JEA Electric Production: Brandy Branch Generating Station HRSG Inspection Services Request for Quote

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1. Purpose

JEA is requesting a quote for HRSG inspection services for the two Nooter Eriksen HRSG's located at JEA's Brandy Branch Generating Station. JEA intends to award a single contract for 1 year with the option of extending for up to four additional years.

2. Site Information

JEA Brandy Branch Generating Station (BGS) is located at 15701 West Beaver Street, Jacksonville, Florida 32234. BGS includes a 2x1 combined cycle power block that consists of two GE frame 7FA model 7341 gas turbines, two Nooter Eriksen triple pressure heat recovery steam generators (HRSG), one GE D-11 steam turbine, and balance of plant (BOP) equipment. The HRSG's are equipped with SCR's for controlling NOx emissions and include duct burners for supplemental firing.

3. Scope of Work

3.1 Pre – Outage

3.1.1 The contractor shall attend a pre outage meeting to gain an understanding of the work that will be going on in conjunction of the HRSG inspection.

3.1.2 The contractor shall complete an online exterior inspection of both HRSGs and analyze online data 45 days prior to the start of the outage to determine an inspection priority of the various sections. Operating data can be provided by JEA at the contractor's request.

3.1.3 The contractor shall submit an inspection plan to JEA at least 30 days prior to the start of the outage for review and approval by JEA that details the inspection work to be completed during the outage.

3.2 Outage

3.2.1 JEA shall be responsible for lock out tag out (LOTO) of both HRSGs, opening and closing access doors, opening and closing borescope ports, evaluating the confined space atmosphere and providing hole watches. JEA shall also provide the contractor a copy of the "Brandy Branch Site Specific Safety Training" prior to the contractor's arrival onsite, and scaffolding if it is needed.

3.2.2 This specification covers the inspection of two Nooter Eriksen Heat Recovery Steam Generators (HRSG) at JEA's Brandy Branch Generating Station. The awarded contractor shall provide a visual inspection of both HRSGs that includes a report with photos, prioritized recommendations, and a discussion with plant personnel. Any recommendations shall include details to plan and complete repairs, including a materials list with quantities and a repair procedure for each recommendation.

3.2.3 The contractor shall provide two inspectors onsite to inspect the two HRSGs. The contractor shall work ten-hour shifts unless another shift is approved by JEA, and at least one of the inspectors shall be an engineer. The 2nd inspector may be a second engineer or a certified technician. The awarded contractor shall be responsible for their PPE, camera, and other inspection gear required to perform the work described in this section. All internal inspections of both HRSG's must be completed within 4 consecutive calendar days.

3.2.4 The contractor shall begin the inspection at the inlet of the transition duct system and finish at the exhaust stack. The normal HRSG inspection sequence would be an external inspection, gas side inspection, upper and lower dead air space inspections, waterside inspection (drums), and Flow Accelerated Corrosion (FAC) inspections. Each of these areas shall be inspected for thermal fatigue, corrosion, corrosion fatigue, quenching, overheating, gas lane plugging, and overstress. The inspection shall include the following items in Table 3-1.

Component	Action
Access Doors	Inspect sealing surfaces at the exterior for flatness, cracking, and bolt condition. Look for gaps in the door to the liner and missing. Inspect gasket condition.
Exhaust gas path/liner system	Check for movement of the channels, missing hardware, broken studs, condition of welds, sheared studs, exposed insulation, and cracking.
Gas side baffles	Inspect all attachments and look for contact with any other components. Look for loose, damaged, cracked or misaligned baffles. Evaluate for any gas bypass due to missing or misaligned baffles.
Lower and upper penetration seals	Inspect the interior for debris or other flow blockage and look for signs of corrosion. Inspect the exterior for cracking, tears, gas leaks and discoloration. Document any that are deficient and mark clearly the location on a drawing including the piping size.
Duct burners	Inspect for structural integrity and gas nozzle blockage of any kind. Check for any loose or cracked duct burner hardware. Look for presence of coking. Check the condition of the side wall liners and tubes downstream for any evidence of flame impingement of overheat.
Tubes and fins	Inspect for damage, corrosion, and debris. Look for bends and bowing of tubes. Ensure tube supports are secure. Look for any evidence of leaks such as unusual deposits or unusual patterns. Visually inspect accessible tube to header welds for any crack indications. Look for unusual deposits on the tubes or fouling. Take a representative close-up photo of each tube bundle accessible for comparison.
Headers	Inspect for cracking and damage. Report any distortion or movement.
Upper and lower gas side crawl spaces	Inspect for damage.
Steam drums and manways	Inspect for cracking, debris, plugging, and wear. Inspect for mechanical integrity of all fasteners. Note any deposits observed including quantity and take a sample. Note the coloration of the drum surface. Inspect all welds visually. Inspect the drum door and

