \$950K from Julie Spaziano. Continued identification of T-body splicing by Engineering has increased the scope of this project by 250k bringing the total project cost to 950k.
Known T-body splice locations on the Lippitt Hill Sub 79F1 fdr: Canel St MH1274, MH2681. Gaspee MH2648. MH 2649 and MH2651 and Providence Place Mall MH 2631 and 2632.
Use 15 kV, 1000 kcmil CU EPR cable for all section replacements.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | |
|----------------|--------------------------------------|-------------------------------|----------------------|
| Line 1: | Date <u>7/1/2016 08:08:38</u> | Approver <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | Approver | |
| Line 3: | Date | Approver | |
| Line 4: | Date | Approver | |
| Line 5: | Date | Approver | |

*****Project Authorization is for Approved Revision Total Estimated Cost + 10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 517 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPPlan Help Calc Print Win

Funding Project Estimates - Summary C046400 Current Total Authorized Amount: \$1,01...

Title: Capital Ctr Fdrs - Elim T-body join
Project Number: C046400

Budget Version Default (active)
Revision: 16-212C
Revision Status: Approved
Revision No.: 9
Est Start Date: 09/20/2012
Est Complete Date: 01/30/2015
Est In Srvc Date: 01/30/2015
Capital: \$836,000.00
Expense: \$13,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$166,000.00
Total (excl. Rets.): \$1,015,000.00
Credits: \$0.00
Net: \$1,015,000.00

Revision Info: Other Updates

Revision: 9 of 9
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close

Send for Approval



USSC Closure Paper

| | | | |
|---------------------------|--------------------------------------------|--------------------------|----------------------------------------------|
| Title: | Capital Center Feeders - Elim T-body joint | Sanction Paper #: | USSC-16-212C |
| Project #: | C046400 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 06/07/2016 |
| Author: | Joe Curley | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Joe Curley |

1 Executive Summary

This paper is presented to close C046400. The total spend was \$1.015M The latest sanctioned amount for this project was \$0.950M.

The final spend amount is \$1.015M broken down into:

*\$0.836M Capex
\$0.013M Opex
\$0.166M Removal*

2 Project Summary

This project starts the elimination of T- bodies on all feeders in the Capital District Underground Area of Providence. This work is necessary for the long term stability of the underground system in this area. The project will reduce the potential for ad-hoc / emergency repairs. Performance history of the separable T-body splices installed in 1980's and 1990's indicates a greater potential of failure than other types of splices used in our system. These troubled splices present themselves as hot spots which require ad-hoc maintenance before scheduled work can begin. Proactive replacement is expected to reduce both O&M cost and restoration times for customers.



USSC Closure Paper

3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|-------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C046400 | Capital Ctr Fdrs - Elim T-body join | Capex | 0.836 |
| | | Opex | 0.013 |
| | | Removal | 0.166 |
| | | Total | 1.015 |
| | | | |
| Total | | Capex | 0.836 |
| | | Opex | 0.013 |
| | | Removal | 0.166 |
| | | Total | 1.015 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 0.808 |
| | | Opex | 0.047 |
| | | Removal | 0.095 |
| | | Total Cost | 0.950 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.028) |
| | | Opex | 0.034 |
| | | Removal | (0.071) |
| | | Total Variance | (0.065) |

3.2 Analysis

4 Improvements / Lessons Learned

This project was originally created due to two T-Body failures that occurred in a short period of time on this feeder affecting the Capital Center and sensitive customer loads. Due to the condition of the T bodies, it was determined that additional T bodies in critical locations should be proactively replaced on the 79F1 to try to ensure improved reliability on this feeder.

5 Closeout Activities



USSC Closure Paper

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|---------------------------|---------------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman, Mark Phillips | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management/Planning | Alan Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.

USSC Closure Paper



| Function | Individual |
|-------------------------|----------------|
| Finance | Mark Collison |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |
| Procurement | Art Curran |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature..........Date.....

Executive Sponsor – Christopher Kelly,
Acting Senior Vice President – Electric Process & Engineering

C046405

Fdr 1113 Inst Cable Fountain St Pro

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C046405</u> Revision: <u>4</u> Project Title: <u>Fdr 1113 Inst Cable Fountain St Pro</u> Project Description: Feeder 1113 out of South Street substation in Providence is one of eight feeders supplying the downtown Providence AC network. This project covers expenditures necessary to replace aged paper-lead cable in a limited area of the feeder as part of the underground cable replacement initiative. | USSC #: Budget Version: <u>Default</u> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>14</u> |

Project Schedule / Expenditures

| | |
|----------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>9/19/2012</u> | Est Complete Date: <u>9/12/2014</u> |
| Est In-Service Date: <u>9/12/2014</u> | |
| TTD Actuals: <u>\$299,985</u> | As Of: <u>10/2/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$195,200</u> | <u>\$70,400</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$54,400</u> | <u>\$320,000</u> |
| | <u>Credits</u> |
| | <u>\$0</u> |

Justification / Risk Identification:

This project proactively replaces aged PILC underground cable as part of the underground cable asset replacement strategy. Scope of replacements includes aged cable (75 years and older) as well as that which is necessary to effect the required transition splicing from solid dielectric cable to existing paper-lead cable.

Project Scope:

Install 2850 ckt ft of 4/0 Cu 15 kV CN cable and miscellaneous underground equipment.
Remove various PILC cable: 1970 ft of 3/C-1/0 Cu, 350 ft of 3/C-4/0 Cu, 320 ckt ft of 1/C-4/0 Cu, and 75 ckt ft of 1/C-1/0 Cu.

Project Alternatives Considered:

CL 5/22/13 - Est rev 1 - \$30K for eng/design. Conceptual estimate \$390K (340K capital, 10K O&M, 40K removal).

Additional Notes:

Resanction from \$245K to \$320K from Julie Spaziano. Document attached details on the justification and scope tab. Civil was not included on the original estimate for 45K. In addition, there were outages required in order to complete this project which had to be done on off hours resulting in an additional 30K in Labor and Labor overheads bringing the total project cost to 320K.

Project initiated for inclusion to FY14 budget and RIPUC. CL 5/22/13

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|----------------------------|----------|---------------------------|-------------------------------|
| Line 1: | Date | <u>12/2/2014 09:36:08</u> | Approver | <u>mokeym</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date | <u>12/11/2014 15:00:23</u> | Approver | <u>Diconza, Glen L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date | <u>1/5/2015 09:38:26</u> | Approver | <u>Constable, Ryan</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date | <u>1/6/2015 07:33:01</u> | Approver | <u>Pendrake, Robert C</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date | <u>1/28/2015 12:34:08</u> | Approver | <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046405 Current Total Authorized Amount: \$320,000.00

Title: Fdr 1113 Inst Cable Fountain St Pro
Project Number: C046405

Budget Version Default (active)
Revision:
Revision Status: Approved
Revision No.: 4
Est Start Date: 09/19/2012
Est Complete Date: 09/12/2014
Est In Srvc Date: 09/12/2014
Capital: \$195,200.00
Expense: \$70,400.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$54,400.00
Total (excl. Rets.): \$320,000.00
Credits: \$0.00
Net: \$320,000.00

Revision Info: Other Updates

Revision: 4 of 4
Find Revision
Send for Approval
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from WO
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare
Close

Record 2 of 2
Audits

Change in DOA Request Form **(Less than Million)**

Version 9.0

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Electric - Janice Flynn

| | |
|--------------------------|--------------------------------------|
| * Date: | 11/24/2014 |
| * Operating Company: | The Narragansett Electric Co. |
| * PowerPlant Project Id: | C046405 |
| * Project Name: | Fdr 1113 Inst Cable Fountain St Prov |
| * Project Engineer: | John Castro |
| * Project Manager: | Joe Curley |

Latest Project Estimate

| | |
|----------------------------|-----------|
| * Date of Latest Sanction: | 7/15/2014 |
|----------------------------|-----------|

| Total | Capex | Opex | Removal |
|-----------|-----------|----------|----------|
| \$245,000 | \$149,450 | \$53,900 | \$41,650 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|----------|----------|
| \$320,000 | \$195,200 | \$70,400 | \$54,400 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-------|------|---------|
| \$0 | | | |

| Current FY | Capex | Opex | Removal |
|------------|-----------|----------|----------|
| \$320,000 | \$195,200 | \$70,400 | \$54,400 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| | |
|--|--|
| | |
|--|--|

Reason for Revision

| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process <div style="text-align: right;">New Project Estimated Completion Date: </div> |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|-------------------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending **(Please expand the row height if box doesn't fit)**

| | |
|--------------------------|--------------------------------------------|
| <input type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|--------------------------|--------------------------------------------|

Change in DOA Request Form (Less than Million)

| | |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| <input type="checkbox"/> | Resource Allocation (Schedule, Delay, OT, or Contractor) |
| <input checked="" type="checkbox"/> | Low/High Estimate Civil was not included on the original estimate for 45K. In addition, there were outages required in order to complete this project which had to be done on off hours resulting in an additional 30K in Labor and Labor overheads bringing the total project cost to 320K. |
| <input type="checkbox"/> | External Forces (Permitting Requirements, Weather, Contractor Issues, etc) |

In-service Dates

*Original In-service Date: 3/31/2014
 *Revised In-service Date: 9/12/2014

C046406

Fdr 1109B Inst Cable Pine St & west

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C046406</u> Revision: <u>5</u> Project Title: <u>Fdr 1109B Inst Cable Pine St & west</u> Project Description: Feeder 1109 out of Dyer Street substation in Providence is one of eight feeders supplying the downtown Providence AC network. This project covers expenditures necessary to replace aged paper-lead cable in a limited area on the "B" portion of the feeder as part of the underground cable replacement initiative. | USSC #: Budget Version: <u>Default</u> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Status: <u>open</u> Responsible Person: <u>MOKEY, MICHAEL</u> Spending Rationale: <u>Asset Condition</u> Budget Class: <u>Asset Replacement</u> Capital by Category: Program Code: Project Risk Score: <u>36</u> | Initiator: <u>Holden, Eric H</u> Funding Type: <u>P Electric Distribution Line RI</u> Project Complexity Score: <u>14</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

Project Schedule / Expenditures

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Revision Status: <u>Approved</u> Est Start Date: <u>9/19/2012</u> Est In-Service Date: <u>3/31/2014</u> TTD Actuals: <u>\$380,860</u> | Est Complete Date: <u>3/31/2015</u> As Of: <u>10/3/2017</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|

| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
|----------------|----------------|----------------|----------------|--------------|----------------|
| | \$256,500 | \$108,000 | \$85,500 | \$450,000 | \$0 |

Justification / Risk Identification:

This project proactively replaces aged PILC underground cable as part of the underground cable asset replacement strategy. Scope of replacements includes aged cable (75 years and older) as well as that which is necessary to effect the required transition splicing from solid dielectric cable to existing paper-lead cable.

