

JEA

Northside Generating Station

JACKSONVILLE, FLORIDA

Non Segregated Phase Bus Duct

**Cleaning and Inspection
JEA NGS N03 TG3SU
Non-Segregated Bus
Cleaning Inspection and Repair**

Technical Specifications

Revision 3b 8/28/18

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General Requirements and Scope of Work

1.1 Overall Site Description

The Northside Generating Station (NGS) is located north of downtown Jacksonville on 4377 Heckscher Drive, Jacksonville, FL 32226, in Duval County. JEA's NGS has four combustion turbines (CT's) (Units N33, N34, N35, and N36) that have been in service since Circa 1975 and three steam turbine units (N01, N02 and N03) that have been in service since 1965, 1972, and 1977 respectively. The N03 Non-Segregated Phase Bus Duct (Non-Seg) between the Startup Transformer (TG3SU) and the 4160V switchgear, uses 1960's technology of an electric heating system to keep moisture out of the bus duct.

1.2 Contractor's Scope of Work

The scope of work includes inspecting and cryogenically cleaning the Non-Seg bus duct system between the TG3SU and the N03 4160 switchgear and a point check inspection of the N03 IPB. The Bidder shall furnish all equipment, supervision, labor, transportation, tools and expendables to cryogenically clean to remove all foreign matter, inspect and make repair recommendations for the existing Non-Seg bus duct. The purpose is to ensure that the duct, bus and insulators are sufficiently clean and that the duct is properly sealed against moisture intrusion. If any equipment is found to be damaged, it will be up to the JEA Project Manager to decide if the equipment is to be left as-is, repaired or replaced.

High-Pot Test – A 10kV High-Pot test shall be performed before and after the inspection. The megger plan, along with expected values, shall be prepared by the contractor and shared with the JEA Project Manager for approval. All readings will be shared with the JEA Project Manager and be included in the final report. The final megger test will be used to prove that all insulators are intact and have been properly cleaned. Either the JEA Engineer or Project Manager shall be present for each and every test.

Non-Seg Inspection – Inspection is to be done both before and after cleaning. All access hatch covers shall be removed to allow for visual inspection of the Non-Seg bus duct interior, gaskets, insulators, connections and bushings.

IPB Inspection - N03 IPB will be inspected and cleaned in the fall of 2019. Three points will be accessed and inspected for condition of the bus, bus duct, connections, and any other relevant data that can be acquired by taking pictures, video, and having the foreman and project manager agree on expected future findings based on the information obtained. These points include the dog houses on the paralleled GSU's TG3A and TG3B, and the generator compartment accessed by the mezzanine floor of the power block.

All seals, insulators and connections shall be visually inspected using a bore scope and documented with both a video log and a still photograph log both before and after cleaning. The photographs will be edited (adding pointer, circles, notes and location references) to show any found deficiencies and imperfections. A copy of both the video log and the photo log will be included in the final report.

Equipment List – The equipment list is intended to be a partial list with special notes on what to look for. It is not intended to provide an exhaustive list.

1. Access hatches and gaskets - All access hatches are to be removed and be left off until the JEA Project Manager directs the contractor to reinstall them. All gasketing will be replaced with new approved gasketing. The covers will be placed back into position at the end of each day or shift. All hardware will be replaced with 316 stainless supplied by the contractor.
2. Insulators and Bushings – The insulators (144), bushings (18) and mounting hardware looking for any damage using bore scope and video/picture log. All hardware will be replaced with 316 stainless supplied by the contractor.
3. Heaters – Verify integrity of heater circuits and each individual heater for proper resistance and in service amp draw.

