

**Public Service of New Hampshire d/b/a Eversource Energy**  
**Docket No. DE 19-057**

**Date Request Received: 07/19/2021**

**Request No. RR 1-003**

**Request from: Department of Energy**

**Date of Response: 07/22/2021**

**Page 1 of 1**

**Witness: Lee G. Lajoie**

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**Request:**

Please identify any emergency projects included in the 2020 projects included in this step adjustment. To the extent there are such projects, please provide the supporting documentation for those projects.

**Response:**

For clarity, Eversource notes that absent something unknowable happening (such as when a vehicle hits a pole and damages capital assets that need to be replaced immediately for safety reasons), essentially every capital project, including those that might be referred to as "Emergency" projects, is planned to some extent. Even for "Emergency" projects, the Company will assure that provisions are implemented to assure continuity of service while the project to replace the failed piece of equipment is planned and executed. As an example, the Berlin substation transformer replacement project discussed during the hearing on July 19 was done on an emergency basis but still had significant planning to assure reliable service was maintained.

With that clarification, Eversource reviewed the projects included in Attachment LGL/DLP/JJD-1 in Exhibit 62 and identified one project that would qualify as an "Emergency" project - Project A20E43, East Northwood Regulator Replacement shown on Bates page 26 (in red) on line 41. This project involved the replacement of regulator controls that had failed in mid-2020 which led to voltage reductions affecting customers and outside the ranges permitted by Commission regulations. Given the age of the impacted regulators (approx. 60 years old), the regulators were replaced with new regulators and modern controls. A mobile substation was deployed to assure continuity of service while the replacements were installed. The PAF relating to this project is attached as Record Request 1-003 - Attachment 1.

**Operations Project Authorization Form****Approved at September 2, 2020 EPAC**[Link to Meeting Minutes](#)

Date Prepared: 09/08/2020	Project Title: East Northwood SS Regulator Replacement
Company: Eversource NH	Project Number: A20E43
Organization: Distribution Engineering	Class(es) of Plant: D SS
Project Initiator: Mike Busby	Project Category: Stations - Other
Project Manager: Thelma Brown	Project Type: Specific
Project Sponsor: Russel Johnson	Project Purpose: Replace the failed three phase 12.47kV regulator at East Northwood SS
Estimated in service date: 11/15/20	Capital Investment part of original Oper. Plan: No
Eng./Constr. Resources Budgeted? Yes	O&M Expenses part of original Oper. Plan: N/A
Authorization Type: Full Funding	Facility Type (check all that apply): <input type="checkbox"/> PTF <input type="checkbox"/> non-PTF <input checked="" type="checkbox"/> Distribution
Total Request: \$313K	

**Financial Requirements:****Project Authorization**

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

FP&amp;A: \_\_\_\_\_

**Executive Summary**

East Northwood SS in Northwood, NH is a 34.5-12.47kV substation with a 3,750kVA transformer, recloser, and regulator feeding the 63W1 circuit. The regulator controls have failed. In June the controls were stuck in voltage reduction, which resulted in low voltage for some customers and the down-line pole top regulators to operate at +16 setting. The regulator was then set at the neutral position. In 2016, some Distribution Automation equipment was added at East Northwood SS but the GEMLT-32 control on the three-phase regulator was not capable of being monitored for tap position.

Full funding of \$313K is requested for the replacement of the GE 60 year old three phase regulator with three (3) single phase Siemens regulators with Beckwith M-6200 controls. The regulators will be monitored and capable of being controlled by SCADA. This project was approved by the Solutions Design Committee at the 8/19/2020 meeting.