Project Scope:

Install 5100 ckt ft of 4/0 Cu 15 kV CN cable and miscellaneous underground equipment.
 Remove various PILC cable: 1275 ft of 3/C-500 kcmil Cu, 480 ft of 3/C-450 kcmil Cu, 1340 ft of 3/C-350 kcmil Cu, 680 ft of 3-1/C-4/0 Cu, 750 ft of 3/C-1/0 Cu, 195 ft of 3-1/C-1/0 Cu, and miscellaneous underground equipment.

Project Alternatives Considered:

CL 6/10/13 - Estimate rev 4 - \$30K for eng/design.
CL 6/10/13 - Estimate rev 3 conceptual estimate: \$635K (580K capital, 10K O&M, 45K removal).
CL 6/3/13 - Estimate rev 1 for budget purposes: \$450K (430K capital, 10K O&M, 10K removal).
CL 9/19/12 Project initiated at request of Cody for inclusion in FY14 budget and RI ISR.
Remove various PILC cable: 1275 ft of 3/C-500 kcmil Cu, 480 ft of 3/C-450 kcmil Cu, 1340 ft of 3/C-350 kcmil Cu,
220 ft of 3/C-1/0 Cu, 750 ft of 3/C-1/0 Cu, 405 ft of 3/C-1/0 Cu, and miscellaneous underground equipment

Additional Notes:

Sanction from \$30K to \$450K from Julie Spaziano. This project was approved for 30K in June, 2013 for Pre-engineering costs. Based on the design it has been determined that the job will cost 450K for the total project including construction. The following is a breakdown of costs for the project, 220K for Labor and Labor Overheads including Engineering & Design, 180K for Materials and Material Overheads, 20K for transportation and 30k for Police Protection bringing the total project cost to 450K. Install 5100 ckt ft of 4/0 Cu 15 kV CN cable and miscellaneous

Related Projects:

Project Number: **Project Name:**

Approvals

| | | | |
|----------------|--------------------------------------|-------------------------------|-------------------|
| Line 1: | Date <u>3/7/2014 12:30:05</u> | Approver <u>labara</u> | <u>Approver 1</u> |
| Line 2: | Date | Approver | |
| Line 3: | Date | Approver | |
| Line 4: | Date | Approver | |
| Line 5: | Date | Approver | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046406 Current Total Authorized Amount: \$450,000.00

Title: Fdr 1109B Inst Cable Pine St & west
Project Number: C046406

Budget Version Default (active)
Revision: SN Form
Revision Status: Approved
Revision No.: 5
Est Start Date: 09/19/2012
Est Complete Date: 03/31/2015
Est In Srvc Date: 03/31/2014
Capital: \$256,500.00
Expense: \$108,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$85,500.00
Total (excl. Rets.): \$450,000.00
Credits: \$0.00
Net: \$450,000.00

Revision Info: Other Updates

Revision: 5 of 5
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close

Project Re-Sanction Request

Version 8.3

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Distribution - Janice Flynn

Transmission - Matt Roby

| | |
|-------------------------|-------------------------------------|
| *Date: | 2/18/2014 |
| *Operating Company: | The Narragansett Electric Co. |
| *PowerPlant Project Id: | C046406 |
| *Project Name: | Fdr 1109B Inst Cable Pine St & west |
| Project Engineer: | John Castro |
| Project Manager: | Mike Mokey |

Original Project Estimate

| | |
|-----------------------------|-----------|
| *Date of Original Sanction: | 6/11/2013 |
|-----------------------------|-----------|

| Total | Capex | Opex | Removal |
|----------|----------|------|---------|
| \$30,000 | \$30,000 | \$0 | \$0 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|-----------|----------|
| \$450,000 | \$256,500 | \$108,000 | \$85,500 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-------|------|---------|
| \$0 | | | |

| Current FY | Capex | Opex | Removal |
|------------|-----------|-----------|----------|
| \$450,000 | \$256,500 | \$108,000 | \$85,500 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| |
|--|
| |
|--|

Reason for Revision

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process |
| | New Project Estimated Completion Date: 3/26/2014 |

| | |
|--------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|--------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending (Please expand the row height if box doesn't fit)

| | |
|-------------------------------------|--------------------------------------------|
| <input checked="" type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|-------------------------------------|--------------------------------------------|

Project Re-Sanction Request

| | |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Install 5100 ckt ft of 4/0 Cu 15 kV CN cable and miscellaneous underground equipment. Remove various PILC cable: 1275 ft of 3/C-500 kcmil Cu, 480 ft of 3/C-450 kcmil Cu, 1340 ft of 3/C-350 kcmil Cu, 680 ft of 3-1/C-4/0 Cu, 750 ft of 3/C-1/0 Cu, 195 ft of 3-1/C-1/0 Cu, and miscellaneous underground equipment.</p> |
| <input type="checkbox"/> | <p>Resource Allocation (Schedule, Delay, OT, or Contractor)</p> |
| <input checked="" type="checkbox"/> | <p>Low/High Estimate</p> <p>This project was approved for 30K in June, 2013 for Pre-engineering costs. Based on the design it has been determined that the job will cost 450K for the total project including construction. The following is a breakdown of costs for the project, 220K for Labor and Labor Overheads including Engineering & Design, 180K for Materials and Material Overheads, 20K for transportation and 30k for Police Protection bringing the total project cost to 450K.</p> |
| <input type="checkbox"/> | <p>External Forces (Permitting Requirements, Weather, Contractor Issues, etc)</p> |

In-service Dates

*Original In-service Date:

*Revised In-service Date:

C046506

Tunk Hill Road, Scituate RI, Storm

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046506</u> | USSC #: <u>USSC-13-182C</u> |
| Revision: <u>3</u> | Budget Version: <u>Default</u> |
| Project Title: <u>Tunk Hill Road, Scituate RI, Storm</u> | |
| Project Description: Reconductor 10,300 feet of 1/0 Al with 477 spacer cable from pole 21 Hope Furnace Road to pole 87 Tunk Hill Road in Scituate, RI. Also perform tree trimming along the entire stretch of Tunk Hill Rd (from pole 18 Hope Furnace Rd to po | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Reliability</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>30</u> | Project Complexity Score: <u>16</u> |

Project Schedule / Expenditures

| | |
|---------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>6/21/2012</u> | Est Complete Date: <u>3/31/2015</u> |
| Est In-Service Date: <u>6/1/2014</u> | |
| TTD Actuals: <u>\$1,570,456</u> | As Of: <u>10/3/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$1,376,000</u> | <u>\$142,000</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$53,000</u> | <u>\$1,571,000</u> |
| | <u>Credits</u> |
| | <u>\$0</u> |

Justification / Risk Identification:

This job was identified as work to be done under the Pockets of Poor Performance Strategy. Between 2006 and 2008, there were nine tree related mainline outages that occurred on this road. This work will tree trim the all of Tunk Hill Rd and will also reconductor a section of this road with 477 spacer cable.

Project Scope:

Reconductor 10,300 feet of 1/0 Al with 477 spacer cable from pole 21 Hope Furnace Road to pole 87 Tunk Hill Road in Scituate, RI. Also perform tree trimming along the entire stretch of Tunk Hill Rd (from pole 18 Hope Furnace Rd to pole 274 Plainfield Pike in Scituate) Preliminary Engineering.

Project Alternatives Considered:

<Enter data here>

Additional Notes:

scope is updated/increased due to storm hardening/CEMI program

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>8/31/2016 12:13:46</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046506 Current Total Authorized Amount: \$1,57...

Title **Tunk Hill Road, Scituate RI, Storm**

Project Number **C046506**

Budget Version Default [active]

Revision **Closure**

Revision Status **Approved**

Revision No. **3**

Est Start Date **06/21/2012**

Est Complete Date **06/02/2014**

Est In Srvc Date **06/01/2014**

Capital **\$1,376,000.00**

Expense **\$142,000.00**

Jobbing **\$0.00**

Retirement **\$0.00**

Removal **\$53,000.00**

Total (excl. Rets.) **\$1,571,000.00**

Credits **\$0.00**

Net **\$1,571,000.00**

Revision Info **Other Updates**

Revision **3** of **3** **< > >>**

[Find Revision](#) **Send for Approval**

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record 1 of 1 < > >>

Audits



USSC Closure Paper

| | | | |
|---------------------------|-----------------------------------------------|--------------------------|-------------------------------------------------------|
| Title: | Tunk Hill Road; Scituate, RI Storm Closure | Sanction Paper #: | USSC-13-182C |
| Project #: | C046506 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 08/23/2016 |
| Author: | Joe Curley | Sponsor: | Carol Sedewitz, VP Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | Joe Curley |

1 Executive Summary

This paper is presented to close C046506. The total spend was \$1.571M. The latest sanctioned amount for this project was \$1.850M.

The final spend amount is \$1.571M broken down into:

\$1.376M Capex
\$0.142M Opex
\$0.053M Removal

2 Project Summary

This paper is provided for closure for project C046506. Funding was provided for reconductoring a two mile section of the open wire primary with spacer cable from pole 21 Hope Furnace Road to pole 87 Tunk Hill Road. This project also recommended enhance tree trimming along the entire length of Tunk Hill Road from pole 18 Hope Furnace Road to pole 274 Plainville Pine in Scituate, RI. Over the past ten years, this feeder had a significant number of mainline events, particularly in the section along Tunk Hill Road in Scituate. Most of these outages were caused by trees contacting the open wire primary.



