

064-18 Appendix A - Combustion Turbine Borescope Inspection Services

TECHNICAL SPECIFICATIONS

1.0 SCOPE OF WORK

- 1.1. JEA is seeking a qualified vendor to perform combustion turbine borescope inspection services at its electric plant facilities. JEA intends to award a single contract for this work.

2.0 ELECTRIC PLANT LOCATIONS AND FRAME TYPES

- 2.1 The list of JEA electric plant locations and frame types to be inspected are listed below. All electric plant facilities are located in Jacksonville, Florida.

Electric Plant Locations

- 2.1.1 Brandy Branch Generating Station (BBGS)
15701 West Beaver Street
Jacksonville, FL 32234
- 2.1.2 Kennedy Generating Station (KGS)
4215 Talleyrand Avenue
Jacksonville, FL 32206
- 2.1.3 Greenland Energy Center (GEC)
6850 Energy Center Drive
Jacksonville, FL 32256
- 2.1.4 Northside Generating Station (NGS)
4377 Heckscher Drive
Jacksonville, FL 32226

Frame Types

Plant Name	GE Frame Type
BrandyBranch CT1	7FA
BrandyBranch CT2	7FA
BrandyBranch CT3	7FA
Kennedy CT 7	7FA
Kennedy CT 8	7FA
Greenland CT1	7FA
Greenland CT2	7FA
Northside CT3	7B
Northside CT4	7B
Northside CT5	7B
Northside CT6	7B

3.0 CONTRACTOR SAFETY

- 3.1 **IT IS EXTREMELY IMPORTANT THAT THE CONTRACTOR AND JEA WORK TOGETHER TO ADDRESS ANY SAFETY CONCERNS SUCH THAT POTENTIAL ACCIDENTS ARE AVOIDED.**
- 3.2 All employees of the Contractor, who perform work on JEA property, shall be JEA Safety Qualified. Contractor Supervisors/Foremen will be required to attend the Safety Leadership Development program offered through the Northeast Florida Safety Council (NEFSC) or an equivalent program as required by the JEA Contractor Safety Program.
- 3.3 Site specific training shall be required to work at each electric plant location. The JEA Safety Department or JEA Representatives will provide a PowerPoint Training module for the site location. Contractor is responsible for ensuring ALL personnel have received the appropriate safety training, as required by JEA Contractor Safety Program, and shall submit a roster of the employees who received the training.
- 3.4 Contractors are required to wear Personal Protective Equipment (**PPE**) at all times while on all JEA electric plant sites. **PPE** shall include, but not be limited to, the following; safety glasses, hard hats, hearing protection, safety-toed boots, etc. **The cost of all PPE shall be included in the pricing.**
- 3.5 Contractor shall abide by the JEA Hot Work Permit Program, Lock Out/Tag Out Procedure and the Confined Space Entry Procedure.
- 3.6 Contractor shall abide by the JEA Contractor's Safe Work Practices Manual.

4.0 SECURITY

- 4.1 Contractor shall supply a list of names of the personnel they will be using during a given inspection project to the JEA Representative one (1) week prior to start of the project so they can secure their access into the plant. **Photo ID's are required for all personnel that will be working on JEA property.**
- 4.2 Only authorized Contractor personnel shall have drive-on plant access. Contractor shall be responsible for transporting their personnel from the JEA designated parking area to their work area.
- 4.3 A JEA issued security badge shall be visible at all times while on JEA property.
- 4.4 Background checks and mandatory training may be required for entry to NERC regulated spaces.
- 4.5 Parking on JEA property shall be approved through the JEA Representative. Parking for Company vehicles and Company personnel vehicles is limited to four (4) vehicles within the NGS facility. All Company vehicles driven onto plant sites must be properly identified with Company placards. Additional parking for personnel is available off-site in the designated Contractor parking area.