## Project Costs Summary

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2020 to Go	2021	2022	2023	2024	2025	Total
1. ROW / Easements / Land Acquisition	\$	\$	\$	\$	\$	\$	\$	\$	\$
2. Environmental Approvals / Permits	\$	\$	\$25	\$	\$	\$	\$	\$	\$25
3. Outreach	\$	\$	\$	\$	\$	\$	\$	\$	\$
4. Siting Approvals / Permits	\$	\$	\$	\$	\$	\$	\$	\$	\$
5. Engineering / Design	\$	\$	\$8	\$	\$	\$	\$	\$	\$8
6. Materials (Eversource purchased)	\$	\$	\$87	\$	\$	\$	\$	\$	\$87
7. Construction (incl mat'l's by contractors)	\$	\$	\$38	\$	\$	\$	\$	\$	\$38
8. Testing / Commissioning	\$	\$	\$1	\$	\$	\$	\$	\$	\$1
9. Project Mgmt Team	\$	\$	\$2	\$	\$	\$	\$	\$	\$2
10. Removals	\$	\$	\$2	\$	\$	\$	\$	\$	\$2
11. Other	\$	\$	\$1	\$	\$	\$	\$	\$	\$1
12. Risks	\$	\$	\$12	\$	\$	\$	\$	\$	\$12
<b>SUBTOTAL DIRECTS W/ RISKS</b>	<b>\$</b>	<b>\$</b>	<b>\$176</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$176</b>
13. Indirects/Overhead	\$	\$	\$121	\$	\$	\$	\$	\$	\$121
14. AFUDC	\$	\$	\$8	\$	\$	\$	\$	\$	\$8
<b>PROJECT TOTAL – BASELINE BUDGET</b>	<b>\$</b>	<b>\$</b>	<b>\$305</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$305</b>
15. Contingency	\$	\$	\$8	\$	\$	\$	\$	\$	\$8
<b>TOTAL CAPITAL REQUEST</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>
16. Reimbursables/Customer Contribution	\$	\$	\$	\$	\$	\$	\$	\$	\$
<b>PROJECT TOTAL (LESS REIMBURSABLES)</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>
O&M	\$	\$	\$	\$	\$	\$	\$	\$	\$
<b>TOTAL REQUEST</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

Other includes miscellaneous employee expenses and mileage (\$1K). Risk allocation includes potential for environmental remediation (\$12K).



## Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2020 to Go	2021	2022	2023	2024	2025	Total
ST Labor	\$	\$	\$49	\$	\$	\$	\$	\$	\$49
OT Labor	\$	\$	\$	\$	\$	\$	\$	\$	\$
Outside Services Labor	\$	\$	\$25	\$	\$	\$	\$	\$	\$25
Materials*	\$	\$	\$87	\$	\$	\$	\$	\$	\$87
Removals	\$	\$	\$2	\$	\$	\$	\$	\$	\$2
Other	\$	\$	\$21	\$	\$	\$	\$	\$	\$21
Indirects	\$	\$	\$121	\$	\$	\$	\$	\$	\$121
AFUDC	\$	\$	\$8	\$	\$	\$	\$	\$	\$8
<b>TOTAL CAPITAL REQUEST - W/O REIMBURSABLES</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$</b>	<b>\$313</b>

\*All materials including Eversource purchased and outside service purchased. Note that outside service purchased material included in construction in project cost summary above.



## Future Financial Impacts:

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

Note: Dollar values are in thousands

Future Costs	Year 20__	Year 20__	Year 20__	Year 20__ +	Total Future Project Costs
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:

N/A

What functional area(s) will these future costs be funded in? N/A

*A representative from the respective functional area is required to be included as a project approver.*

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

Note: Dollar values are in thousands

Future Benefits	Year 20__	Year 20__	Year 20__	Year 20__ +	Total Future Project Benefits
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:

N/A

What functional area(s) will these benefits be reflected in? N/A

*A representative from the respective functional area is required to be included as a project approver.*

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

Is there an ARO associated with this project? If yes, please provide details: No

Are there other environmental cleanup costs associated with this project? If yes, please provide details: An environmental assessment of the regulator foundation and surrounding soil will be completed to identify if soil/concrete remediation is required due to the potential presence of PCB oil contamination.