4. Non-Seg Bus – The current carrying conductors are painted aluminum pipe. In places, the painted surface has foreign matter and may have started to flake. This inner pipe and the inside of the surrounding grounded pipe is to be thoroughly cleaned using lint free rags, mops, and vacuum cleaners to remove all foreign matter where accessible from the access hatches. The pipe is not expected to need to be repainted as part of this scope.
5. Flexible shunts braids - All (108) of the flexible shunts (flex braids) internal to the Non-Seg bus ducts need to be indexed, disconnected and visually inspected for discoloration, broken strands, pits, hot spots and have a DLRO (digital low resistance ohm) test performed to make sure they are all within 1% resistance of each other (so there is no selectivity of flexible links carrying more current than others). All hardware is to be replaced with 316 stainless, including stainless steel conical washers.
6. Grounding Connections – All bolts that are used for grounding connections shall be re-torqued to manufacturer recommendations.
7. 4.16 kV Connections – All 4.16 kV electrical bolted connections in the bus duct are believed to be silver plated copper or copper clad silver plated aluminum. If damaged, it will be up the JEA Project Manager to decide if the stab/connector is to be repaired or cut out and replaced with a new silver plated connector. All stainless steel conical washers and hardware to be replaced with 316 stainless steel.
8. Enclosures and Seals – The transformer termination enclosure and the disconnect inside the switchgear room have seals that will have to be replaced.
9. Torque All Bolts – After inspection and upon reassembly, all bolts that are used for the 4.16 kV electrical connections will be re-torqued to manufacturer recommendations. In the absence of any manufacture recommendations use:
 - 5/8" 55Ft-lbs and
 - 1/2" 45Ft-lbs
10. Grounding – The exterior of the Non-Seg bus duct is grounded. Those ground connections shall be inspected and tightened or checked for tightness.
11. Cleaning – After cryogenically cleaning, all insulators, bushings and connections and shall be wiped down and cleaned to remove all FME (foreign material). The inside of the Non-Seg bus duct that can be reached by hand and with mops from the access hatches shall also be cleaned. Sufficient cleanliness will be defined by the project manager before any access point is closed.

For the final cleaning, the contractor shall supply and use the following product or approved equivalent to wipe down the insulators and bushings:

JEA part number:
 ADCCL024
 JEA DESCRIPTION - CLEANER,
 DIELECTRIC SOLVENT & DEGREASER,
 5 OR 6 GALLON PAIL DI-ELECTRIC
 MIN 28 KV NON-HAZARDOUS,
 COMPLETE EVAPORIZATION LEAVING NO FILM OR RESIDUE
 NO SUBSTITUTE

Manufacturer of the cleaner:
 SELIG CHEMICAL INDUSTRIES (p/n 2231, ZONE DEFENSE-5 GALLON)
 ECOLINK (p/n 0296)
 Suppliers:
 IRBY,
 HD Supply,

12. Drain system – Each drain will need to be cleaned and inspected.

Preliminary Reports – during the cleaning and inspection, the contractor will keep JEA informed of any damaged equipment along with recommendations on their disposition, including how to repair or replace damaged equipment.

Final Report – The contractor shall prepare a final written report that includes a copy of the video log and picture log. The pictures shall include typical insulators as found, all cleaned insulators and all equipment identified as having flaws before and after repair of all work done.

Extra work – It is anticipated that repair work will be necessary. The contractor shall provide unit costs for each of the following items:

- Inspect additional connections,
- Clean electrical connections-jumpers,
- Copper/Silver re-plating of aluminum connectors,
- Silver re-plating of electrical connections,
- Replace damaged/missing 4.16 kV connection bolts (316 SS, not 304),
- Replace cracked/damaged insulators,
- Replace insulator bolts,
- Replace hatch cover bolts,
- Replace hatch gasket material,
- Replace damaged heater elements,
- Replace damaged heater electrical wiring, and
- Other - typical adders that the contractor is aware of.

1.3 Site Conditions

The Contractor acknowledges that it has investigated prior to bidding and satisfied itself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal handling and storage of materials, availability of labor, roads, or storage areas. Any failure by the Contractor to acquaint itself with the available information will not relieve them from responsibility for estimating properly the difficulty or cost of successfully performing the Work. JEA assumes no responsibility for any conclusions or interpretations made by the Contractor on the basis of the information made available by JEA.

Site parking will be available on the property in an area designated by the JEA Project Manager. Site access will be available 7 days per week. Site water and power are available. Contractor must provide their own telephone services and office spaces.

Any temporary roads, staging areas or work areas that are required to be created due to the existing conditions are the responsibility of the Bidder.

