

## Supplement Request Form

<b>Date Prepared:</b> 01/14/2021	<b>Project Title:</b> Install Pad Mount Step Route 13, Goffstown
<b>Company:</b> Eversource NH	<b>Project Number:</b> A20C24
<b>Organization:</b> Distribution Engineering	<b>Class(es) of Plant:</b> D Line
<b>Project Initiator:</b> Michael Warren	<b>Project Category:</b> Lines - General
<b>Project Manager:</b> Natacha Morales	<b>Project Type:</b> Specific
<b>Project Sponsor:</b> Marc Pilotte	<b>Capital Investment Part of Original Oper. Plan:</b> Yes
<b>Project Manager's Director:</b> Marc Geaumont	<b>O&amp;M Expenses Part of the Original Oper. Plan:</b> Yes
<b>Current Authorized Amount:</b> \$407K	<b>Estimated in service date:</b> 2/28/2021
<b>Supplement Request:</b> \$347.5K	<b>ISO-NE Approvals Required</b> (check all that apply): <input type="checkbox"/> PAC <input type="checkbox"/> TCA
<b>Total Request:</b> \$754.5K	

### Background

The pad-mounted step transformer project in Goffstown was approved by NH PAC and fully authorized in PowerPlan on June 24, 2020 for \$407K. This supplement request is for \$347.5K for a new total request of \$754.5K.

The project consists on the installation of a 5 MVA pad-mounted step transformer to off-load the parallel step transformers feeding the 3271X1 circuit at Route 13 in Goffstown. Two of the three parallel 500 kVA step banks exceed nameplate loading reaching 105% and 114% for summer 2019. The project also includes decommissioning and removal of six (6) existing 500 KVA steps, an easement purchase and installation of two new source-side DA protective devices (NOVA reclosers.)

The project has invested \$161K through January 15, 2021. The easement has been purchased, all permits have been secured and construction is ongoing as planned. The project is scheduled to be in service by the end of February 2021 with environmental restoration going through June of 2021.

### Supplement Justification Overview

This supplement request is driven by increased direct costs related to construction, surveying, engineering, environmental mitigation and commitments to landowner that were not part of the original estimate. Most of the increase is in the construction line item. The construction proposal used in the full funding PAF did not include all of the changes that took place after the site plans were developed.

### Supplement Justification Detail

The reasons for the project authorization supplement of \$347.5K are summarized below.

1. **ROW / Easements / Land Acquisition: \$0.4K** – Easement purchase charges total \$30,440. This included the wiring and title fees.

2. **Environmental Approvals / Permits: \$3K** – Environmental and Permitting services charges total \$29K, an increase of \$3K. The construction phase will be taking longer than what they had proposed for environmental monitoring.
3. **Engineering / Design: \$0.6K** – The forecast for internal engineering reviews is \$17.7K for the project. A full engineering/site plan development package was developed by a vendor for \$8.9K. All these charges total an increase of \$0.6K from original estimate.
4. **Materials (by Eversource): \$41.1K** – Retention oil system, pre-cast concrete pad and NOVA reclosers were higher than originally estimated.
5. **Construction: \$227.5K** – The forecast for the installation of poles, NOVA reclosers, line connections as well as testing of the new transformer is \$70K for the project (all internal resources). The construction vendor's proposal to complete the project is \$168,554. The proposal from the construction vendor that was used in the original estimate (\$58,250) was based on a preliminary sketch and did not fully include all the requirements that were agreed upon with the landowner/stakeholders in order to secure the easement. After the engineered drawings were complete and approved by the various stakeholders including the landowner, the construction scope increased. The increase includes more fill material to comply with Town approved plans including a new driveway, installation of the oil retention system, installation of a heated hut/tent to install the oil retention system due to winter conditions (previously not included), partial pavement of an access road to the easement and spring restorations. The original estimate included \$14.5K for tree clearing which is \$2K less than what was spent. The original estimate did not include surveying costs, the forecast for surveying costs is \$20.4K. The total for all construction tasks is \$275,454; an increase of \$227,454 from the original PAF.
6. **Project Management Team: \$10K** – Costs previously not estimated in the original PAF for construction and siting services, permitting services, real estate services and project management.
7. **Other (property taxes): \$1K** – Costs for property taxes were not included in the original PAF. The forecast for property taxed is \$1K.
8. **Risk (contingency): (\$38K)** – All contingency funds previously approved in the original PAF were utilized to cover for some of the increased actual costs, mainly the construction line item.
9. **Indirects/Overhead: \$97.6K** – The indirects are based on directs and the different rates that compose them. There is an increase in directs costs for construction mainly affecting the indirects. Forecast for indirects is \$228.6K.
10. **AFUDC: \$4.3K** – Small increase on rates, project is forecasting \$7.3K.