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## **Technical Justification:**

### **Project Need Statement**

East Northwood SS is a 34.5-12.47kV substation with a 3,750kVA transformer, recloser, and regulator feeding the 63W1 circuit. See Attachment A for the East Northwood SS One-Line diagram. The regulator controls have failed. In June the controls were stuck in voltage reduction, which resulted in low voltage for some customers and the down-line pole top regulators to operate at +16 setting. The regulator was then set at the neutral position. In 2016, some Distribution Automation equipment was added at East Northwood SS but the GEMLT-32 control on the three-phase regulator was not capable of being monitored for tap position.

New Hampshire Code of Administrative Rules PUC300 requires to customers be within 5% of the nominal voltage:

- *Part PUC 304.02 (c): A utility shall maintain the nominal secondary voltage at the utility's service terminals or at the street lamp in the case of multiple street lighting, as installed for each customer, within plus or minus 5% average RMS.*

Without automatic voltage regulation at the substation, customers are susceptible to voltages outside of the PUC300 mandated limits.

The Signal 60 radio control system is a 1970s vintage radio-based system used for voltage reduction. This system is being retired in NH as it is obsolete and replacement equipment is not available. The new systems are to provide full SCADA capability with the ESCC.

### **Project Objectives**

Replace the three-phase regulator that has a failed controller at East Northwood with three (3) single phase regulators with modern controllers.

### **Project Scope**

#### **Removals**

1. One (1) three phase 12.47kV GE 418A regulator
2. The existing regulator foundation
3. The existing recloser/regulator bypass switch 109
4. The Signal 60 system

#### **Additions**

1. Three (3) single phase 7.2kV 438A regulators with Beckwith M-6200 controllers
2. Steel support platform for regulators to be mounted on existing steel structure foundations that are set up for the new steel platform
3. Three (3) single phase fused disconnect switches
4. One (1) RTAC and associated communication cable in existing conduit to communicate with the new regulator controls. There is an existing SEL-RTU cabinet that will be used.
5. Animal protection on the bushings and taps to the regulator.



A mobile substation will be installed in order to deenergize the substation during construction.

The project scope includes an environmental assessment which is included in the base cost estimate for outside services. If remediation is required and soil/foundation removal is needed, these costs have been included in the risk allocation.

A constructability review was completed on August 13, 2020. See Attachment C for the completed review form.

### **Background / Justification**

The three phase 12.47kV regulator at East Northwood SS is 60 years old, as shown in the photograph below. The regulator controls have failed. Station Operations has recommended the replacement of this unit with three (3) 7.2kV regulators which is more common on the Eversource NH system. Much of the load on the substation is single phase so this solution is also preferred by Field Engineering.



Existing Three Phase Regulator at East Northwood SS

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

Replace obsolete equipment and automate regulation of system voltage to meet PUC300 requirements and increase reliability.



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## Alternatives Considered with Cost Estimates

### **Alternative 1 (This is the chosen solution)**

Replace the three-phase regulator with a failed controller at East Northwood with three (3) single phase regulators with modern controllers.

Estimated Cost: \$314K Planning grade estimate (-25%/+25%).

#### Advantages

1. This replaces obsolete and a unique three phase substation regulator with standard single-phase regulators.
2. This alternative allows for the ability to full SCADA control of the substation including replacing the Signal 60 voltage reduction controls.

#### Disadvantages

1. This alternative is costlier than just updating controls for the existing three phase regulator.

The project was presented to the Solution Design Committee and approved on August 19, 2020.

### **Alternative 2 (This is NOT the preferred solution)**

Replace the failed three phase regulator controller at East Northwood SS.

Estimated Cost: \$202K Conceptual grade estimate (-25%/+50%).

#### Advantages

1. This is a less costly alternative since it is only for replacing the controller, although the installation is unique and problematic.