Access to work areas require ladders and JEA provided scaffolding. The scaffolding will be staged per the contractor's direction one week before the start of the project.

1.4 Final Grading and Restoration.

At the completion of the Work, holes, ruts, settlements, and depressions resulting from the Work shall be filled and graded to match elevations of adjacent surfaces, and areas disturbed by the Work shall be restored to their original condition.

1.5 Safety, Health, and Accident Prevention

Contractor shall take all JEA required contractor safety and site specific safety training.

All JEA contractors, and their subcontractors performing safety sensitive work on our projects will adhere to our safety practices and guidelines. Every person who works on any JEA project is expected to follow these practices to ensure their personal safety as well as the safety of every other person on a site or in the nearby community.

Contractors must be safety qualified **before** their bid will be accepted for this scope of work. **Safety qualification is necessary** for contractors and subcontractors for this project.

Every JEA safety qualified vendor **must re-qualify annually**.

1.6 Damages

Damage to adjacent facilities caused by Contractor's activities shall be repaired at no additional cost to the JEA. Contractor may have JEA or a JEA contractor perform the work at the Contractor's cost. JEA may withhold payment(s) from Contractor for damages until corrected.

1.7 Forced Shutdown

JEA reserves the right to shut down the activities at no additional cost to JEA due to one or more of the following conditions:

- Potential safety concerns.
- Weather
- The need to terminate the unit outage prematurely.

1.8 Site Security

Site security is provided by JEA on a 24 hour, 7day per week basis. All contractor employees will pass thru security and vehicle inspections may occur.

1.9 Schedule

The NGS outage is scheduled for December 2, 2018 thru December 15, 2018. It is anticipated that this work may begin on the third day of the outage, December 4 and must complete by end of business December 14, 2018. No extensions will be granted.

The Company shall not commence any work until a notice to proceed is received. A project schedule for this Contract shall be prepared and maintained by the Company to provide coordination, to establish the basis for measuring and monitoring Company progress and to detect problems for the purpose of taking corrective action. Company shall provide JEA with weekly updates. These updates shall include the following:

- Current status of the job progress
- Three day Look-Ahead Schedule
- Report the planned and actual progress of the current week
- Report all planned work that is to be accomplished during the follow week
- Changes in the Work
- Safety and Quality Control issues
- Problem areas or concerns

The minimum qualifications shall be submitted in the format attached. The references shall be presented in the order described below. In order to be considered a qualified supplier by JEA you must meet all the criteria listed and be able to provide all the services listed in this specification. Submit with Bid or Proposal in accordance with the requirements of the solicitation.

Company shall ensure listed references can be contacted to verify minimum qualifications compliance. If JEA cannot contact the submitted reference, JEA may request an additional point of contact from the same reference, however, will not allow the Company to change references. If the reference cannot be verified, JEA may reject the submitted Bid or Proposal.

RESPONDENT INFORMATION

COMPANY NAME: _____

BUSINESS ADDRESS: _____

CITY, STATE, ZIP CODE: _____

TELEPHONE: _____

FAX: _____

E-MAIL: _____

- The Bidder shall have successfully completed three (3) similar projects in the past three (3) years, date ending the Bid Due Date. A similar project is defined as a bus project similar that stated in the Technical Specifications. Each project shall have been greater than \$200,000.00 in value.
 - Additionally, any similar projects completed by the Bidder previously for JEA shall be include as one of the submitted Minimum Qualifications, regardless of project cost.
- A resume for each of the following personnel must be included with the Bid, additionally, the following personnel must be onsite for the duration of the project:
 - The onsite project manager must have had at least five (5) years' experience inspecting and repairing Isolated Phase Buses (IPB) and non-segregated bus systems.
 - The onsite job foremen must have had at least four (4) years' experience inspecting and repairing IPB and non-segregated bus systems.
 - Onsite Technician completing the silver plating must have at least four (4) years of experience silver plating IPB and non-segregated bus systems.