5.0 ENVIRONMENTAL

- 5.1 JEA is under strict environmental standards with respect to all construction activities, including purchasing, delivery, erection, and operation / maintenance of equipment.
- 5.2 Violations of standards may result in fines against and/or imprisonment of the guilty parties. The Contractor's work shall be in compliance with all applicable environmental standards. The Contractor is liable for breeches of permit conditions instigated by its personnel.
- 5.3 JEA shall assist the Contractor in environmental compliance by providing information upon request and monitoring the work. Environmental standards are contained in permits, permit application materials, Conditions of Certification, stipulations, and compliance documents. Copies of these documents are available for inspection at the JEA Environmental Compliance office. The Contractor shall cooperate fully with JEA in insuring compliance.

6.0 7FA BORESCOPE INSPECTION TYPES

- 6.1 **Standard Comprehensive Borescope Inspections** for GE 7FA units shall include, but not be limited to, the following components:
 - 6.1.1 **Inlet Bellmouth and Compressor**
 - A general inspection of the Inlet Bellmouth area.
 - A general inspection of the Variable Inlet Guide Vanes and Bushings.
 - Inspection of the stage 0 through 13 rotor blades and stator vanes at four cardinal locations via access through the Variable Inlet Guide Vanes.
 - A cursory stator vane segment shim inspection performed per IAW TIL 1562.
 - Inspection of the stage 14 through 17 rotor blades and stator vanes through the borescope ports in the compressor case.
 - Inspection of the stage R-13 through R-17 rotor blades per IAW TIL 1502-2.
 - A cursory inspection of the stage 17 compressor wheel per IAW TIL 1971 and 1972.
 - Inspection of the stage S-17 stator vanes and the Exit Guide Vanes per IAW TIL 1315-2R1 (manways or air extraction flanges must be opened).
 - 6.1.2 **Combustion Section**
 - Inspection of the fuel nozzles along with the "hot side" of the combustion liners, crossfire tubes and transition pieces (including the floating and side seals) with access as follows:
 - Liner and Transition Piece numbers 2, 3, 11-14 shall be inspected through the igniter and flame scanner ports.
 - Liner and Transition Piece numbers 1, 4-10 shall be inspected through either the DLN probe ports or through fuel blank ports (Gas Only). Alternate access to these liners can be obtained through adjacent crossfire tubes.
 - Inspection of the "Cold Side" Transition Piece when the manways or air extraction flanges are opened.
 - 6.1.3 **Turbine and Exhaust Section**

- Inspection of the turbine stage 1 through 3 Nozzles and Buckets through the borescope ports in the turbine case and via the exhaust section.
- Inspection of the stage 1 nozzles per IAW TIL 1108-R1.
- Inspection of the stage 1 bucket platforms for cracks and for wear on the tip shrouds.
- A cursory inspection of the stage 2 bucket tip shrouds per IAW TIL 1858/59/63.
- A general inspection of the exhaust section including the flex seal and exterior of the struts.

6.2 7FA TIL 1303-1R4 (R0 Molds)

- R-0 erosion molds will be taken at the leading edge of 4 stage R-0 rotor blades.
- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- Price shall include Mold evaluation by Contractor, to include four (4) samples.

6.3 7FA TIL 1509-R3 (In-Situ R-1 Only Visible Dye Penetrant)

- A visible dye penetrant examination through the VIGV's **without unit disassembly** is performed on the stage R-1 rotor blade tips to identify radial cracks.
- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- Price includes up to ten hours per shift to complete the inspection.

6.4 7FA TIL 1509-R3- (In-Situ R-0 and R-1 Visible Dye Penetrant)

- A visible dye penetrant examination through the VIGV's **without unit disassembly** is performed on the stage R-0 and R-1 rotor blade tips to identify radial cracks and the leading edge of the R-0 rotor blade platforms to identify root distress.
- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

6.5 7FA TIL 1509-R3 (In-Situ R-0, R-1 and S-0 Visible Dye Penetrant)

- A visible dye penetrant examination through the VIGV's **without unit disassembly** is performed on the stage R-0 and R-1 rotor blade tips to identify radial cracks and on the trailing edge of the stage S-0 stator vanes to identify axial cracks.
- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

6.6 7FA TIL 1638-R2 (In-Situ R0 and R1 Platform Phased Array Ultrasonic)

- A phased array ultrasonic examination is performed through the VIGV's **without unit disassembly** on the stage R-0 and R-1 rotor blade platforms to identify cracks.
- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.