#### Disadvantages

1. This alternative will not allow for the removal of Signal 60 as the tap position of the regulator cannot be readily obtained with this unit.
2. This alternative has been looked into in the past and there was no direct replacement available for the device.
3. This alternative does not address that the three-phase regulator is 60 years old, obsolete and unique to the system.





## Project Schedule

Milestone/Phase Name	Estimated Date
SDC Review of Preferred Solution	8/19/20
Full Funding request at EPAC	9/2/20
Order major materials	9/16/20
Construction Start	10/1/20
In Service Date	11/15/20

See Attachment D for the P6 schedule.

## Regulatory Approvals

None

## Risks and Risk Mitigation Plans

There is a risk and additional cost to the project for potential environmental remediation of the foundation and soil around the existing regulator.

- \$12K is included in the estimate for potential environmental remediation.

The mobile substation will be used to allow the substation to be deenergized during construction. This substation is currently subject to an SCLL under normal conditions. The use of the mobile will not increase exposure to SCLL conditions. The cost for the mobile installation is included in the cost estimate.

## Contingency

Estimating has included a contingency amount of 5% (\$8,210) in the estimate.

## References

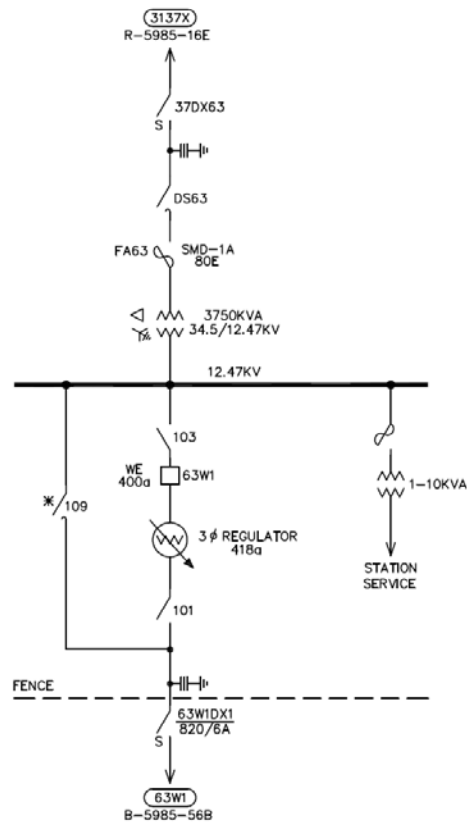
New Hampshire Code of Administrative Rules PUC300 - Part PUC 304.02 (c)  
A20E43 - East Northwood SS Regulator Replacement - Solution Selection Form

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

Attachment A - One-Line Diagram  
Attachment B - Backup Cost Estimate  
Attachment C - Constructability Review Form  
Attachment D - Project Schedule



## Attachment A - One-Line Diagram



LAST REVISION DETAIL  
UPDATE 63W1 CONNECTING PRINT

EVERSOURCE ENERGY			EASTERN	
NEW HAMPSHIRE				
EAST NORTHWOOD 37 ROCHESTER ROAD, NORTHWOOD, NH 942-7120				
DRN. WNT	CHKD. CAB	APPR. CEC	12/11/18	D-8850

**EVERSOURCE**  
Project Authorization Form**INSTRUCTIONS:**

It is the responsibility of the initiator to contact the subject matter experts in the listed area disciplines to determine if the project considerations contained in this list are applicable to their project. They should fill out the checklist and determine a transition plan for the purpose of project execution. See the PAF Guide for additional instruction.

