

**Work Scope**  
**For**

NGS CT5 Electrical Equipment Upgrade

PWO 31257822

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## **1.0 Introduction**

### **1.1. Justification**

JEA's Northside Generating Station has combustion turbines that have been in service for over 40 years, with original equipment still in use today. Concerns over reliability of this equipment and safety of personnel has warranted their replacement.

### **1.2. Scope of Work**

The contractor must decommission, relocate, and install all electrical equipment within/surrounding the CT's power cab. All associated wiring/cabling will have to be tracked, labeled, and replaced/preserved.

## **2.0 JEA Responsibilities**

### **2.1. Project Management**

JEA will provide a project manager to assist with access to the site, project planning, and communication with JEA personnel.

### **2.2. Equipment Isolation**

JEA will utilize Lock Out Tag Out (LOTO) procedures to isolate equipment from being energized. Caution should still be practiced around any equipment that could be energized.

### **2.3. MCC, Switchgear, and Panel Acquisition**

JEA will acquire the major equipment being installed (LV/MV MCCs, Panelboards, XFMRs). Any equipment that needs to be acquired by the contractor will be specified in *Section 3.0*.

### **2.4. Field Engineer Support**

The OEM will provide a field engineer to inspect installed equipment and support contractors in the installation process.

### **2.5. Power Cab Extension**

JEA will subcontract the work required to extend the power cab's walls and floors. Coordination between contractors and JEA personnel is likely as electrical work may be delayed to continue the cab extension

### **2.6. Fire Alarm System Relocation**

JEA will subcontract the work required to relocate the fire alarm system before and after the electrical equipment work.

## **2.7. Inspection and Startup**

JEA engineering, maintenance, and operations personnel will inspect equipment once installed. They will also initiate startup procedures to ensure equipment functions as intended. Contractor must have personnel on standby in case of needed troubleshooting.

## **2.8. CT Equipment Testing**

Electrical, mechanical, and functionality testing of MCC/Switchgear load equipment will be performed by JEA maintenance after installation is complete.

## **3.0 Contractor Responsibilities**

The following sections describe the contractor's work scope and material specification required to complete all work. Work must be done in accordance with NEC and OEM installation requirements. Any tools required to complete work must be provided by the contractor.

Some work areas will be considered as confined spaces. JEA protocol must be followed. A hole watch and air monitor must also be provided when entering a confined space.

### **3.1. MCC and Switchgear Decommission**

The existing low voltage MCC and medium voltage switchgear must be dismantled and disposed from the power cab.

Any feeder cables entering/exiting the MCC/switchgear must be taped off, labelled, and preserved. Preserved cables will be re-used in the new equipment, unless specified to be replaced later in the specification or in attached document: *"NGS CT5 Cable Replacement"*.

Any control wires entering/exiting the MCC/switchgear must be bundled, labeled, and preserved after removal. Tracking of removed cables is required to be used for keeping record of cable amounts and routing whenever the new equipment is installed.

Any copper wire removed, but not reused, must be preserved and placed on a pallet towards the end of the project. This pallet will be turned in to JEA for investment recovery.

### **3.2. Equipment Relocation**

The following items must be removed before equipment installation, then installed to different spots of the cab after equipment installation, per installation drawings and JEA discretion.

#### **3.2.1. Cab Heater**

The cab's ceiling-attached heater must be relocated to a different portion of the cab to make room for new equipment. Associated wiring and conduit must be replaced to accommodate the new location (approximate size/length in attached document: "*NGS CT5 Cable Replacement*").

#### **3.2.2. Receptacles and Light Switches**

The cab's 120VAC power outlet and light circuits must be replaced and distributed throughout the cab based on locations of new equipment. The following must be provided by the contractor:

- 1 receptacle (2 socket)
- 1 light switch
- 2 bar lights (ceiling mounted)

Associated wiring and conduit must be replaced to accommodate the new locations (approximate size/length in attached document: "*NGS CT5 Cable Replacement*").

### **3.3. Equipment Installation**

The following items must be installed all within/around the cab based on installation drawings and JEA discretion. Items that require acquisition will be explicitly mentioned.

#### **3.3.1. New Low Voltage MCC**

A new low voltage MCC replaces the existing MCC, with a different orientation. The new cab layout is outlined in attached document: "*MCC House Layout*".

#### **3.3.2. Indoor Junction Box**

Feeder cables preserved from the existing MCC will terminate in the new MCC. Cables that are too short to reach the MCC's new location must terminate in a new junction box, which must be provided by the contractor (details and example in Section 4.2).

From the new junction box, new cable must be pulled to the MCC to accommodate for the cables that are too short (approximate size/length in attached document: "*NGS CT5 Cable Replacement*").

### 3.3.3. Marshalling Cabinet Wiring

An existing marshalling cabinet acts as the junction for most of the control wiring coming from cab equipment, which then exits the cab. All control wires from the marshalling cabinet to the cab equipment must be removed and replaced (approximate wire specifications in attached document: "NGS CT5 Cable Replacement").

Most control wiring will correspond with the wires removed from the existing MCC. Documentation of wires removed is required to ensure all wires are accounted for when installation is complete.

### 3.3.4. New Medium Voltage Switchgear

A new medium voltage switchgear replaces the existing switchgear. Control wires from the switchgear to the marshalling cabinet must be replaced. Equipment feeder cables also must be replaced (approximate specification outlined in attached document: "NGS CT5 Cable Replacement").