6.7 7FA TIL 1638-R2 (In-Situ R1 Only Platform Phased Array Ultrasonic)

- A phased array ultrasonic examination is performed through the VIGV's **without unit disassembly** on the stage R-1 rotor blade platforms to identify cracks in the dovetail area.

- This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- 6.8 **7FA TIL 1907 (In-Situ Stage R-0 Rotor Forward Shaft Phased Array Ultrasonic)**
- A phased array ultrasonic examination is performed through the VIGV's **without unit disassembly** on the stage R-0 rotor forward shaft to identify cracks.
 - This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- 6.9 **7FA In-Situ Stage S-0 and S-1 Stator Vane Eddy Current**
- An eddy current examination is performed on the leading and trailing edge of the stage S-0 stator vanes and the 4 inches closest to the leading edge tips of the stage S-1 stator vanes where cracks have been identified in the fleet. This inspection should include the area deemed suspect to harmonic induced cracking.
 - This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.
- 6.10 **7FA In-Situ Stage S-0 Stator Vane Eddy Current**
- An eddy current examination is performed on the leading and trailing edge of all the stage S-0 stator vanes. This covers the area deemed suspect to harmonic induced cracking.
 - This inspection requires the VIGV's to be opened 100%, the actuator arm disconnected, and the lube oil & hydraulic systems tagged/locked out.

7.0 7EA/B BORESCOPE INSPECTION TYPES

- 7.1 **Standard Comprehensive Borescope Inspections** for GE 7EA/B units shall include, but not be limited to, the following components:

7.1.1 Inlet Bellmouth and Compressor

- A general inspection of the Inlet Bellmouth area.
- A general inspection of the Variable Inlet Guide Vanes and Bushings.
- Inspection of the stage 1 through 16 rotor blades and stator vanes at four cardinal locations via access through the Variable Inlet Guide Vanes.
- A cursory stator vane segment shim inspection performed per IAW TIL 1562.
- Inspection of the stage 17 rotor blades, stator vanes, Exit Guide Vanes 1 & 2 through the borescope ports in the compressor case.
- Inspection of the stage R-17 rotor blades per IAW TIL-1090-2 R1.
- Inspection of the stage S-17 stator vanes and the Exit Guide Vane 1 & 2 Ring Rails per IAW TIL 1744.

7.1.2 Compressor Section

- An inspection of the fuel nozzles along with the "hot side" of the combustion liners, crossfire tubes and transition pieces (including the floating and side seals) with access as follows:
 - Liner and Transition Piece numbers 2-4 and 7-9 shall be inspected through borescope ports in the side of the cans.

- Liner and Transition Piece numbers 1, 5, 6, and 10 shall be inspected through adjacent crossfire tubes.

7.1.3 **Turbine and Exhaust Section**

- The turbine stage 1 through 3 nozzles and buckets shall be inspected through the borescope ports in the turbine case and via the exhaust section.
- The stage 3 bucket tip shrouds shall be inspected per IAW TIL 1067-R3.
- A general inspection of the exhaust section including the flex seal and exterior of the struts shall be performed.

7.2 **7EA/B TIL 1884 (In-Situ R1 Rotor Blade and S1 Stator Vane Visible Dye Penetrant)**

- Perform a visible dye penetrant examination through the VIGV's **without unit disassembly** on the stage R-1 rotor blades and the entire suction side of the stage S-1 stator vanes to identify axial cracks.
- The inspection will require the VIGV's to be opened 100%, the actuator arm disconnected and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

7.3 **7EA/B TIL 1980 (In-Situ S-1 Suction Side Eddy Current)**

- An eddy current examination through the VIGV's **without unit disassembly** is performed to inspect for cracks on the suction side of the Stage S-1 stator vanes made of type-403 stainless steel, regardless of whether clashing is in evident on S1 and R1 airfoils.
- The inspection will require the VIGV's to be opened 100%, the actuator arm disconnected and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