USSC Closure Paper

3 Over / Under Expenditure Analysis

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C046506 | Tunk Hill Road, Scituate RI, Storm | Capex | 1.376 |
| | | Opex | 0.142 |
| | | Removal | 0.053 |
| | | Total | 1.571 |
| | | | |
| Total | | Capex | 1.376 |
| | | Opex | 0.142 |
| | | Removal | 0.053 |
| | | Total | 1.571 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 1.280 |
| | | Opex | 0.070 |
| | | Removal | 0.500 |
| | | Total Cost | 1.850 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.096) |
| | | Opex | (0.072) |
| | | Removal | 0.447 |
| | | Total Variance | 0.279 |

3.2 Analysis

N/A

4 Improvements / Lessons Learned

This project experienced delays as a result of meetings with the town- specifically their fire chief. The municipality required a more detailed traffic plan, as a result of a DOT project that did not require National Grid's participation. The concern with both of these projects taking place at the same time resulted in several meetings with the town and RIDOT to ensure a safe traffic pattern was in place. Some additional delays took place while setting poles due to ledge, which required specialized equipment to complete the work.



USSC Closure Paper

5 Closeout Activities

The following closeout activities have been completed.

| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |



USSC Closure Paper

6 Statements of Support

6.1 **Supporters**

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-------------------------------|--------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Distribution Asset Management | Alan Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |

6.2 **Reviewers**

The reviewers have provided feedback on the content/language of the paper.

| Function | Individual |
|--------------------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegates | Jim Patterson |
| Procurement | Art Curran |



USSC Closure Paper

7 Decisions

I approve this paper.

Signature.....  Date..... 

Executive Sponsor -- Christopher Kelly,
Acting Senior Vice President – Electric Process & Engineering

C046697

Hope Substation Flood Restoration

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| Fund Project Number: <u>C046697</u> Revision: <u>1</u> Project Title: <u>Hope Substation Flood Restoration</u> Project Description: To mitigate potential flood damage to Hope substation equipment it is recommended to elevate the substation equipment at risk. Refer to the attached Conceptual Engineering Report dated 10/4/12 for scope of this work. | USSC #: Budget Version: <u>Default</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Status: <u>suspended</u> Responsible Person: <u>PHILLIPS, MARK</u> Spending Rationale: <u>Asset Condition</u> Budget Class: <u>Asset Replacement</u> Capital by Category: Program Code: Project Risk Score: <u>31</u> | Initiator: <u>Holden, Eric H</u> Funding Type: <u>P Electric Distribution Sub RI</u> Project Complexity Score: <u>14</u> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

Project Schedule / Expenditures

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Revision Status: <u>Approved</u> Est Start Date: <u>8/23/2011</u> Est In-Service Date: <u>3/21/2014</u> TTD Actuals: <u>\$304,875</u> | Est Complete Date: <u>3/31/2015</u> As Of: <u>10/3/2017</u> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|

| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
|----------------|----------------|----------------|----------------|--------------|----------------|
| | \$350,000 | \$25,000 | \$35,000 | \$410,000 | \$0 |

Justification / Risk Identification:

See attachment for detailed description of flooding damage at substation.

Project Scope:

Between March 30 and April 1, 2010, Rhode Island was impacted by flooding, with water levels reaching a peak level of about 28 inches above grade at this substation. Hope Substation is a 23 -12.47kV substation with two 22.9-12.47kV, 7.5/9.4 MVA transformers, which supply two 12.47kV feeders. Inside the control building, flood waters reached a peak level of 21 inches, which partially submerged the station battery and several relays.

The existing base flood elevation for the area is approximately 400 and the existing grade of the substation is

Project Alternatives Considered:

No economical alternative exists to this work.

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|----------------------------|----------|---------------|-------------------|
| Line 1: | Date | <u>12/31/2012 12:49:49</u> | Approver | <u>sherir</u> | <u>Approver 1</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 547 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046697 Current Total Authorized Amount: \$410,...

Title: Hope Substation Flood Restoration

Project Number: C046697

Budget Version Default (active)

Revision:

Revision Status: Approved

Revision No.: 1

Est Start Date: 08/23/2011

Est Complete Date: 03/31/2014

Est In Srvc Date: 03/21/2014

Capital: \$350,000.00

Expense: \$25,000.00

Jobbing: \$0.00

Retirement: \$0.00

Removal: \$35,000.00

Total (excl. Rets.): \$410,000.00

Credits: \$0.00

Net: \$410,000.00

Revision Info: Other Updates

Revision: 1 of 2

Find Revision

Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record 1 of 1

Audits

C046831

CLARKE 65J12 Feeder Upgrade (D-Sub)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046831</u> | USSC #: <u>USSC-12-085 v4C</u> |
| Revision: <u>8</u> | Budget Version: |
| Project Title: <u>CLARKE 65J12 Feeder Upgrade (D-Sub)</u> | |
| Project Description: Upgrade 65J12 feeder utilizing a MITS design with a 3.75/4.68 MVA transformer | |

| | |
|---------------------------------------------------------------------|------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>ARTHUR, DAVID</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Sub RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>37</u> | Project Complexity Score: <u>22</u> |

Project Schedule / Expenditures

| | |
|----------------------------------------------|--------------------------------------------|
| Revision Status: <u>Approved</u> | |
| Est Start Date: <u>3/18/2011</u> | Est Complete Date: <u>6/30/2016</u> |
| Est In-Service Date: <u>2/28/2016</u> | |
| TTD Actuals: <u>\$2,224,666</u> | As Of: <u>10/3/2017</u> |
| Cost Breakdown | |
| <u>Capital</u> | <u>Expense</u> |
| <u>\$2,173,000</u> | <u>\$15,000</u> |
| <u>Removal</u> | <u>Total</u> |
| <u>\$38,000</u> | <u>\$2,226,000</u> |
| | <u>Credits</u> |
| | <u>\$0</u> |

Justification / Risk Identification:

Clarke Street substation is a 23/4.16kV station with two modular feeders and supplies the southern half of the Island of Jamestown. This station is highly utilized and the following loading concerns need to be addressed:

- 1) The 65J12 Feeder is projected to be loaded above SN ratings in 2012 (103% of SN).
- 2) The 65J2 Feeder is projected to be loaded above SN ratings in 2013 (102% of SN).

Project Scope:

PLAN 1 - RECOMMENDED Plan. Upgrade 65J12 feeder utilizing a MITS design with a 3.75/4.68 MVA transformer. All feeder equipment has to be replaced because both the existing transformer & breaker are attached to a common metal-clad structure and cannot be split apart. This plan, along with the associated D-Line project, will resolve all loading concerns at Clarke Street substation. Refer to attached Scope of Work document.

Project Alternatives Considered:

PLAN 2 - NOT Recommended. Install a MITS modular feeder in southern Jamestown. Company would need to purchase land to house this MITS. The estimated cost of this Plan is \$2.9M of which \$1M is assumed for the cost of land. A suitable parcel of land in Southern Jamestown to house this MITS is expected to be extremely difficult to located and the cost could much higher than the assumed \$1M. This plan is substantially more expensive and higher risk than the preferred plan.

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>2/23/2017 14:29:21</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C046831 Current Total Authorized Amount: \$2,22... _ □ X

Title **CLARKE 65J12 Feeder Upgrade (D-Sub)**

Project Number **C046831**

Budget Version No Assigned Versions

Revision **Closure**

Revision Status **Approved**

Revision No. **8**

Est Start Date **03/18/2011**

Est Complete Date **06/30/2016**

Est In Srvc Date **02/28/2016**

Capital **\$2,173,000.00**

Expense **\$15,000.00**

Jobbing **\$0.00**

Retirement **\$0.00**

Removal **\$38,000.00**

Total (excl. Rets.) **\$2,226,000.00**

Credits **\$0.00**

Net **\$2,226,000.00**

Revision Info **Other Updates**

Revision **8** of **8** < < > >

[Find Revision](#) [Send for Approval](#)

☐ Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record **1** of **1** < < > >

Audits



USSC Closure Paper

| | | | |
|---------------------------|--------------------------------|--------------------------|-----------------------------------------------------------|
| Title: | Clarke St 65J12 Feeder Upgrade | Sanction Paper #: | USSC-12-085 v5C |
| Project #: | C046831, C046832 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 2/14/17 |
| Author: | David P. Arthur | Sponsor: | Carol Sedewitz, Vice President, Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | David P. Arthur |

1 Executive Summary

This paper is presented to close C046831 and C046832. The total spend was \$2.725M. The latest sanctioned amount for this project was \$2.894M with a tolerance of +/-10%.

The final spend amount is \$2.725M broken down into:

*\$2.598 Capex
\$0.038 Opex
\$0.089 Removal*

2 Project Summary

This project was required to address reliability concerns on the Island of Jamestown. The concerns addressed in this area were, that the two Clarke Street substation feeders were highly utilized and by 2014 loading on the 65J2 was projected to exceed summer normal ratings. Additionally, the Clarke Street 652 transformer, which supplied the 65J12 feeder, was on the Highly Utilized Transformer list for approximately ten years and had deteriorated transformer insulation. Also, there were signs of oil leaks inside the transformer compartment. Lastly, the 65J12 breaker was recommended for replacement due to asset condition concerns.

To resolve these concerns the recommended plan was to upgrade the Clarke Street 65J12 feeder, transformer and breaker. This investment resolved the projected overloads on Clarke Street feeders and addressed the asset condition concerns.