<b>Project Checklist - Transmission &amp; Substation Capital Project</b>	
<b>Project Name: E. Northwood SS Regulator Replacement</b>	<b>Project Number: A20E43</b>
<b>Facility Type:</b> <input type="checkbox"/> BPS <input type="checkbox"/> BES <input type="checkbox"/> PTF <input type="checkbox"/> non-PTF <input type="checkbox"/> CIP <input checked="" type="checkbox"/> Distribution	
<b>PLANNING</b>	
Is a NX-9 required?	<u>No</u>
Is an ISO-NE PAC presentation required?	<u>No</u>
ISO-NE Presentation Date (if completed):	<u>Enter Date</u>
Cost in ISO-NE Presentation (\$M) (if completed):	<u>Enter Cost (\$M)</u>
Is a PPA required?	<u>No</u>
Is a TCA Application Required?	<u>No</u>
TCA Submittal Date (if submitted):	<u>Enter Date</u>
Cost in TCA Submittal (\$M) (if submitted):	<u>Enter Cost (\$M)</u>
Enter ISO-NE RSP / Asset Condition ID, if assigned:	<u>Enter ISO-NE ID</u>
<b>PLANNING/PROTECTION &amp; CONTROLS</b>	
Are RAS/SPS/UVLs affected?	<u>No</u>
<b>OPERATIONS</b>	
Outage Required?	<input checked="" type="checkbox"/> Primary Equipment (Power Transfer) <input type="checkbox"/> Secondary Equipment (P&C only) <input type="checkbox"/> Outage Not Required
Do SCLL Conditions Exist?	<u>Yes</u>
Has an outage schedule been approved?	<u>No</u>
Are Operations & Maintenance procedures/training required?	<u>No</u>
<b>STANDARDS</b>	
Does the project include standard equipment and designs?	<u>Yes</u>
<b>SUBSTATION ENGINEERING</b>	
Does this impact Revenue Metering	<u>No</u>
Is preliminary short circuit/ breaker duty analysis required?	<u>No</u>
Are there any changes to the baseline audible noise?	<u>No</u>
Is there an impact to the existing ground grid?	<u>No</u>
Is a Transient Over Voltage (TOV) analysis required?	<u>NR</u>

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Project Authorization Form

Project Checklist - Transmission & Substation Capital Project	
<b>Project Name: E. Northwood SS Regulator Replacement</b>	<b>Project Number: A20E43</b>
<b>P&amp;C ENGINEERING</b>	
OP-22 - Are PMUs and DDR required?	<u>No</u>
If BPS, is an NPCC Directory #4 presentation required?	<u>No</u>
Are ISO-NE OP-24 Appendix B updates necessary?	<u>No</u>
<b>TRANSMISSION LINE ENGINEERING</b>	
Are there any changes that affect the baseline EMF?	<u>No</u>
Are there any changes that affect the baseline EMI?	<u>No</u>
<b>SITING</b>	
Is a Siting filing required? (If yes, list in regulatory approvals section)	<u>No</u>
<b>PERMITTING</b>	
Is there any permitting required? (If yes, list in regulatory approvals section)	<u>No</u>
<b>SITING &amp; CONSTRUCTION SERVICES (OUTREACH)</b>	
What is the level of outreach expected?	<u>Low</u>
<b>INITIATOR</b>	
Has a field constructability review been completed?	<u>Yes</u>
<b>INVESTMENT RECOVERY</b>	
Does the project require development of an Investment Recovery plan?	<u>No</u>
<b>COST ESTIMATING</b>	
What team/firm prepared the cost estimate?	<u>Estimate was prepared by Eversource Engineering</u>
Name of the person who prepared the estimate:	<u>Caryn Murray</u>
Was the estimate reviewed by Eversource Estimating?	<u>Yes - Partial Review</u>

## Cost Estimate Backup Details

See Attachment B - P-20-478 A20E43 SSF East Northwood SS



# EVERSOURCE

Constructability Review Form

*Submit a PDF copy of this signed form to TranEPAC@eversource.com along with the PAF*

<b>Project Number(s):</b> A20E43	<b>Project Title:</b> East Northwood SS Regulator Replacement
<b>Date of Constructability Review:</b> 08/13/2020	

Constructability Review Team: *list below the department and names of all who participated in the constructability review walkdown*