**Total Supplement Request: \$347.5K**

Please find a copy of the prior authorization document attached as reference.

## Supplement Cost Summary

The table below summarizes the line item categories from the original project estimates and the updated project estimates.

*Note: Dollar values are in thousands:*

Line item Category	Prior Authorized	New Total Request	Variance (Supplemental Request)
1. ROW / Easements / Land Acquisition	\$30	\$30.4	\$0.4
2. Environmental Approvals / Permits	\$26	\$29	\$3
3. Outreach	\$0	\$0	\$0
4. Siting Approvals / Permits	\$0	\$0	\$0
5. Engineering / Design	\$26	\$26.6	\$0.6
6. Materials (Eversource purchased)	\$105	\$146.1	\$41.1
7. Construction (incl matl's by contractors)	\$48	\$275.5	\$227.5
8. Testing / Commissioning	\$0	\$0	\$0
9. Project Mgmt Team	\$0	\$10	\$10
10. Removals	\$0	\$0	\$0
11. Other / Property Taxes	\$0	\$1	\$1
12. Risks (contingency)	\$38	\$0	(\$38)
<b>SUBTOTAL DIRECTS W/ RISKS</b>	<b>\$273</b>	<b>\$518.6</b>	<b>\$245.6</b>
13. Indirects/Overhead	\$131	\$228.6	\$97.6
14. AFUDC	\$3	\$7.3	\$4.3
<b>PROJECT TOTAL – BASELINE BUDGET</b>	<b>\$407</b>	<b>\$754.5</b>	<b>\$347.5</b>
15. Contingency	\$0	\$0	\$0
<b>TOTAL CAPITAL REQUEST</b>	<b>\$407</b>	<b>\$754.5</b>	<b>\$347.5</b>
16. Reimbursables/Customer Contribution	\$0	\$0	\$0
<b>PROJECT TOTAL (LESS REIMBURSABLES)</b>	<b>\$407</b>	<b>\$754.5</b>	<b>\$347.5</b>

### Total Supplement Request by Year

Note: Dollar values are in thousands:

Line item Category	Year 2021	Year 20__	Year 20__ +	Total
1. ROW / Easements / Land Acquisition	\$0.4	\$	\$	\$
2. Environmental Approvals / Permits	\$3	\$	\$	\$
3. Outreach	\$0	\$	\$	\$
4. Siting Approvals / Permits	\$0	\$	\$	\$
5. Engineering / Design	\$0.6	\$	\$	\$
6. Materials (Eversource purchased)	\$41.1	\$	\$	\$
7. Construction (incl matl's by contractors)	\$227.5	\$	\$	\$
8. Testing / Commissioning	\$0	\$	\$	\$
9. Project Mgmt Team	\$10	\$	\$	\$
10. Removals	\$0	\$	\$	\$
11. Other / Property Taxes	\$1	\$	\$	\$
12. Risks (contingency)	(\$38)	\$	\$	\$
<b>SUBTOTAL DIRECTS W/ RISKS</b>	<b>\$245.6</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
13. Indirects/Overhead	\$97.6	\$	\$	\$
14. AFUDC	\$4.3	\$	\$	\$
<b>PROJECT TOTAL – BASELINE BUDGET</b>	<b>\$347.5</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
15. Contingency	\$0	\$	\$	\$
<b>TOTAL CAPITAL REQUEST</b>	<b>\$347.5</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>
16. Reimbursables/Customer Contribution	\$0	\$	\$	\$
<b>PROJECT TOTAL (LESS REIMBURSABLES)</b>	<b>\$347.5</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>

## Lessons Learned

Engineering must validate existing conditions prior to finalizing scope and launching detailed engineering.

A scope document should be developed as well as conceptual engineering prior to obtaining an accurate estimate for full funding. The Project Manager should be involved in the scope development and estimating process along with engineering.

A statement of work should be developed for contracts purposes. This statement of work will give the contractor(s) better understanding of the scope of work for the project.