3 Over / Under Expenditure Analysis



USSC Closure Paper

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|-------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C046831 | CLARKE 65J12 Feeder Upgrade (D-Sub) | Capex | 2.173 |
| | | Opex | 0.015 |
| | | Removal | 0.038 |
| | | Total | 2.226 |
| Project # | Description | | Total Spend |
| C046832 | CLARKE St Feeder Upgrades (D-Line) | Capex | 0.425 |
| | | Opex | 0.023 |
| | | Removal | 0.051 |
| | | Total | 0.499 |
| Total | | Capex | 2.598 |
| | | Opex | 0.038 |
| | | Removal | 0.089 |
| | | Total | 2.725 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 2.519 |
| | | Opex | 0.022 |
| | | Removal | 0.098 |
| | | Total Cost | 2.639 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.079) |
| | | Opex | (0.016) |
| | | Removal | 0.009 |
| | | Total Variance | (0.086) |

3.2 Analysis

The project was completed within the allowed budget. Additional landscaping mitigation at the station was required as a result of neighborhood outreach. This increased the cost of the overall project, however the final cost is within the estimate tolerance.

4 Improvements / Lessons Learned

Ensure that project risk or estimate includes costs for landscaping improvements and EMF analysis if the station is located within a residential area.

5 Closeout Activities

The following closeout activities have been completed.

USSC Closure Paper



| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|----------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Resource Planning | Mark Phillips | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Alan T. Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Suzan E. Martuscello | Endorses scope, design, conformance with design standards |
| Engineering and Design | Leonard G. Swanson | Endorses scope, design, conformance with design standards |

USSC Closure Paper



| | | |
|-----------------------------|------------------|---------------------------------------------|
| Project Management | Andrew Schneller | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Dan Marceau | Endorses cost estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.



| Function | Individual |
|-------------------------|----------------|
| Finance | Richard Helm |
| Finance | Mark Collison |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature..........Date..........
Chris Kelly, Senior Vice President, Electric Process & Engineering

C046832

CLARKE St Feeder Upgrades (D-Line)

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C046832</u> | USSC #: <u>USSC-12-085 v4C</u> |
| Revision: <u>7</u> | Budget Version: |
| Project Title: <u>CLARKE St Feeder Upgrades (D-Line)</u> | |
| Project Description: Upgrade 65J12 feeder utilizing a MITS design with a 3.75/4.68 MVA transformer. Reinforce feeders as shown in scope document. | |

| | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>ARTHUR, DAVID</u> | Initiator: <u>Holden, Eric H</u> |
| Spending Rationale: <u>System Capacity & Performance</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Load Relief</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>37</u> | Project Complexity Score: <u>22</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|--------------|----------------|------------------|-----------------|-----------------|------------------|------------|
| Est Start Date: <u>3/18/2011</u> | Est Complete Date: <u>6/1/2016</u> | | | | | | | | | | |
| Est In-Service Date: <u>2/28/2016</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$498,688</u> | As Of: <u>10/3/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$425,000</u></td> <td><u>\$23,000</u></td> <td><u>\$51,000</u></td> <td><u>\$499,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$425,000</u> | <u>\$23,000</u> | <u>\$51,000</u> | <u>\$499,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$425,000</u> | <u>\$23,000</u> | <u>\$51,000</u> | <u>\$499,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

Clarke Street substation is a 23/4.16kV station with two modular feeders and supplies the southern half of the Island of Jamestown. This station is highly utilized and the following loading concerns need to be addressed:

- 1) The 65J12 Feeder is projected to be loaded above SN ratings in 2012 (103% of SN).
- 2) The 65J2 Feeder is projected to be loaded above SN ratings in 2013 (102% of SN).

Project Scope:

PLAN 1 - RECOMMENDED Plan. Upgrade 65J12 feeder utilizing a MITS design with a 3.75/4.68 MVA transformer. All feeder equipment has to be replaced because both the existing transformer & breaker are attached to a common metal-clad structure and cannot be split apart. This plan, along with the associated D-Sub project, will resolve all loading concerns at Clarke Street substation. Refer to attached Scope of Work document.

Project Alternatives Considered:

PLAN 2 - NOT Recommended. Install a MITS modular feeder in southern Jamestown. Company would need to purchase land to house this MITS. The estimated cost of this Plan is \$2.9M of which \$1M is assumed for the cost of land. A suitable parcel of land in Southern Jamestown to house this MITS is expected to be extremely difficult to located and the cost could much higher than the assumed \$1M. This plan is substantially more expensive and higher risk than the preferred plan.

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|---------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>2/23/2017 14:29:23</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

The Narragansett Electric Company
d/b/a National Grid
RIPUC Docket No. 4770
Attachment PUC 1-16-1 part 1 of 2
Page 560 of 889

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPlan Help Calc Print Win

Funding Project Estimates - Summary C046832 Current Total Authorized Amount: \$499,....

Title: CLARKE St Feeder Upgrades (D-Line)
Project Number: C046832

Budget Version Default (active)
Revision: v4
Revision Status: Approved
Revision No.: 6
Est Start Date: 03/18/2011
Est Complete Date: 06/01/2016
Est In Srvc Date: 02/28/2016
Capital: \$491,000.00
Expense: \$23,000.00
Jobbing: \$0.00
Retirement: \$0.00
Removal: \$38,000.00
Total (excl. Rets.): \$552,000.00
Credits: \$0.00
Net: \$552,000.00

Revision Info: Other Updates

Revision: 6 of 7
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from WO
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare
Close

Record 1 of 1
Audits



USSC Closure Paper

| | | | |
|---------------------------|--------------------------------|--------------------------|-----------------------------------------------------------|
| Title: | Clarke St 65J12 Feeder Upgrade | Sanction Paper #: | USSC-12-085 v5C |
| Project #: | C046831, C046832 | Sanction Type: | Closure |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 2/14/17 |
| Author: | David P. Arthur | Sponsor: | Carol Sedewitz, Vice President, Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | David P. Arthur |

1 Executive Summary

This paper is presented to close C046831 and C046832. The total spend was \$2.725M. The latest sanctioned amount for this project was \$2.894M with a tolerance of +/-10%.

The final spend amount is \$2.725M broken down into:

\$2.598 Capex

\$0.038 Opex

\$0.089 Removal

2 Project Summary

This project was required to address reliability concerns on the Island of Jamestown. The concerns addressed in this area were, that the two Clarke Street substation feeders were highly utilized and by 2014 loading on the 65J2 was projected to exceed summer normal ratings. Additionally, the Clarke Street 652 transformer, which supplied the 65J12 feeder, was on the Highly Utilized Transformer list for approximately ten years and had deteriorated transformer insulation. Also, there were signs of oil leaks inside the transformer compartment. Lastly, the 65J12 breaker was recommended for replacement due to asset condition concerns.

To resolve these concerns the recommended plan was to upgrade the Clarke Street 65J12 feeder, transformer and breaker. This investment resolved the projected overloads on Clarke Street feeders and addressed the asset condition concerns.

3 Over / Under Expenditure Analysis



USSC Closure Paper

3.1 Summary Table

| Actual Spending (\$M) | | | |
|-----------------------|-------------------------------------|---------|-------------|
| Project # | Description | | Total Spend |
| C046831 | CLARKE 65J12 Feeder Upgrade (D-Sub) | Capex | 2.173 |
| | | Opex | 0.015 |
| | | Removal | 0.038 |
| | | Total | 2.226 |
| Project # | Description | | Total Spend |
| C046832 | CLARKE St Feeder Upgrades (D-Line) | Capex | 0.425 |
| | | Opex | 0.023 |
| | | Removal | 0.051 |
| | | Total | 0.499 |
| | | | |
| Total | | Capex | 2.598 |
| | | Opex | 0.038 |
| | | Removal | 0.089 |
| | | Total | 2.725 |

| Project Sanction Summary Table | | | |
|---------------------------------|--|----------------|-------------|
| Project Sanction Approval (\$M) | | | Total Spend |
| | | Capex | 2.519 |
| | | Opex | 0.022 |
| | | Removal | 0.098 |
| | | Total Cost | 2.639 |
| Sanction Variance (\$M) | | | Total Spend |
| | | Capex | (0.079) |
| | | Opex | (0.016) |
| | | Removal | 0.009 |
| | | Total Variance | (0.086) |

3.2 Analysis

The project was completed within the allowed budget. Additional landscaping mitigation at the station was required as a result of neighborhood outreach. This increased the cost of the overall project, however the final cost is within the estimate tolerance.

4 Improvements / Lessons Learned

Ensure that project risk or estimate includes costs for landscaping improvements and EMF analysis if the station is located within a residential area.

5 Closeout Activities

The following closeout activities have been completed.

USSC Closure Paper



| Activity | Completed |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| All work has been completed in accordance with all National Grid policies | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All relevant costs have been charged to project | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All work orders and funding projects have been closed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All unused materials have been returned | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All as-builts have been completed | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |
| All lessons learned have been entered appropriately into the lesson learned database | <input checked="" type="radio"/> Yes <input type="radio"/> N/A |

6 Statements of Support

6.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-----------------------------|----------------------|---------------------------------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to 5-year business plan or emergent work |
| Resource Planning | Anne Wyman | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Resource Planning | Mark Phillips | Endorses construction resources, cost estimate, schedule, and portfolio alignment |
| Asset Management / Planning | Alan T. Labarre | Endorses scope, estimate, and schedule with the company's goals, strategies, and objectives |
| Engineering and Design | Suzan E. Martuscello | Endorses scope, design, conformance with design standards |
| Engineering and Design | Leonard G. Swanson | Endorses scope, design, conformance with design standards |

USSC Closure Paper



| | | |
|-----------------------------|------------------|---------------------------------------------|
| Project Management | Andrew Schneller | Endorses resources, cost estimate, schedule |
| Electric Project Estimation | Dan Marceau | Endorses cost estimate |

6.2 Reviewers

The reviewers have provided feedback on the content/language of the paper.



| Function | Individual |
|-------------------------|----------------|
| Finance | Richard Helm |
| Finance | Mark Collison |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegate | Jim Patterson |

USSC Closure Paper



7 Decisions

I approve this paper.