Appendix B - Minimum Qualifications Form
161-18 Northside Generating Station Unit 3 Non-Segregated Bus Cryogenic Clean and Inspection

Reference ____ of ____

Primary Nature of Service Provided: _____

Location: _____

Customer: _____

Reference Name: _____

Reference Phone Number: _____

Email Address: _____

Project Value: _____

Description of Project:

Appendix B - Bid Form

161-18 Northside Generating Station Unit 3 Non-Segregated Bus Cryogenic Clean and Inspection

Submit an **original, two (2) copies and one (1) CD or thumb drive** along with other required forms in a sealed envelope to: JEA Procurement Dept., 21 W. Church St., Bid Office, Customer Center, 1st Floor, Room 002, Jacksonville, FL 32202-3139.

Company Name: _____

Company's Address _____

License Number: _____

Phone Number: _____ FAX No: _____ Email Address: _____

BID SECURITY REQUIREMENTS

- None required
- Certified Check or Bond Five Percent (5%)

TERM OF CONTRACT

- One Time Purchase
- Annual Requirements
- Other, Specify - Project Completion

SAMPLE REQUIREMENTS

- None required
- Samples required prior to Response Opening
- Samples may be required subsequent to Bid Opening

SECTION 255.05, FLORIDA STATUTES CONTRACT BOND

- None required
- Bond required 100% of Bid Award

QUANTITIES

- Quantities indicated are exacting
- Quantities indicated reflect the approximate quantities to be purchased Throughout the Contract period and are subject to fluctuation in accordance with actual requirements.

INSURANCE REQUIREMENTS

Insurance required

PAYMENT DISCOUNTS

- 1% 20, net 30
- 2% 10, net 30
- Other _____
- None Offered

Description of Services	TOTAL EVALUATED BID PRICE
Total Evaluated Bid Price for Work as described in this Solicitation from Page 2 of the Bid Form	\$ _____

I have read and understood the Sunshine Law/Public Records clauses contained within this solicitation. I understand that in the absence of a redacted copy my proposal will be disclosed to the public "as-is".

BIDDER CERTIFICATION

By submitting this Bid, the Bidder certifies that it has read and reviewed all of the documents pertaining to this Solicitation, that the person signing below is an authorized representative of the Bidding Company, that the Company is legally authorized to do business in the State of Florida, and that the Company maintains in active status an appropriate contractor's license for the work (if applicable). The Bidder also certifies that it complies with all sections (including but not limited to Conflict Of Interest and Ethics) of this Solicitation.

We have received addenda

_____ through _____

_____ Handwritten Signature of Authorized Officer of Company or Agent _____ Date

_____ Printed Name and Title

Appendix B - Bid Form
 161-18 Northside Generating Station Unit 3 Non-Segregated Bus Cryogenic Clean and Inspection

Unit	Description	# Required	Price \$ Total
1	Lump Sum for Scope of Work described in this solicitation	1 Lot	\$
Additional Materials, options for execution based on discovery during performance of the project: Pricing includes installation of <u>total</u> quantity listed below.			
2	Copper/Silver re-plating of electrical connections (See Figure 1 below)	24 Ea.	\$
3	Replace cracked/damaged insulators	18 Ea.	\$
4	Replace cracked/damaged Generator-Isophase, Isophase-Aux Transformer, Isophase-Main Transformer(s) seals (1 set = 3 phase (A,B,C) per location)	5 Sets.	\$
Total Evaluated Bid Price (total of Lines 1 through 4) Enter this Total on the Bid Form, Page 1			\$

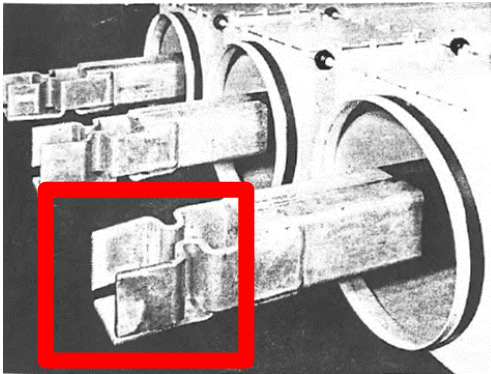


Figure 1 - Plating of Conductor Stab

Base silver plating cost on up to 100 square inches each. This is an approximate surface area to silver plate one end of one conductor/stab. Pricing includes all labor, materials and equipment to remove, plate and reinstall.