### **Operations Project Authorization Form**

<b>Date Prepared:</b> 06/02/2020	<b>Project Title:</b> Install Pad Mount Step Route 13, Dunbarton
<b>Company/ies:</b> NH	<b>Project ID Number:</b> A20C24
<b>Organization:</b> Field Engineering	<b>Class(es) of Plant:</b> Distribution Line
<b>Project Initiator:</b> Michael Warren	<b>Project Category:</b> Peak Load/Capacity – Distribution Lines
<b>Project Manager:</b> Marc Pilotte	<b>Project Type:</b> Specific
<b>Project Sponsor:</b> Marc Pilotte	<b>Project Purpose:</b> Overloaded Parallel 500 kVA Steps
<b>Estimated in service date:</b> 12/15/2020	<b>If Transmission Project: PTF?</b> N/A
<b>Eng. /Constr. Resources Budgeted?</b> Y	<b>Capital Investment Part of Original Operating Plan?</b> Y
<b>Authorization Type:</b> Full Funding	<b>O&amp;M Expenses Part of the Original Operating Plan?</b> Y
<b>Total Request:</b> \$407,000	

**Financial Requirements:**

**Project Authorization**

ERM: \_\_\_\_\_

FP&A: \_\_\_\_\_

**Executive Summary**

This project is to install a 5 MVA pad-mounted step transformer to off-load the parallel step transformers feeding the 3271X1 circuit at Route 13 in Goffstown. Two of the three parallel 500 kVA step banks exceeded nameplate loading reaching 105% and 114% for summer 2019. This project was approved by CPAC in 2019 with an initial budget of \$75K for engineering, site evaluation and easement work. This request is for full financial approval.

## Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2019	2020	20__+	Totals
Capital Additions - Direct	\$ -	\$ -	\$ 273	\$ -	\$ 273
Less Customer Contribution	-	-	-	-	-
Removals net of Salvage ____%	-	-	-	-	-
Total - Direct Spending	\$ -	\$ -	\$ 273	\$ -	\$ 273
Capital Additions - Indirect	-	-	131	-	131
Subtotal Request	\$ -	\$ -	\$ 404	\$ -	\$ 404
AFUDC	-	-	3	-	3
Total Capital Request	\$ -	\$ -	\$ 407	\$ -	\$ 407
O&M	-	-	-	-	-
Total Request	\$ -	\$ -	\$ 407	\$ -	\$ 407

## Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	Year 1	Year 2	Year 3+	Total
Straight Time Labor	26			
Overtime Labor				
Outside Services	104			
Materials	105			
Other, including contingency amounts (describe)	38			
<b>Total Direct Costs</b>	<b>273</b>			
Indirect Capital Costs	Year 1	Year 2	Year 3+	Total
Indirects/Overheads (including benefits)	131			
Capitalized interest or AFUDC, if any	3			
<b>Total Indirect Costs</b>	<b>134</b>			
<b>Total Capital Costs</b>	<b>407</b>			
Less Total Customer Contribution				
<b>Total Capital Project Costs</b>	<b>407</b>			
<b>Total O&amp;M Project Costs</b>				

Note: "Other" category consists of easement costs as well as contingency cost for various additional costs for installing pad-mount step transformer (oil retention and or site work). The above evaluation does not include \$66K for the actual purchase of the pad-mount step transformer because it is a precapitalized item.

**Future Financial Impacts:**

Provide below the estimated future costs that will result from the project:

*Note: Dollar values are in thousands:*

<b>Future Costs</b>	<b>Year 20__</b>	<b>Year 20__</b>	<b>Year20__</b>	<b>Year 20__+</b>	<b>Total Future Project Costs</b>
Capital	\$ -	\$ -	\$ -	\$ -	\$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
<b>TOTAL</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

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

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

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

Provide below the estimated financial benefits that will result from the project:

*Note: Dollar values are in thousands:*

<b>Future Benefits</b>	<b>Year 20__</b>	<b>Year 20__</b>	<b>Year20__</b>	<b>Year 20__+</b>	<b>Total Future Project Benefits</b>
Capital	\$ -	\$ -	\$ -	\$ -	\$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
<b>TOTAL</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

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

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

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

Is there an ARO associated with this project? No

Are there other environmental cleanup costs associated with this project? No

## **Technical Justification**

### **Project Need Statement**

This project installs a 5 MVA pad-mounted step transformer to replace the parallel step transformers on the 3271X1 circuit at Route 13 (Pattee Hill Road) in Goffstown. Two of the three parallel banks exceeded nameplate value during the summer of 2019. Phase A reached 105% and Phase C reached 114% of nameplate value.