Signature..........Date..........
Chris Kelly, Senior Vice President, Electric Process & Engineering

C047377

IRURD Wethersfield Commons

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C047377</u> | USSC #: <u>USSC-16-150</u> |
| Revision: <u>3</u> | Budget Version: <u>Default</u> |
| Project Title: <u>IRURD Wethersfield Commons</u> | |
| Project Description: Replace 6000' of three-phase URD cable supplying three-phase load off P.20 and P.21 Spooner Ave in Warwick, RI. | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>open</u> | |
| Responsible Person: <u>RICHARD, JOHN</u> | Initiator: <u>Cerulli III, John</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>17</u> |

Project Schedule / Expenditures

| | | | | | |
|-----------------------------------------------|--------------------------------------------|-----------------------|-----------------------|---------------------|-----------------------|
| Revision Status: <u>Approved</u> | | | | | |
| Est Start Date: <u>4/1/2013</u> | Est Complete Date: <u>1/31/2019</u> | | | | |
| Est In-Service Date: <u>11/30/2018</u> | | | | | |
| TTD Actuals: <u>\$1,227,151</u> | As Of: <u>10/3/2017</u> | | | | |
| Cost Breakdown | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> |
| | <u>\$1,624,000</u> | <u>\$163,000</u> | <u>\$76,000</u> | <u>\$1,863,000</u> | <u>\$0</u> |

Justification / Risk Identification:

This URD has experienced five URD cable related outages in three years and meets the criteria for the URD/UCD cable strategy.

Project Scope:

This project replaces the older portion of the URD where the known faults have occurred including 6,000' of three-phase URD supplying three-phase load.

Project Alternatives Considered:

Injection was considered but rejected for higher cost (\$660,000) and greater risk.

Additional Notes:

<Enter data here>

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|------|--------------------------|----------|---------------|----------------------|
| Line 1: | Date | <u>4/1/2016 08:00:52</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C047377 Current Total Authorized Amount: \$1,86...

Title IRURD Wethersfield Commons
Project Number C047377

Budget Version Default (active)
Revision 16-150
Revision Status Approved
Revision No. 3
Est Start Date 04/01/2013
Est Complete Date 01/31/2019
Est In Srv Date 11/30/2018
Capital \$1,624,000.00
Expense \$163,000.00
Jobbing \$0.00
Retirement \$0.00
Removal \$76,000.00
Total (excl. Rets.) \$1,863,000.00
Credits \$0.00
Net \$1,863,000.00

Revision Info Other Updates

Revision 3 of 3
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from W/O
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close



Resanction Request

| | | | |
|---------------------------|-------------------------------|--------------------------|---------------------------------------------|
| Title: | IRURD Wethersfield URD | Sanction Paper #: | USSC-16-150 |
| Project #: | C047377 | Sanction Type: | Resanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 03/22/16 |
| Author: | John P. Richard, Jr. | Sponsor: | John Gavin, VP of Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | John P. Richard, Jr. |

1 Executive Summary

This paper requests the resanction of **C047377** in the amount **\$1.863M** with a tolerance of +/- 10% for the purposes of Engineering, Procurement and full construction including underground cable replacement.

This sanction amount is **\$1.863M** broken down into:

\$1.624M Capex
\$0.163M Opex
\$0.076M Removal

Note the originally requested sanction amount of \$0.600M

2 Resanction Details

2.1 Project Summary

Wethersfield URD in Warwick, RI has direct buried cable that experienced five cable faults within a three year period. The project will replace approximately 11,000' of direct-buried three phase URD cable. The project will be constructed in phases; Phase I will replace approximately 6,000' of three phase cable, Phase II will replace approximately 5,000' of three-phase cable.

2.2 Summary of Projects

| Project Number | Project Type (Elect only) | Project Title | Estimate Amount (\$M) |
|----------------|---------------------------|--------------------|-----------------------|
| C047377 | D-Line | IRURD Wethersfield | 1.863 |
| Total | | | 1.863 |



Resanction Request

2.3 Prior Sanctioning History

Previously approved sanctions are attached and listed below (Newest to Oldest).

| Date | Governance Body | Sanctioned Amount | Potential Project Investment | Paper Title | Sanction Type | Paper Reference Number | Tolerance |
|----------|----------------------|-------------------|------------------------------|--------------------|---------------|------------------------|-----------|
| 01/11/13 | Powerplant DOA (<1M) | \$0.600M | \$0.600M | IRURD Wethersfield | Sanction | | +/-10% |

Over / Under Expenditure Analysis

| Summary Analysis (\$M) | Capex | Opex | Removal | Total |
|------------------------|--------|--------|---------|--------|
| Resanction Amount | 1.624M | 0.163M | 0.076M | 1.863M |
| Latest Approval | 0.531M | 0.048M | 0.021M | 0.600M |
| Change* | 1.093M | 0.115M | 0.055M | 1.263M |

*Change = (Re-sanction – Amount Latest Approval)

2.4 Cost Summary Table

| Project Number | Project Title | Project Estimate Level (%) | Spend (\$M) | Prior Yrs | Current Planning Horizon | | | | | | Total |
|------------------------|--------------------|----------------------------|-------------|-----------|--------------------------|---------|---------|---------|---------|---------|-------|
| | | | | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| | | | | | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | |
| CD47377 | IRURD Wethersfield | Est Lvl (e.g. +/- 10%) | CapEx | 0.830 | 0.050 | 0.000 | 0.744 | 0.000 | 0.000 | 0.000 | 1.624 |
| | | | OpEx | 0.075 | 0.000 | 0.000 | 0.088 | 0.000 | 0.000 | 0.000 | 0.163 |
| | | | Removal | 0.032 | 0.000 | 0.000 | 0.044 | 0.000 | 0.000 | 0.000 | 0.076 |
| | | | Total | 0.937 | 0.050 | 0.000 | 0.876 | 0.000 | 0.000 | 0.000 | 1.863 |
| Total Project Sanction | | | CapEx | 0.830 | 0.050 | 0.000 | 0.744 | 0.000 | 0.000 | 0.000 | 1.624 |
| | | | OpEx | 0.075 | 0.000 | 0.000 | 0.088 | 0.000 | 0.000 | 0.000 | 0.163 |
| | | | Removal | 0.032 | 0.000 | 0.000 | 0.044 | 0.000 | 0.000 | 0.000 | 0.076 |
| | | | Total | 0.937 | 0.050 | 0.000 | 0.876 | 0.000 | 0.000 | 0.000 | 1.863 |



Resanction Request

2.5 Business Plan

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|---------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|
| FY17-FY21 Narragansett Electric Distribution Business Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> N/A | \$0.000M |

2.6 Drivers

2.6.1 Detailed Analysis Table

The following table indicates the major key variations that account for the difference between the original sanction amount and the requested resanction amount.

| Detail Analysis (M's) | Over/Under Expenditure? | Amount |
|-----------------------------------|-------------------------------------------------------------------------|----------|
| Updated Project Scope Information | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.387M |
| Addition of Phase II | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.876M |

2.6.2 Explanation of Key Variations

Updated Project Scope Information- The original estimate of \$0.600M was calculated in 2013 when the job was approved. The design has since been finalized, which allows the work to be estimated with more detail. The additional cost of \$0.387M is a result of having a final design to estimate the cost for construction.

Addition of Phase II

In April 2013, the scope of this project was expanded to include Phase II. Phase II will replace 5,000' of three phase direct-buried URD cable. The additional cost of \$0.876M is the anticipate cost to replace the additional 5,000'.



Resanction Request

2.7 If cost > approved Business Plan how will this be funded?

Reallocation of funds within the URD rehabilitation Program portfolio will be managed by Resource Planning to meeting jurisdictional, budgetary, statutory and regulatory requirements.

2.8 Key Milestones

| Milestone | Target Date: (Month/Year) |
|--------------------------------------------------|---------------------------|
| Planning Sanction | 01/2013 |
| Start Preliminary Engineering (kick-off meeting) | 03/2013 |
| Engineering Design Complete Phase I-EDC | 12/2014 |
| Construction Start Phase I | 09/2015 |
| Project Resanction | 03/2016 |
| Construction Completed Phase I - CC | 05/2016 |
| Engineering Design Complete Phase II-EDC | 12/2016 |
| Construction Start Phase II | 04/2018 |
| Construction Completed Phase II - CC | 11/2018 |
| Project Closure | 01/2019 |

2.9 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| January 2019 | Closure Paper |

3 Statements of Support

3.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-------------------------------|--------------|---------------------------------------------------------------------|
| Investment Planning | Glen Diconza | Endorses relative to distribution 5-year plan or emergent work |
| Resource Planning | Anne Wyman | Endorses Resources, cost estimate, schedule and Portfolio Alignment |
| Distribution Asset Management | Alan Labarre | Endorses scope, design, conformance with design standards |



Resanction Request

3.2 Reviewers


The reviewers have provided feedback on the content/language of the paper

| Function | Individual |
|--------------------------|----------------|
| Finance | Keith Fowler |
| Regulatory | Peter Zschokke |
| Jurisdictional Delegates | Jim Patterson |
| Procurement | Art Curran |
| Control Center | Mike Gallagher |



