

CI Number: C0051815

Title: RTU Replacements Program – Phase 6

Start Date: 2024/04
In-Service Date: 2025/07
Final Cost Date: 2027/11
Function: General Plant
Forecast Amount: \$5,959,915

DESCRIPTION:

Remote Terminal Units (RTUs) are deployed in substations and generating stations to allow for the exchange of telemetry and control signals to enable the effective operation of NS Power’s SCADA system and power grid. The RTUs help monitor the system condition and also help restore outages faster when they occur. A robust RTU network is foundational for NS Power to deliver on Grid Modernization initiatives including advanced Protection Settings and Automation. This project provides for the replacement of fourteen RTUs in 2025 through 2027. The associated telecommunications equipment and the connection of Intelligent Electronic Devices (IEDs), such as recloser controllers, transformer meters, and relays, are included in this project.

Components removed will be retained and reused to enable NS Power to redeploy the equipment components as spare parts to extend the life of similar RTUs in service that are not yet being replaced. The work under this project will be completed over three years.

Summary of Related CIs +/- 2 years

Pursuant to Section 11.2 of the CEJC, related CIs for General Plant projects include “Work completed on the same asset (application, building, etc.).”

- No other projects in 2023, 2024, 2025, 2026, or 2027

Depreciation Class: General Plant – Communication Equipment - SCADA Eq

Estimated Life of the Asset: 20 years

Retirement Information:

- Categorization of Retirement: Accounting Policy 6420 - Retirement and Disposal of Capital Assets
- Percentage of Asset Pool: 9.04%

JUSTIFICATION:

Justification Criteria: Work Support Facilities

Sub Criteria: Telecontrol & Telecommunications

Why do this project?

Due to evolving industry standards, technology and product lifespans, approximately 74 of the RTUs that are currently in service have been deemed as obsolete by their manufacturers. The commercial availability of spare parts is becoming difficult to manage effectively. Equipment removed from service under this project can be harvested for spare parts which will support other existing RTUs until such time that they are also replaced.

In line with NS Power’s Asset Management methodology, the condition and criticality (factoring in the age of existing RTUs, manufacturer life cycle dates, the RTU maintenance history, and criticality) of the RTUs on the system was assessed. The fourteen RTUs identified in this project had a risk rating indicating that risk mitigation activities were required. In this case, the appropriate risk mitigation activity is replacement. Each of these fourteen units will have reached or surpassed their expected 20-year life span and surpassed their manufacturer end of service date by ten years or more, and considering their overall risk profile, they need to be replaced.

Why do this project now?

The inventory of RTU spare parts has become sparse. The RTUs being replaced by this project have been deemed obsolete, as discussed above. RTU installations require extensive time and effort (approximately 12 weeks) to complete and having an effective RTU management plan is critical for the orderly replacement of units that are experiencing reliability issues and for the gradual modernization of the fleet.

The fourteen units in scope for this project have surpassed expected life, and manufacturer end of service date, are now considered to be obsolete, and at increasing risk of no longer being able to be maintained in working order.

This project is deemed in-service when the first RTU is installed (forecast to be July 2025), therefore the Final Cost Date (November 2027) is listed as six months after the last RTU is forecast to be completed (May 2027).

Why do this project this way?

RTU replacement is the only alternative as the targeted RTUs are now considered to be obsolete. The technology, both hardware and software, is familiar to field and engineering personnel through regular training and exposure. Additionally, standardization of equipment will lead to a more sustainable spare parts inventory. The approach for the execution of RTU replacements is based on previous new deployment and replacement project approaches and continues to be refined as experience grows; however, the overall methodology has been proven effective.

The selection of the first fourteen unit replacements is based on the overall risk matrix of condition and criticality.

Contingency Statement

Contingency is determined using a combination of internal subject matter expert judgment (professional engineers and project managers) and the non-binding contingency guidelines. Consistent with the maturity checklist this project is being filed as a Class 3 Estimate with a contingency value appropriate to that range. Risks intended to be covered by the contingency are overtime work that may be required, unexpected significant increase in currency exchange rate, or material cost. Risks are well understood based on past program experience, and similar past projects have included a 10% contingency, which has generally been required to complete the intended scope.

CI Number : C0051815 - RTU Replacements Program Phase 6

Project Number C0051815

Parent CI Number : -

Asset Location : 1500 - 1500 General Plant General

Budget Version 2025 ACE Plan

Capital Item Accounts

Exp. Type	Utility Account	Forecast Amount
Additions	6400 - GP - Sup. Control and DA	5,356,516
Retirements	6400 - GP - Sup. Control and DA	603,400
Total Cost:		5,959,915
Original Cost:		2,747,780