### **Project Objectives**

Off-load overloaded step transformers on Pattee Hill Road by replacing the steps with a 5 MVA pad-mounted step. Solution addresses over loaded step transformers, bringing all phases to less than 70% of nameplate value rating of the padmounted step. This solution addresses loading on the circuit for approximately 7 years when the #2 main line conductor is projected to reach 100% normal rating, using a 2% growth rate.

### **Project Scope**

Install one 19.9/34.5 kV to 7.2/12.47 kV, 5 MVA three phase pad-mounted step transformer and remove the six existing 500 KVA steps. Utilize existing load side 12.47 kV DA SCADA device. An easement or land purchase of \$30K to place the new transformer has been included in the cost estimate.

### **Background / Justification**

Eliminate overloaded step transformers on the 3271X1 circuit and attempt to load balance circuit off Route 13 Pattee Hill Road in Goffstown and Dunbarton. Two sets of parallel 500 KVA step transformers exceeded nameplate loading reaching 105% and 114% during summer of 2019. A new DA device installed prior to summer load showed loading as 105%, 72%, 114%. Load balancing to bring the other two phases under 100% was investigated, but loading is sparse along the main line except for a few large side taps. Moving these side taps will simply swap the over load from one phase to another.

The north end of the 3271X1 is single phase (phase B) which is the lowest loaded phase, so pulling off load to the north via an abutting circuit will not aid in off loading the step transformers. To the east is another utility.

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

- Addresses overloaded parallel 500 KVA step transformers.
- Addresses future load growth of 2% for 15.5 years based on the step transformers, and 6.5 years based on the existing #2 ACSR main line conductor normal summer ratings (190 amps).
- Leaves capacity for a potential 12 kV tie to the 37W1 circuit to the north.

### **Alternatives Considered with Cost Estimates**

**Alternative 1:** Reconductor and convert up Route 13 for 3.88 miles just beyond Gorham Pond Road (pole 13/217). Initial assessment by Designer shows having to replace or work on almost half the poles in this section. In addition, current standard is covered wire so the existing #2 ACSR would be replaced with 477 spacer cable. Addresses future loading on 1000 KVA steps for 8 years based on 2% load growth. Step loading (60%,35%,84%). No simple load balancing available. Estimated at \$2,412,000

**Alternative 2:** Reconductor and convert up Route 13 for 2 miles just beyond Paige Hill Road (pole 13/116). Initial assessment by Designer shows having to replace or work on almost half the poles in this section. In addition, current standard is covered wire so the existing #2 ACSR would be replaced with 477 spacer cable. Addresses future loading on 1000 KVA steps for 3 years based on 2% load growth. Step loading (94%, 94%,68%). All simple load balancing taken into account. Estimated at \$1,382,000



### Project Schedule

Milestone/Phase Name	Estimated Completion Date
Easement Process	07/01/2020
Engineering/Writing Complete	04/01/2020
Construction Begins	08/15/2020
Estimated In-Service Date	12/15/2020

### Regulatory Approvals

None.