Resanction Request

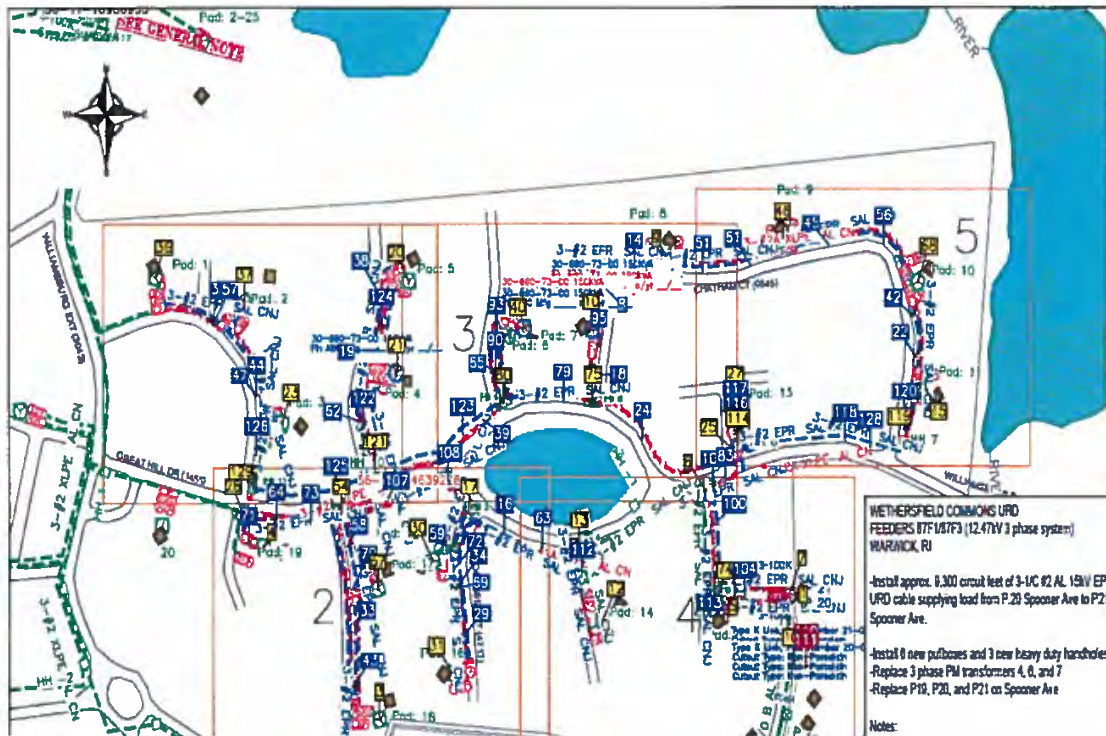
4 Decisions

| | |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| I: | |
| (a) | APPROVE this paper and the investment of \$1.863M and a tolerance of +/- 10% |
| (b) | NOTE that John P. Richard, Jr. is the Project Manager and has the approved financial delegation. |
| Signature..... |  |
| | Date..... <u>3/30/16</u> |
| Marie Jordan, Senior Vice President – Electric Process & Engineering | |

Resanction Request

nationalgrid

5 Appendices



C047396

IRURD Silver Maple Drive

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C047396</u> | USSC #: - |
| Revision: <u>3</u> | Budget Version: <u>Default</u> |
| Project Title: <u>IRURD Silver Maple Drive</u> | |
| Project Description: Partial replacement of 1000' of three-phase and single-phase URD supplied off P. 19 Club House Road in Coventry, RI. | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>CURLEY, JOSEPH</u> | Initiator: <u>Cerulli III, John</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>17</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|--------------|----------------|------------------|----------------|-----------------|------------------|------------|
| Est Start Date: <u>4/10/2013</u> | Est Complete Date: <u>10/24/2014</u> | | | | | | | | | | |
| Est In-Service Date: <u>10/24/2014</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$277,797</u> | As Of: <u>10/3/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$219,000</u></td> <td><u>\$9,000</u></td> <td><u>\$72,000</u></td> <td><u>\$300,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$219,000</u> | <u>\$9,000</u> | <u>\$72,000</u> | <u>\$300,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$219,000</u> | <u>\$9,000</u> | <u>\$72,000</u> | <u>\$300,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

This URD received three cable related outages in three years and meets the criteria for the URD/UCD Cable Program. Proposed work will replace all cable that has failed in last five years.

Project Scope:

Replace 1000' of three-phase and single-phase cable from riser pole P.19 Club House Road to Vault 5 Juniper Hill Drive and to Vault 3 Silver Maple Drive, including replacing four vaults with padmount transformers.

Project Alternatives Considered:

Complete URD replacement was considered at a total project cost of \$970,000.
Entire URD is 9,700'

Additional Notes:

Re-Sanction from \$160K to \$300K. Document attached. An additional 500' of feet of cable replacement was added to the scope resulting in an addition 140 in Labor and Labor Overheads bringing the total project cost to 300K.

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|-------------|---------------------------|-----------------|------------------------|-------------------------------|
| Line 1: | Date | <u>2/20/2015 13:00:07</u> | Approver | <u>curljo</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date | <u>2/24/2015 07:44:23</u> | Approver | <u>Diconza, Glen L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date | <u>2/25/2015 14:34:52</u> | Approver | <u>Constable, Ryan</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date | <u>3/9/2015 11:22:24</u> | Approver | <u>Cox, Roger D</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date | <u>3/12/2015 11:05:48</u> | Approver | <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C047396 Current Total Authorized Amount: \$300,000.00

Title IRURD Silver Maple Drive
Project Number C047396

Budget Version Default (active)

Revision RSN Form
Revision Status Approved
Revision No. 3
Est Start Date 04/10/2013
Est Complete Date 10/24/2014
Est In Srvc Date 10/24/2014
Capital \$219,000.00
Expense \$9,000.00
Jobbing \$0.00
Retirement \$0.00
Removal \$72,000.00
Total (excl. Rets.) \$300,000.00
Credits \$0.00
Net \$300,000.00

Revision Info Other Updates

Revision 3 of 3
[Find Revision](#)
☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from WO
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Change in DOA Request Form **(Less than Million)**

Version 9.0

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Electric - Janice Flynn

| | |
|--------------------------|-------------------------------|
| * Date: | 2/13/2014 |
| * Operating Company: | The Narragansett Electric Co. |
| * PowerPlant Project Id: | C047396 |
| * Project Name: | IRURD Silver Maple Drive |
| * Project Engineer: | Chris Montalto |
| * Project Manager: | John Richard |

Latest Project Estimate

| | |
|----------------------------|----------|
| * Date of Latest Sanction: | 4/5/2013 |
|----------------------------|----------|

| Total | Capex | Opex | Removal |
|-----------|-----------|---------|----------|
| \$160,000 | \$116,800 | \$4,800 | \$38,400 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|---------|----------|
| \$300,000 | \$219,000 | \$9,000 | \$72,000 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-------|------|---------|
| \$0 | | | |

| Current FY | Capex | Opex | Removal |
|------------|-----------|---------|----------|
| \$300,000 | \$219,000 | \$9,000 | \$72,000 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| | |
|--|--|
| | |
|--|--|

Reason for Revision

| | |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process <div style="text-align: right;">New Project Estimated Completion Date: </div> |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|-------------------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending **(Please expand the row height if box doesn't fit)**

| | |
|-------------------------------------|--------------------------------------------|
| <input checked="" type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|-------------------------------------|--------------------------------------------|

Change in DOA Request Form (Less than Million)

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Additional 500 feet of cable to be replaced. |
| <input type="checkbox"/> | Resource Allocation (Schedule, Delay, OT, or Contractor) |
| <input checked="" type="checkbox"/> | Low/High Estimate An additional 500' of feet of cable replacement was added to the scope resulting in an addition 140 in Labor and Labor Overheads bringing the total project cost to 300K. |
| <input checked="" type="checkbox"/> | External Forces (Permitting Requirements, Weather, Contractor Issues, etc) |

In-service Dates

*Original In-service Date: 3/31/2014
*Revised In-service Date: 10/24/2014

C047397

IRURD Cedarhurst.

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPPlan Help Calc Print Win

Funding Project Estimates - Summary C047397 Current Total Authorized Amount: \$575,000.00

Title IRURD Cedarhurst.
Project Number C047397

Budget Version No Assigned Versions

Revision RSN Form v2
Revision Status Approved
Revision No. 3
Est Start Date 04/01/2013
Est Complete Date 10/16/2014
Est In Srvc Date 10/16/2014
Capital \$494,500.00
Expense \$11,500.00
Jobbing \$0.00
Retirement \$0.00
Removal \$69,000.00
Total (excl. Rets.) \$575,000.00
Credits \$0.00
Net \$575,000.00

Revision Info Other Updates

Revision 3 of 3
Find Revision
Send for Approval

☐ Show 'Budget Only' Revisions

Spending Estimates:
Grid Estimates
Forecast
Summarize from WO
Copy Estimate

Property Estimates:
Unit Estimates
Create As Built
Delete Used Estimates

Edit:
New Revision
Delete Revision
Update
Update With Actuals
Import Estimates

Other:
Revision Comments
Released Dollars
Substitution
Slide

Version Compare

Record 1 of 1

Audits

Close

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Fund Project Number: <u>C047397</u> | USSC #: - |
| Revision: <u>3</u> | Budget Version: |
| Project Title: <u>IRURD Cedarhurst.</u> | |
| Project Description: Replace 400' radial URD off of P.2 Gateway Road and inject 4400' looped URD off P.3 Fishing Cove Road in North Kingstown, RI. | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>RICHARD, JOHN</u> | Initiator: <u>Cerulli III, John</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>17</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------------------|----------------|--------------|----------------|------------------|-----------------|-----------------|------------------|------------|
| Est Start Date: <u>4/1/2013</u> | Est Complete Date: <u>10/16/2014</u> | | | | | | | | | | |
| Est In-Service Date: <u>10/16/2014</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$547,172</u> | As Of: <u>10/3/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$494,500</u></td> <td><u>\$11,500</u></td> <td><u>\$69,000</u></td> <td><u>\$575,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$494,500</u> | <u>\$11,500</u> | <u>\$69,000</u> | <u>\$575,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$494,500</u> | <u>\$11,500</u> | <u>\$69,000</u> | <u>\$575,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

This URD has received three outages in three years and meets the criteria for the URD/UCD Cable Program.

Project Scope:

Replace 400' of radial URD off of P2 Gateway Road and inject or replace 4,400' of looped URD off of P3 Fishing Cove Road. Gateway shows looped in URD print and radial in GIS, exact scope to be determined by preliminary work order to perform underground survey.

Project Alternatives Considered:

Complete replacement considered at higher cost of \$260,000.