Lead*	Department**	Name and Title
<input type="checkbox"/>	Project Management	
<input type="checkbox"/>	Operations	
<input type="checkbox"/>	Construction	
<input checked="" type="checkbox"/>	Engineering	Gary Stanton, Senior Designer, Substation Engineering
	Siting	
	Siting & Construction Services	
	Environmental	
	Rights & Survey	
	Other:	David Still, Senior Engineer, Civil Engineering
	Other:	
	Other:	

\*Check the box of the individual who coordinated/led the constructability review

\*\*List names from any other departments who attended the constructability review, add additional rows to the table if necessary

Observations/Findings/Scope Review/Risks Identified:  
*list below the outcome of the constructability review.*

Observations:

- Mobile substation connections to both 34.5kV and 12.47kV lines ARE available. Minimal work required to position and connect mobile.
- Existing fence is not to current standards.
- Active bee hive under the switch sled of the 109(12.47kV) bypass switch

Findings:

- Northern fence line fabric and posts will need to be removed to allow regulator to be rigged out of yard.
- Fill will be required on Northern side of fenced area to also allow rigging of regulator.
- No evidence of wetland issues in proposed fill area (Environmental/Kurt Nelson should confirm)

# EVERSOURCE

Constructability Review Form

- *An additional beam may be required to accommodate the regulator disconnect switch/bypass switch configuration.*

*Scope Review:*

- *Construction Scope Document has not been written as of the writing of this form to support this project*

*Risks Identified:*

- *Switching Mobile substation into service*
- *63W1 Circuit fed from Mobile Substation*
- *Single customer fed from Distribution transformer mounted on first pole outside yard on 63W1 Circuit (Is on line side of suspension disconnect 63W1DX1).*
- *There is wetland in the area near where the regulator will be rigged out. Caution will need to be taken to insure there are not wetland impacts.*
- *Small site to accomplish work. Parking will be an issue. (there is a Park and Ride a few hundred yards South of the site at the intersection of Rte. 202 and Rte. 4 that can be used.*
- *Limited clearance above area to rig out regulator. Inline disconnect 63W1DX1 (visual opening for clearance) is in this span.*

The Construction Services Supervisor, Engineer lead, or Project Manager must sign below.

*Gary Stanton*

*8/17/20*

\_\_\_\_\_  
*Signature*

\_\_\_\_\_  
*Date*

			A20E43 East Northwood SS Regulator Replacement Project Schedule						13-Aug-2020 10																			
Activity ID	isWork Order	Activity Name	isStreet	BL Project Start	BL Project Finish	BL Project Duration	BL Project Labor Units	Total Float	2020														2021					
									September		October				November				December				January					February
									13	20	27	04	11	18	25	01	08	15	22	29	06	13	20	27	03	10	17	24
CP-17621960	A20E43	2020 Capital: Begin A20E43 East Northwood SS Regulator Replacement Project	East Northwood	01-Oct-2020 07		0.00d	0.00h	5.00d	◆ 2020 Capital: Begin A20E43 East Northwood SS Regulator Replacement Project																			
CP-17621970	A20E43	2020 Capital: Mobile Install	East Northwood	01-Oct-2020 07	07-Oct-2020 15	5.00d	160.00h	5.00d	▬ 2020 Capital: Mobile Install																			
CP-17621980	A20E43	2020 Capital: Construction, Testing & Commissioning	East Northwood	08-Oct-2020 07	29-Oct-2020 15	15.00d	480.00h	5.00d	▬ 2020 Capital: Construction, Testing & Commissioning																			
CP-17621990	A20E43	2020 Capital: Mobile Removal	East Northwood	30-Oct-2020 07	05-Nov-2020 15	5.00d	160.00h	5.00d	▬ 2020 Capital: Mobile Removal																			
CP-17622000	A20E43	2020 Capital: End A20E43 East Northwood SS Regulator Replacement Project	East Northwood		05-Nov-2020 15	0.00d	0.00h	5.00d	◆ 2020 Capital: End A20E43 East Northwood SS Regulator Replacement Project																			