*Note:* Existing current transformers incorporated with MV cables. New stress cones also required for MV cable installation.

### 3.3.5. DC Starter, Breaker Panels, and Transformer

A new 125VDC starter must be installed, along with new cabling and conduit.

New 120/208VAC and 125VDC panels will replace existing panels, where existing cables will transfer over to the new panels but will require new conduit to be installed.

A new 480VAC-120/208VAC transformer (30kVA) must be installed.

Any feeder cables and conduit needed for this equipment will be specified in attached document: "NGS CT5 Cable Replacement".

### 3.3.6. Atomizing Air and Cranking Motor Termination Boxes

Near the atomizing air and cranking motors, there are termination boxes that must be replaced with new termination boxes. Specifications for the new boxes are shown in attached document: "Cranking and Atomizing Motor Junction Boxes".

The cables terminating in these boxes also must be replaced. Approximate specification for these cables is outlined in attached: "NGS CT5 Cable Replacement".

#### 3.3.7. Outdoor Junction Box

Outside of the power cab, a junction box must be installed near a cable tray leading into the sump underneath the cab. The junction box will be used to terminate any feeder cables that are too short to terminate to new equipment locations (details and example in Section 4.3).

New cables and conduit must also be installed, specified in attached document: "NGS CT5 Cable Replacement".

#### 3.3.8. Cable Tray Installation

New aluminum cable trays must be installed in the area underneath the cab's extended portion. Orientation of the cable trays shown in diagram in attached: Cable Tray Layout.

#### 3.3.9. Marshalling Cabinet Support

The existing marshalling cabinet is currently supported by the LV MCC. However, with the new layout, the support will no longer be present. New support for the cabinet must be constructed and attached (pair of 10ft Unistrut, or equivalent).

### 3.4. **Cable Pulls & Conduit Installation**

All wires/cables mentioned in this specification and other cables not mentioned yet are detailed/approximated in attached: "NGS CT5 Cable Replacement".

Additionally, new/existing wires terminating in new equipment must be labeled. Labels must be heat shrink or self-laminating cable labels. Information on labels must include:

- Current Termination point
- Cable destination point

It is recommended to record the cable de-terminations and terminations done throughout the project, to assist in tracking and labelling cables.

### 3.5. **Cable Testing**

All LV/MV equipment feeder cables tampered with during installation must be tested for quality (continuity & insulation) once installation is complete.

### 3.6. **Startup and Commissioning Contractor Presence**

After all equipment is installed and startup/commissioning procedures begin, personnel must be on standby to perform any troubleshooting necessary.



#### **4.0 Support Documentation**

The following sections provide additional detail for specifications mentioned in the contractor responsibilities sections.

##### **4.1. Attached Documents**

The listed documents should be sent/attached with this work scope for further equipment specification:

- MCC Cab Layout
- Cranking and Atomizing Motor Junction Boxes
- NGS CT5 Cable Replacement
- Cable Tray Layout

#### 4.2. Indoor Junction Box

A junction box must be provided inside the cab, like the ones installed during previous equipment upgrade projects seen below. The dimensions must be around 12" D, 90"H, 25" W. Painted to ANSI 61 or 70 light gray color. Must also be provided with finger-safe lug/termination blocks to mitigate accidental contact with conductors while the box is open.

CT4 indoor junction box after installation:



CT4 indoor junction box (opened) after installation



### 4.3. Outdoor Junction Box

A junction box must be provided inside the cab, like the ones installed during previous equipment upgrade projects seen below. The dimensions must be around 12" D, 36" H, 36" W. Painted to ANSI 61 or 70 light gray color. Must also be provided with finger-safe lug/termination blocks to mitigate accidental contact with conductors while the box is open.

Current CT5 conduit/cable tray:





CT4 conduit/cable tray after installation (example):



#### 4.4. Additional Pictures

The following pictures are provided for visualization and documentation of the project.

Current CT5 cab – northern half (showing LV MCCs)





Current CT5 cab – southern half (showing MV MCC and heater)





Current area under CT5 extended cab:





Area under CT4 extended cab after installation:



#### **4.5. Additional Site/Contract Requirements**

The below list outlines general site and contract requirements for completion of work.

- Follow JEA Contractor Safety and Site Specific protocols
- Provide English speaking site leads who will remain on-site throughout the duration of the project
- Contractor will be responsible for having all necessary JEA required training and personal protective equipment (PPE) prior to performing any work on the plant site
- Contractor must be JEA safety pre-qualified prior to work commencement and meet JEA standards for unescorted work, which includes being CPR qualified, per JEA standards
- Contractor must provide all miscellaneous items necessary for safe project work
- Contractor must provide drinking water for their employees
- Contractor must furnish Port-o-Lets and wash stations for their employees
- Contractor must provide lighting for interior work and night shift work
- Only work vehicles, with company identification logos on each side of the vehicle, will be permitted on the plant site
- The contractor is advised that other projects may be in progress at the various plant sites during the agreement period. Coordination and cooperation with other contractors, JEA personnel, and others working in the area will be required to ensure work will be completed safely and timely.
- Contractor shall not initiate "out of scope" services without obtaining prior authorization from the JEA Project Manager. For example, if during project work, a potential problem or issue is identified by the contractor, the JEA Project Manager must be notified immediately of the issue. Then the "out of scope" services will be authorized.