Additional Notes:

Re-Sanction from \$450K to \$575K. This project was completed as an emergency due to multiple faults on the line. The original scope of this project was to inject 4400' and replace 400' of cable, however in July 2014 there were three cable faults, two of them on injected cable, so the scope was expanded to replace the entire URD. It was decided to start construction on the increased scope without it being engineered, which resulted in the STORMS estimate being considerably lower than the actual cost of the project. The total footage of cable that was replaced was 5,200' which resulted in an additional \$2,500 in materials, \$4,500 in labor and \$400,000 in contractor charges, totaling the total

Related Projects:

Project Number:

Project Name:

Approvals

| | | | |
|----------------|---------------------------------------|----------------------------------------|-------------------------------|
| Line 1: | Date <u>2/12/2015 12:44:50</u> | Approver <u>curljo</u> | <u>DOA - Distribution Lev</u> |
| Line 2: | Date <u>2/17/2015 08:59:20</u> | Approver <u>Diconza, Glen L</u> | <u>DOA - Distribution Lev</u> |
| Line 3: | Date <u>2/17/2015 15:05:28</u> | Approver <u>Constable, Ryan</u> | <u>DOA - Distribution Lev</u> |
| Line 4: | Date <u>2/18/2015 16:02:14</u> | Approver <u>Cox, Roger D</u> | <u>DOA - Distribution Lev</u> |
| Line 5: | Date <u>3/13/2015 15:11:19</u> | Approver <u>LaBarre, Alan T</u> | <u>DOA - Distribution Lev</u> |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

Change in DOA Request Form **(Less than Million)**

Version 9.0

Note: Fill data in the grey area and email form to **Mario Carlino** and the appropriate IP analyst.

Gas - Tracy Nguyen

Electric - Janice Flynn

| | |
|-------------------------|-------------------------------|
| *Date: | 2/11/2015 |
| *Operating Company: | The Narragansett Electric Co. |
| *PowerPlant Project Id: | C047397 |
| *Project Name: | IRURD Cedarhurst |
| *Project Engineer: | Chris Montalto |
| *Project Manager: | John Richard |

Latest Project Estimate

| | |
|---------------------------|------------|
| *Date of Latest Sanction: | 12/10/2014 |
|---------------------------|------------|

| Total | Capex | Opex | Removal |
|-----------|-----------|---------|----------|
| \$450,000 | \$387,000 | \$9,000 | \$54,000 |

Revised Project Estimate

| Total | Capex | Opex | Removal |
|-----------|-----------|----------|----------|
| \$575,000 | \$494,500 | \$11,500 | \$69,000 |

Cash Flows

| Previous FY | Capex | Opex | Removal |
|-------------|-----------|---------|----------|
| \$125,000 | \$107,500 | \$2,500 | \$15,000 |

| Current FY | Capex | Opex | Removal |
|------------|-----------|---------|----------|
| \$450,000 | \$387,000 | \$9,000 | \$54,000 |

| FY+1 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

| FY+2 | Capex | Opex | Removal |
|------|-------|------|---------|
| \$0 | | | |

Customer Contribution

| | |
|--|--|
| | |
|--|--|

Reason for Revision

| | |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | Revised forecast either exceeds or is lower than the Approved Amount - Project Still In Process |
| | New Project Estimated Completion Date: |

| | |
|-------------------------------------|-------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Actual Spending either exceeds or is lower than the Approved Amount – Project is Complete |
|-------------------------------------|-------------------------------------------------------------------------------------------|

Reason for Increased Spending **(Please expand the row height if box doesn't fit)**

| | |
|--------------------------|--------------------------------------------|
| <input type="checkbox"/> | Change in Scope (Material, Labor or Other) |
|--------------------------|--------------------------------------------|

Change in DOA Request Form (Less than Million)

| | |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| <input type="checkbox"/> | Resource Allocation (Schedule, Delay, OT, or Contractor) |
| <input checked="" type="checkbox"/> | Low/High Estimate <p>This project was completed as an emergency due to multiple faults on the line. The original scope of this project was to inject 4400" and replace 400' of cable, however in July 2014 there were three cable faults, two of them on injected cable, so the scope was expanded to replace the entire URD. It was decided to start construction on the increased scope without it being engineered, which resulted in the STORMS estimate being considerably lower than the actual cost of the project. The total footage of cable that was replaced was 5,200' which resulted in an additional \$2,500 in materials, \$4,500 in labor and \$166,000 in contractor charges bringing the total project cost to \$575K.</p> |
| <input type="checkbox"/> | External Forces (Permitting Requirements, Weather, Contractor Issues, etc) |

In-service Dates

*Original In-service Date: 3/31/2014
 *Revised In-service Date: 10/16/2014

C047422

IRURD Maplewood

5360-Narragansett Electric and Gas Project Revision Detail Report

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Fund Project Number: <u>C047422</u> | USSC #: <u>USSC-13-322 v3</u> |
| Revision: <u>5</u> | Budget Version: <u>Default</u> |
| Project Title: <u>IRURD Maplewood</u> | |
| Project Description: Extend URD 600' to create loop and replace 4500' of three-phase URD off poles 226 and 228 Mendon Road in Cumberland, RI. | |

| | |
|---------------------------------------------------|-------------------------------------------------------------|
| Project Status: <u>Closed</u> | |
| Responsible Person: <u>RICHARD, JOHN</u> | Initiator: <u>Cerulli III, John</u> |
| Spending Rationale: <u>Asset Condition</u> | Funding Type: <u>P Electric Distribution Line RI</u> |
| Budget Class: <u>Asset Replacement</u> | |
| Capital by Category: | |
| Program Code: | |
| Project Risk Score: <u>36</u> | Project Complexity Score: <u>17</u> |

Project Schedule / Expenditures

| Revision Status: <u>Approved</u> | | | | | | | | | | | |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------|----------------|--------------|----------------|--------------------|-----------------|------------------|--------------------|------------|
| Est Start Date: <u>4/1/2013</u> | Est Complete Date: <u>9/30/2017</u> | | | | | | | | | | |
| Est In-Service Date: <u>6/30/2017</u> | | | | | | | | | | | |
| TTD Actuals: <u>\$1,531,701</u> | As Of: <u>10/3/2017</u> | | | | | | | | | | |
| Cost Breakdown | <table border="0" style="width: 100%;"> <tr> <th style="text-align: left;"><u>Capital</u></th> <th style="text-align: left;"><u>Expense</u></th> <th style="text-align: left;"><u>Removal</u></th> <th style="text-align: left;"><u>Total</u></th> <th style="text-align: left;"><u>Credits</u></th> </tr> <tr> <td><u>\$1,355,000</u></td> <td><u>\$78,000</u></td> <td><u>\$127,000</u></td> <td><u>\$1,560,000</u></td> <td><u>\$0</u></td> </tr> </table> | <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | <u>\$1,355,000</u> | <u>\$78,000</u> | <u>\$127,000</u> | <u>\$1,560,000</u> | <u>\$0</u> |
| <u>Capital</u> | <u>Expense</u> | <u>Removal</u> | <u>Total</u> | <u>Credits</u> | | | | | | | |
| <u>\$1,355,000</u> | <u>\$78,000</u> | <u>\$127,000</u> | <u>\$1,560,000</u> | <u>\$0</u> | | | | | | | |

Justification / Risk Identification:

This URD has been identified by Operations as receiving numerous part-power calls resulting from URD cable failure and meets the criteria for the URD/UCD Cable Strategy.

Project Scope:

Extend three-phase 600' from Vault10 to Pad 28. Replace 4500' of existing URD.

Project Alternatives Considered:

Partial injection was considered at an estimated cost of \$300,000. It was rejected for operational concerns regarding customer inconvenience and resulting confusing configuration of injected and replaced cables.

Additional Notes:

Related Projects:

Project Number:

Project Name:

Approvals

| | | | | | |
|---------|-------------|---------------------------|-----------------|---------------|----------------------|
| Line 1: | Date | <u>8/10/2016 11:29:17</u> | Approver | <u>carlim</u> | <u>USSC Approver</u> |
| Line 2: | Date | | Approver | | |
| Line 3: | Date | | Approver | | |
| Line 4: | Date | | Approver | | |
| Line 5: | Date | | Approver | | |

*****Project Authorization is for Approved Revision Total Estimated Cost +10%*****

REDACTED - CEII Information has been Redacted

PowerPlan ----- PPGPRD Database

File Edit Subsystem Batch Admin Preferences Window Help

Projects Assets Tables CR MyPPlan Help Calc Print Win

Funding Project Estimates - Summary C047422 Current Total Authorized Amount: \$1,56...

Title IRURD Maplewood

Project Number C047422

Budget Version Default (active)

Revision v3

Revision Status Approved

Revision No. 5

Est Start Date 04/01/2013

Est Complete Date 09/30/2017

Est In Srvc Date 06/30/2017

Capital \$1,355,000.00

Expense \$78,000.00

Jobbing \$0.00

Retirement \$0.00

Removal \$127,000.00

Total (excl. Rets.) \$1,560,000.00

Credits \$0.00

Net \$1,560,000.00

Revision Info Other Updates

Revision 5 of 5

Find Revision

Send for Approval

Show 'Budget Only' Revisions

Spending Estimates:

Grid Estimates

Forecast

Summarize from WO

Copy Estimate

Property Estimates:

Unit Estimates

Create As Built

Delete Used Estimates

Edit:

New Revision

Delete Revision

Update

Update With Actuals

Import Estimates

Version Compare

Other:

Revision Comments

Released Dollars

Substitution

Slide

Close

Record 1 of 32

Audits



Resanction Request

| | | | |
|---------------------------|-------------------------------|--------------------------|-------------------------------------------------|
| Title: | IRURD Maplewood | Sanction Paper #: | USSC-13-322 v3 |
| Project #: | C047422 | Sanction Type: | Resanction |
| Operating Company: | The Narragansett Electric Co. | Date of Request: | 8/2/16 |
| Author: | John P. Richard, Jr. | Sponsor: | Carol Sedewitz, VP of Electric Asset Management |
| Utility Service: | Electricity T&D | Project Manager: | John P. Richard, Jr. |

1 Executive Summary

This paper requests the resanction of **C047422** in the amount **\$1.560M** with a tolerance of +/- 10% for the purposes of Engineering, Procurement and full construction including underground cable replacement.