Capital Project Detailed Estimate

Location: General Plant C# : C0051815 Title: RTU Replacements Program – Phase 6 Execution Year: 2025 - 2027						
Description	Unit	Quantity	Unit Estimate	Total Estimate	Cost Support Reference	Completed Similar Projects (FP#'s)
Regular Labour						
SM Electrician	PD	922	\$ 450	\$ 414,700		
Telecontrol Engineer	PD	648	\$ 457	\$ 295,812		
Telecontrol Technologist	PD	295	\$ 450	\$ 132,750		
PLT - Field Resources	PD	230	\$ 450	\$ 103,500		
Drafting SME CADD	PD	130	\$ 425	\$ 55,250		
Project Manager	PD	600	\$ 450	\$ 270,000		
SCADA	PD	52	\$ 425	\$ 22,100		
			Sub-Total	\$ 1,294,112		
Term Labour						
RTU Technician	PD	1090	\$ 425	\$ 463,250		
				\$ 463,250		
Overtime Labour						
SM Electrician	PD	20	\$ 900	\$ 18,000		
			Sub-Total	\$ 18,000		
Travel Expense						
Travel	Lot	1	\$ 117,150	\$ 117,150		
			Sub-Total	\$ 117,150		
Materials						
RTUs	Ea	14	\$ 70,664	\$ 989,300		
Cable and Accessories	Ea	14	\$ 8,000	\$ 112,000		
Power Meters	Ea	14	\$ 5,170	\$ 72,380		
Test Equipment and Tools	Lot	1	\$ 11,000	\$ 11,000		
			Sub-Total	\$ 1,184,680		
Contracts						
Electrical Engineering Technologist	Days	546	\$ 900	\$ 491,400		
Civil Construction	Days	156	\$ 1,430	\$ 223,080		
			Sub-Total	\$ 714,480		
Meals						
Meals	Units	378	\$ 40	\$ 15,120		
			Sub-Total	\$ 15,120		
Contingency						
Contingency		10%	\$ 3,806,792	\$ 380,679		
			Sub-Total	\$ 380,679		
Interest Capitalized						
AFUDC Interest				\$ 17,848		
			Sub-Total	\$ 17,848		
Vehicle Overhead						
Vehicle AO				\$ 650,565		
				\$ -		
			Sub-Total	\$ 650,565		
Administrative Overhead						
Labour AO				\$ 1,000,498		
Contractor AO				\$ 103,533		
			Sub-Total	\$ 1,104,031		
SUB-TOTAL (no AO, AFUDC)				\$ 4,187,471		
TOTAL (AO, AFUDC included)				\$ 5,959,915		
Original Cost				\$ 2,747,780		
Note 1: The labour figures noted above are an average of salaries across a variety of jobs within similar classifications including fringe, and are used solely for budgeting purposes. Note 2: Small differences in totals are attributable to rounding.						



Instructions: Select option in Column B.
Columns C through G will auto-populate.

Document No: XXX-XX-XXXX-XXXX

Project Cost Estimate Input Checklist and Maturity Matrix						
Equipment Replacement	Required fields:	Estimate Classification				
Project Name: C0051815 - RTU Replacements Program – Phase 6	Started or Preliminary	Class 5	Class 4	Class 3	Class 2	Class 1
Maturity Level of Project Definition Deliverables	Defined or Complete	0% to 2%	1% to 15%	10% to 40%	30% to 75%	65% to 100%
General Project Data						
A. Scope						
Project Scope of Work Description	Defined (D)	P	P	D	D	D
B. Capacity						
Not Applicable						
C. Project Location						
Hardware (server, network infrastructure)	Defined (D)	P	P	D	D	D
D. Requirements						
Codes and/or Standards	Defined (D)	NR	P	D	D	D
Legislative Requirements	Not Applicable (NA)	NR				
E. Technology Selection						
Design/Technology	Defined (D)	NR	P	D	D	D
F. Strategy						
Contracting/Sourcing	Defined (D)	NR	P	D	D	D
Escalation	Defined (D)	NR	P	D	D	D
G. Planning						
Logistics Plan	Defined (D)	P	P	P	D	D
Integrated Project Plan	Preliminary (P)	NR	P			
Project Code of Accounts	Defined (D)	NR	P	D	D	D
Project Schedule	Preliminary (P)	NR	P			
Regulatory Approval & Permitting	Defined (D)	NR	P	D	D	D
Risk Register	Defined (D)	NR	P	D	D	D
Stakeholder Consultation/Engagement/Management Plan	Defined (D)	NR	P	D	D	D
Work Breakdown Structure (WBS)	Preliminary (P)	NR	P			
Start-up & Commissioning Plan	Preliminary (P)	NR	P	P/D		
Technical Deliverables (Specifications and/or Drawings)						
Network Infrastructure	Complete (C)	P	P	C	C	C
Data Architecture	Complete (C)	P	P	C	C	C
Security Assessment	Complete (C)	NR	P	C	C	C
Privacy Impact Assessment	Not Applicable (NA)	NR				
Information Systems / Telecommunication Drawings	Preliminary (P)	NR	P			
Total Responses	Total # Deliverables for this Project	5	19	15	14	14
Percentage	% Defined/Complete towards Class Estimate	100%	100%	79%	74%	74%

Comments:

The maturity matrix indicates that 79% of the deliverables used in compiling a Class 3 estimate with exception have been completed. The critical scope of this work is well understood based on previous program replacements and the estimate is considered to have AACE Class 3 accuracy. While the Project Schedule, WBS, Telecommunication Drawings e.t.c. are in preliminary status, the impact of these on project costs is minimal and not enough to lower this estimate from a Class 3.

Legend:

The maturity level is an approximation of the completion status of the deliverable. The completion is indicated by the following descriptors:

General Project Data:

- Not Required (NR): May not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Preliminary (P): Project definition has begun and progressed to at least an intermediate level of completion. Review and approvals for its current status has occurred.
- Defined (D): Project definition is advanced, and reviews have been conducted. Development may be near completion with the exception of final approvals.

Technical Deliverables:

- Not Required (NR): Deliverable may not be required for all estimates of the specified class, but specific project estimates may require at least preliminary development.
- Started (S): Work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): Work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): The deliverable has been reviewed and approved as appropriate.

Note: This checklist is intended to be used for IT/OT projects. In lieu of specific AACE guidelines for these types of projects, this checklist was developed by NSPI following the principles of the guidelines to demonstrate confidence in the cost estimate maturity.