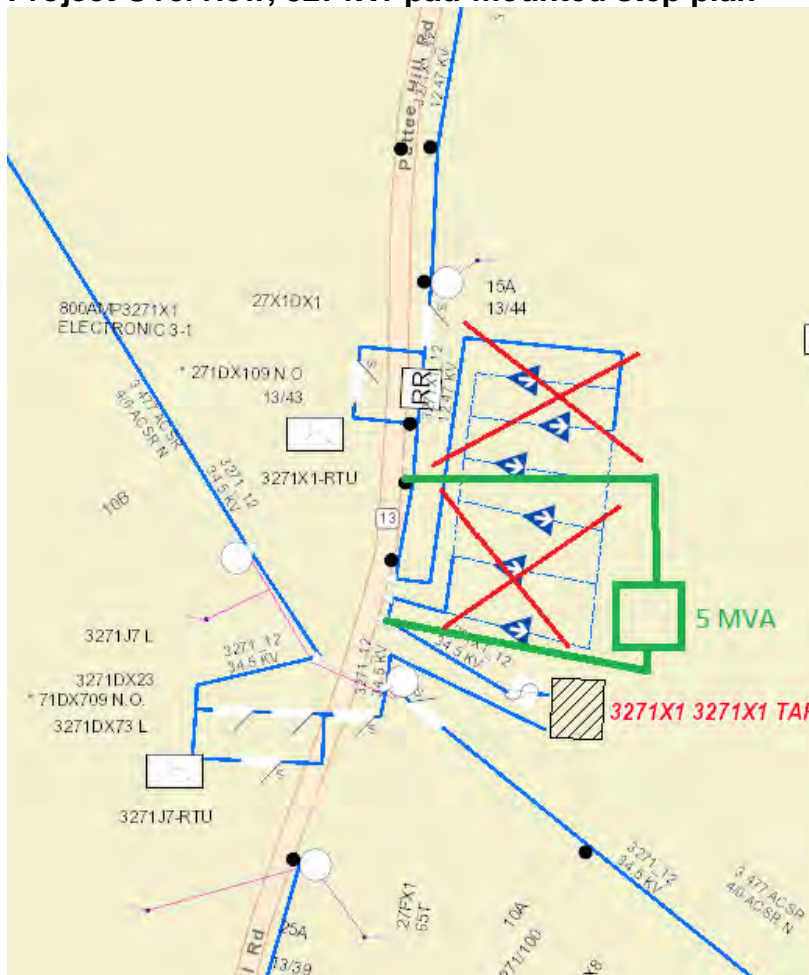
### Risks and Risk Mitigation Plans

Padmount step lead time – Anything beyond 7 months normal lead time may push completion time into winter of 2021. This is acceptable as 3271X1 circuit is a summer peaking circuit.

Easement rights – Failure to secure easement rights at the circuit tap will mean looking further down the circuit for potential locations or implementing an alternative solution. The customer has verbally agreed to the easement and the company is preparing the necessary paperwork.

### References

### Project Overview, 3271X1 pad-mounted step plan



### Map of pad mount site



### Cost Estimate Backup Details

Cost is based on STORMS estimate, WR number 3399076

Install pad-mounted step transformer – \$407K per site per Work Request estimate, which includes:

- Easement Purchase - \$30K
- Site Work - \$58K
- Environmental Permits - \$26K
- Crane - \$1300
- Flat Bed Truck - \$700

The estimate does not include the 5 MVA padmounted step transformer (\$66K) as this is precapitalized material.

## Initial Funding Request Form

<b>Date Prepared:</b> 12/24/2019	<b>Project Title:</b> Install Pad Mount Step Route 13, Goffstown
<b>Company/ies:</b> NH	<b>Project ID Number:</b> A20C24
<b>Organization:</b> Field Engineering	<b>Class(es) of Plant:</b> Distribution Line
<b>Project Initiator:</b> Michael Warren	<b>Project Category:</b> Peak Load/Capacity – Distribution Lines
<b>Project Sponsor:</b> Paul Renaud	<b>Project Type:</b> Specific
<b>Estimated in service date:</b> 12/15/2020	<b>Project Purpose:</b> Relieve overloaded parallel steps
<b>Authorization Type:</b> Initial Funding	<b>If Transmission Project:</b> PTF? n/a
<b>Total Request:</b> \$75,000	

### Project Need Statement

This project is to install a 5 MVA padmounted step transformer to replace the parallel step transformers on the 3271X1 circuit at Route 13 (Pattee Hill Road) in Goffstown. Two of the three parallel banks exceeded nameplate value during the summer of 2019. Phase A reached 105% and Phase C reached 114% of nameplate value.

### Project Objectives

Off-load overloaded step transformers on Pattee Hill Road by replacing the steps with a 5 MVA padmounted step transformer.

### Funding Request Explanation (amount, deliverables, schedule for full funding request):

This request is for initial funding for this project in order to allow for the acquisition of an easement to place a padmounted step transformer, preliminary site design for the unit location, and the development of an accurate estimate of the total project cost. The project will be handed over to the Project Management group to pursue these items. It is anticipated that the easement can be obtained by approximately April 1, 2020, depending on the willingness of the landowner to accommodate the request.

A full funding PAF will be submitted to the NH PAC when the costs of these items are known. Based on previous installations the total project is currently estimated at \$675,000, however site costs are still undetermined and are the reason for this Initial Funding Request.