This sanction amount is **\$1.560M** broken down into:

\$1.355M Capex
\$0.078M Opex
\$0.127M Removal

Note the originally requested sanction amount of \$1.337M

2 Resanction Details

2.1 Project Summary

Maplewood URD in Cumberland, RI has 1970 vintage cross link polyethylene (XLPE) direct buried cable. As part of the URD Cable program, injection was considered, but input from Operations guided the final decision to forego injection. There is approximately 4,500' of three phase cable that will be replaced and 600' of cable will be installed to create a loop scheme.

2.2 Summary of Projects

| Project Number | Project Type (Elect only) | Project Title | Estimate Amount (\$M) |
|----------------|---------------------------|-----------------|-----------------------|
| C047422 | D-Line | IRURD Maplewood | 1.560 |
| Total | | | 1.560 |



Resanction Request

2.3 Prior Sanctioning History

Previously approved sanctions are attached and listed below (Newest to Oldest).

| Date | Governance Body | Sanctioned Amount | Potential Project Investment | Paper Title | Sanction Type | Paper Reference Number | Tolerance |
|---------|-----------------|-------------------|------------------------------|------------------|---------------|------------------------|-----------|
| 8/2/16 | USSC | \$1.337M | \$1.337M | IRURD Maplewoods | Sanction | USSC-13-322 v2 | +/-10% |
| 12/4/13 | USSC | \$0.400M | \$1.002M | n/a | Sanction | USSC-13-322 | +/-25% |

Over / Under Expenditure Analysis

| Summary Analysis (\$M) | Capex | Opex | Removal | Total |
|------------------------|--------|---------|---------|--------|
| Resanction Amount | 1.355M | 0.078M | 0.127M | 1.560M |
| Latest Approval | 1.159M | 0.110M | 0.068M | 1.337M |
| Change* | 0.196M | -0.032M | 0.059M | 0.223M |

*Change = (Re-sanction – Amount Latest Approval)

2.4 Cost Summary Table

| | | | | | Current Planning Horizon | | | | | | |
|------------------------|-----------------|----------------------------|-------------|-----------|--------------------------|---------|---------|---------|---------|---------|-------|
| Project Number | Project Title | Project Estimate Level (%) | | | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 | Yr. 6 + | |
| | | | | | | | | | | | |
| C047422 | IRURD Maplewood | Est Lvl (e.g. +/- 10%) | Spend (\$M) | Prior Yrs | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 | 2021/22 | Total |
| | | | CapEx | 1.164 | 0.191 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.355 |
| | | | OpEx | 0.068 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.078 |
| | | | Removal | 0.105 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.127 |
| Total | | | | 1.337 | 0.223 | 0.000 | 0.000 | 0.000 | 0.000 | 1.560 | |
| | | | | | | | | | | | |
| Total Project Sanction | | | CapEx | 1.164 | 0.191 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.355 |
| | | | OpEx | 0.068 | 0.010 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.078 |
| | | | Removal | 0.105 | 0.022 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.127 |
| | | | Total | 1.337 | 0.223 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 1.560 |



Resanction Request

2.5 Business Plan

| Business Plan Name & Period | Project included in approved Business Plan? | Over / Under Business Plan | Project Cost relative to approved Business Plan (\$) |
|-----------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|
| FY17-FY21 NE Electric Distribution Business Plan | <input checked="" type="radio"/> Yes <input type="radio"/> No | <input type="radio"/> Over <input type="radio"/> Under <input checked="" type="radio"/> N/A | \$0.000M |

2.6 Drivers

2.6.1 Detailed Analysis Table

The following table indicates the major key variations that account for the difference between the original sanction amount and the requested resanction amount.

| Detail Analysis (M's) | Over/Under Expenditure? | Amount |
|------------------------|-------------------------------------------------------------------------|----------|
| Streelight Replacement | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.063M |
| Civil Change Orders | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.091M |
| Capital Overheads | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.046M |
| Transportation | <input checked="" type="checkbox"/> Over <input type="checkbox"/> Under | \$0.023M |

2.6.2 Explanation of Key Variations

Streelight Replacement-There were existing company owned wooden pole streetlights located within Maplewoods URD. Many of these wooden poles had begun to rot through to the point that they had fallen over. Fallen streetlight poles are a safety hazard and also cause streetlight outages. In April 2016, it was decided that all of the existing streetlights should be replaced to prevent future failures. The cost to replace all existing wooden streetlight poles was \$0.063M

Civil Change Orders -The civil contractor was required to dig more test pits and use more hand digging than anticipated because of the layout of existing underground



Resanction Request

utilities. Test pits and hand digging are normal safety practices when excavating in an area that contains existing underground utilities. The cost for the change orders associated with test pits and hand digging was \$.091M

Capital Overheads- The decision to replace the existing wooden streetlights was made after the last time this project was sanctioned. The additional spend for the streetlights resulted in additional Capital Overhead charges. The additional cost of \$0.046M is a direct result of these unanticipated Capital Overhead charges.

Transportation Costs- The total transportation costs for this order exceeded the STORMS transportation estimate by \$0.23M.

2.7 If cost > approved Business Plan how will this be funded?

Reallocation of funds within the URD Rehabilitation Program portfolio will be managed by Resource Planning to meet jurisdictional, budgetary, statutory, and regulatory requirements.

2.8 Key Milestones

| Milestone | Target Date: (Month/Year) |
|--------------------------------------------------|---------------------------|
| Planning Sanction | 04/2013 |
| Start Preliminary Engineering (kick-off meeting) | 04/2013 |
| Engineering Design Complete-EDC | 06/2015 |
| Construction Start | 10/2015 |
| Project Resanction | 03/2016 |
| Project Resanction | 08/2016 |
| Construction Completed-CC | 06/2017 |
| Project Closure | 09/2017 |

2.9 Next Planned Sanction Review

| Date (Month/Year) | Purpose of Sanction Review |
|-------------------|----------------------------|
| September 2017 | Closure Paper |



Resanction Request

3 Statements of Support

3.1 Supporters

The supporters listed have aligned their part of the business to support the project.

| Department | Individual | Responsibilities |
|-------------------------------|-------------------|---------------------------------------------------------------------|
| Investment Planning | Glen DiConza | Endorses relative to distribution 5-year plan or emergent work |
| Resource Planning | Anne Wyman | Endorses resources, cost estimate, schedule and Portfolio Alignment |
| Distribution Asset Management | Alan Labarre | Endorses scope, design, conformance with design standards |

3.2 Reviewers

The reviewers have provided feedback on the content/language of the paper

| Function | Individual |
|-----------------|-------------------|
| Finance | Patricia Easterly |
| Regulatory | Peter Zschokke |
| Jurisdictional | Jim Patterson |
| Procurement | Art Curran |
| Control Center | Mike Gallagher |



Resanction Request

4 Decisions

I:

- (a) APPROVE this paper and the investment of \$1.560M and a tolerance of +/-10%
- (b) NOTE that John P. Richard, Jr. is the Project Manager and has the approved financial delegation.

Signature.....

A handwritten signature in blue ink, appearing to read "CKelly".

.....Date.....

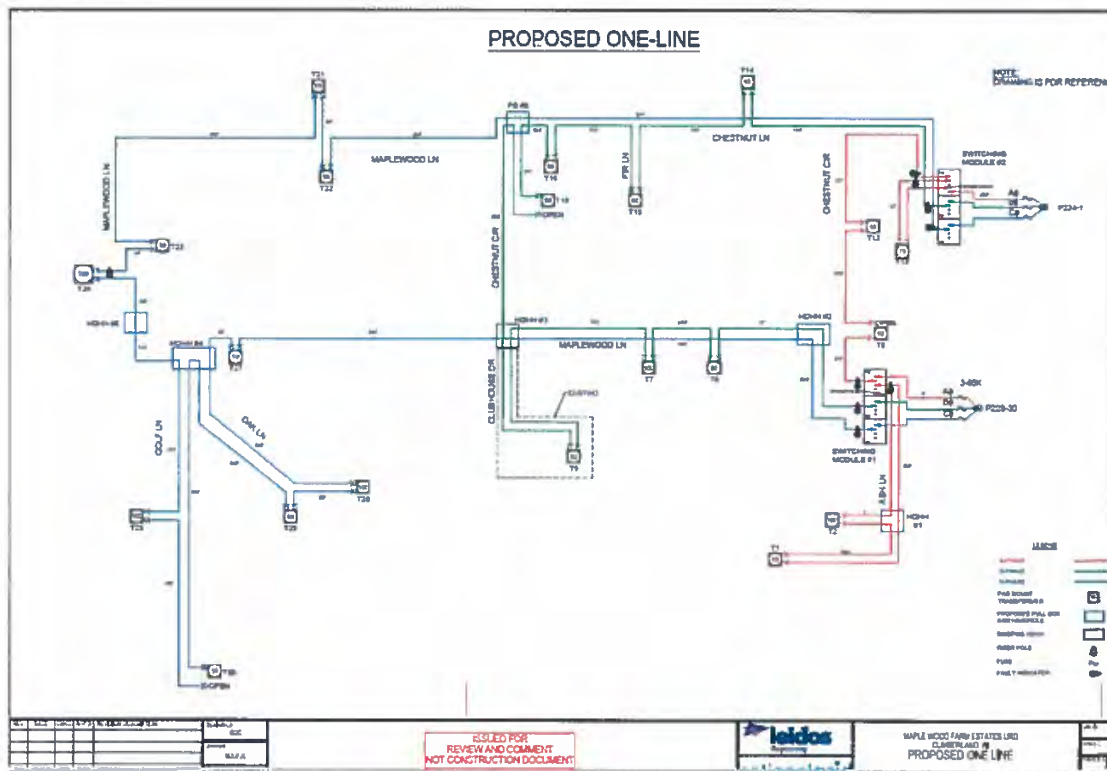
8/10/16

Christopher Kelly, Acting Senior Vice President – Electric Process & Engineering

Resanction Request



5 Appendices



C047495

DG SVC OCI Solar RI-233