7.4 **7EA/B TIL 1854 (In-Situ R-1, R-2, and R-3 Visible Dye Penetrant)**

- Perform a visible dye penetrant examination through the VIGV's **without unit disassembly** on the stage R-1, R-2, and R-3 rotor blade tips to identify radial cracks.
- The inspection will require the VIGV's to be opened 100%, the actuator arm disconnected and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

7.5 **7EA/B TIL 1562-R1 (In-Situ S-1 Stator Vane Shim Material Removal or Shim Extraction)**

- The price for this work shall include up to ten hours per shift to complete the removal of the protruding stage S-1 shim material or a complete shim extraction.
- The inspection will require the VIGV's to be opened 100%, the actuator arm disconnected and the lube oil & hydraulic systems tagged/locked out.
- Price shall include up to ten hours per shift to complete the inspection.

8.0 **WORK HOURS**

- #### 8.1
- Straight Time (ST) hours are performed from eight (8) to twelve (12) hours per day (the "Normal Work Day"), not to exceed forty (40) hours per week (the "Work Week"). A Normal Work Day may take place during the day, afternoon, or night shift.

- 8.2 Overtime (OT) hours are performed outside of a Normal Work Day or Work Week, including weekends and holidays. Overtime shall be approved in advance by the JEA Representative and shall be paid after an employee has worked forty (40) hours for the Work Week or worked more than the Normal Work Day.
- 8.3 Contractor shall not be permitted to perform overtime work without prior approval of the JEA Representative.

9.0 PAYMENT METHODS

9.1 Lump Sum Payment Method

- 9.1.1 JEA will pay the Contractor a Lump Sum amount for each borescope inspection that is performed. Payment amounts will be in accordance with the inspection rates established in the Respondents Rates Workbook. During the course of contract term, any new types of inspection or specialty type inspections for which rates have not been established may be performed as long as the parties come to a mutually agreeable cost for these inspections.
- 9.1.2 Borescope inspection prices shall remain fixed for the first three (3) years of the contract. Thereafter, the Contractor may request a Consumer Price Index (CPI) adjustment annually per the contract Terms & Conditions.
- 9.1.3 Upon completion of each borescope inspection, the Contractor shall submit an invoice per the JEA Purchase Order instructions.

9.2 Cost Reimbursable / Time & Material (T&M) Payment Method

- 9.2.1 **T&M Pricing**
 - 9.2.1.1 JEA shall pay the Contractor for T&M work in the manner set forth below and the compensation provided shall constitute full payment for the work.
 - 9.2.1.2 Pricing of all T&M work shall be based on the Labor, Travel, and Material unit prices and markups established in the Respondent Rates Workbook.
 - 9.2.1.3 The Contractor and the JEA Representative shall compare records of the work performed on a T&M basis at the end of each day, or as appropriate. These records containing time sheets, material receipts, etc. shall be prepared the next day by the Contractor and signed by the Contractor Representative. A copy of these records shall be submitted to JEA the same day, but no later than the next day, for approval and signed by the JEA Representative. A complete copy of these records for the work shall be submitted with the invoice.
- 9.3 **T&M Invoice Details**
 - 9.3.1 Upon completion of each borescope inspection, the Contractor shall submit a Preliminary Invoice to the JEA Representative for approval. The preliminary invoice shall contain, at a minimum, the following backup documentation:
 - 9.3.2 JEA Purchase Order number.
 - 9.3.3 JEA Electric Plant Description, i.e., electric plant location and Unit #.

- 9.3.4 Invoice number.
- 9.3.5 Invoice billing period.
- 9.3.6 JEA Task Manager
- 9.3.7 Borescope Inspection Type(s).
- 9.3.8 Invoice summary for each borescope inspection, to include line item expenses for overtime, materials, travel, and miscellaneous job-related expenses with totals for each.
- 9.3.9 Daily timesheet and material usage sheet signed off by the JEA Representative.
- 9.3.10 Per Diem & Travel expense sheet for each employee. All Per Diem & Travel requests shall be compliant with the JEA Contractor Travel Procedure.
- 9.3.11 Receipts for Material purchases.
- 9.3.12 Other backup documentation, as deemed necessary to verify accuracy of billing.
- 9.3.13 Upon approval by the JEA Representative, a final invoice shall be submitted per the JEA Purchase Order instructions.
- 9.3.14 Final invoicing shall be submitted within sixty (60) days of task completion.
- 9.4 **Hourly Overtime Labor Rate**
 - 9.4.1 The Hourly Overtime Labor Rate will be utilized for work performed in excess of a Normal Work Day, including weekends and holidays.
 - 9.4.2 The Hourly Overtime Labor Rate shall remain fixed during the five (5) year contract duration.
- 9.5 **Per Diem and Travel**
 - 9.5.1 All Per Diem and Travel reimbursement shall be in accordance with the JEA Contractor Travel Procedure. All expenses shall be billed at cost and shall require receipts for each. Mileage reimbursement shall be billed at current IRS Mileage Rate.
- 9.6 **Hourly Travel Rate**
 - 9.6.1 An Hourly Travel Rate will be allowed for emergent work or work which requires immediate dispatch of Contractor employees to the JEA jobsite.
 - 9.6.2 The Hourly Travel Rate shall represent the actual travel hours spent by the employee(s) to get to the JEA jobsite.
 - 9.6.3 The Hourly Travel Rate shall remain fixed during the five (5) year contract duration.
- 9.7 **Materials & Consumables Mark Up**
 - 9.7.1 For materials and consumables purchased by the Contractor and used in the execution of the Work, the Contractor shall be paid the actual cost of such materials and consumables, including sales taxes, if required, and freight and delivery charges as shown by original receipted bills. A mark-up amount shall be added to these costs, but shall not be added to applicable sales tax, expedite charges, delivery or freight

charges. The mark up amount shall equal the "Materials & Consumables Mark Up" as stated in the Respondent Rates Workbook. The Mark Up amount shall not exceed 10%.

10.0 EXIT INTERVIEW

An exit interview with electric plant personnel shall be conducted to review any and all findings on each day of the borescope inspection(s).

11.0 INSPECTION REPORTS

Following each borescope inspection, the Contractor shall supply a detailed written report to include the following:

- 11.1 A description of the inspections performed and any GE TIL's that are satisfied per the inspections.
- 11.2 Hi-resolution digital photographs (minimum resolution of 1290 x 960) of each stage of the compressor and turbine including any problem or potential problem areas. These photographs shall be laid out in a way that orients the unit from compressor to exhaust with all pictures aligned as if you were looking straight at the blade/bucket.
- 11.3 A summary of urgent findings as a result of the inspection and recommendations for follow up inspections.
- 11.4 The report shall be submitted in electronic format, preferably via email or file drop utility, complete with digital images embedded in the report. Copies of the report shall be submitted to the CT Operations & Maintenance Managers.
- 11.5 Final reports shall be turned in within 14 days of completing the borescope inspection.

064-18 APPENDIX B MINIMUM QUALIFICATION FORM
Combustion Turbine Borescope Inspection Services

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 Respondent shall have successfully completed or be in the performance of two (2) similar service contracts in the United States, in the past five (5) years date ending the Response Due Date.
- A similar service contract is defined as combustion turbine borescope inspection services contract totaling \$30,000.00 or more for any one (1) year period for each contract. If the contract is currently being performed, one (1) year of spend totaling \$30,000.00 or more must have already been completed to meet the minimum qualification.
- Additionally, the service contracts submitted shall be from different customers and the services shall have performed by the Prime Contractor on either GE 7FA or GE 7EA/B combustion turbine units.

064-18 APPENDIX B MINIMUM QUALIFICATION FORM

Combustion Turbine Borescope Inspection Services

Reference _____ of _____

Primary Nature of Service Provided: _____

Location: _____

Customer: _____

Reference Name: _____

Reference Phone Number: _____

Email Address: _____

Project Value: _____

Description of Project:

[illegible]

064-18 APPENDIX B BID FORM

Combustion Turbine Borescope Inspection Services

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

Item No.	ENTER YOUR BID FOR THE FOLLOWING DESCRIBED ARTICLES OR SERVICES	TOTAL BID PRICE
1	Total Bid Price	\$ _____

☐ 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