	manway sealing surfaces for absence of any damage. Inspect steam separator equipment – look for any damage, gaps deposits. Measure the water line relative to drum centerline for comparison to design drawings. Inspect for any thinning of components
External casing and all penetrations	Inspect for signs of distortion and hot spots. Check all penetrations for cracking and deflection. Check expansion joints for any breaches. Check structural hangers and supports for any signs of premature failure.
Upper and lower dead air space	Inspect for accumulation of rust and debris. Check supports for cracking and distortion. Report any leak indications Check for any unusual conditions such as bent/bowed drain pipes, link piping/sub feeders and circumferential pipe welds. Check tube support pinned connections.
Vibration supports	Inspect for cracking and distortion and look for any tube contact that could be causing wall loss due to fretting damage
Stack	Inspect drain for debris or other blockage. Also, look for signs of corrosion.
UT high wear areas	NDE areas that are susceptible to high wear and erosion including the LP drum belly pans and the exhaust stack near the floor to shell interface..

Table 3-1

3.3 Optional Work Scope

3.3.1 The contractor shall provide an option to borescope LP, IP and HP drum riser pipes, upper evaporator pipe sections and evaporator tubes that are accessible without cutting access into the drum belly pans to look for signs of flow accelerated corrosion (FAC), deposits and other unusual conditions. Shall JEA elect to perform a borescope of these areas, we shall provide drawings and details needed to do so. Borescope plugs will be removed and reinstalled by JEA. The contractor shall provide a borescope with a minimum length of 8.0 meters (26.2 feet). This work shall be completed in the same 4 day outage window as the base outage work scope as specified in section 3.2

3.3.2 The contractor shall provide an option to NDE the steam drum welds as defined by the reference drawings in section 5. All of the NDE will be focused on the exposed welds within the drum that do not require added work to gain access to. This job will not include any riser inspections as that would require cutting out belly pans to expose the underlying penetrations. This work shall be completed in the same 4 day outage window as the base outage work scope as specified in section 3.2

The welds shall be inspected with magnetic particle (drum weld seams and nozzles) and phased array testing (downcomers).

Any crack indications or welds that need cleaning shall be recorded with a paint stick and photos. JEA shall provide drawings for the contractor to ID and prioritize welds to NDE and provide drum weld preparation prior to the inspection.

The welds shall be cleaned prior to NDE being performed. Ensure proper FME of all openings prior to cleaning. All welds to be inspected shall be cleaned with a wire wheel.

Clean a 4" wide area of the shell, measured from toe of weld at the shell, 360 degrees around each weld tested. Clean a 2" wide area up the nozzle/drum shell interface, including the weld and nozzle wall OD, 360 degrees around. Clean a 6" wide area (3" on each side of weld centerline), 360 degrees on both shell-to-head circumferential welds per drum. On the manway to shell welds, clean a 3" wide area, 360 deg.

Brush off and vacuum all material/dust from the drum when weld prep is complete. Below are a list of welds to be NDE inspected:

Downcomer to shell welds (both sides) – Qty 3 total (2H P and 1 IP)

Upper & lower-level tap to shell welds (both sides) – Qty 14 total (8 HP and 6 IP)

Manway to head welds (both sides) – Qty 4 total (2 HP and 2 IP)

BFW to shell weld (both sides) - Qty 3 total (2 HP and 1 IP)

Shell to head welds (both sides) - Qty 4 total (2 HP and 2 IP)

Shell to shell welds (all) – Qty Unknown – guessing around 5 circumferential & 5 longitudinal welds per drum

Chem feed - Qty 1 total (HP only)

Continuous blow down - Qty 1 total (HP only, IP cannot be accessed due to belly pan penetration)

3.3.3 The contractor shall provide an option to inspect the desuperheaters and attemperators on both units. This work shall be completed in the same 4 day outage window as the base outage work scope as specified in section 3.2

3.3.4 The contractor shall provide an option to inspect the blowdown tanks on both units. This work shall be completed in the same 4 day outage window as the base outage work scope as specified in section 3.2

3.3.5 The contractor shall provide an option for on-site technical support for any repairs needed as a result of the inspection.

3.4 Post Inspection Reporting

3.4.1 The contractor shall immediately report any findings that will require repairs to JEA personnel so JEA can begin making required repairs.

3.4.2 An inspection closeout meeting shall be held no later than 24 hours after the internal inspection is completed to discuss inspection findings with plant personnel.

3.4.3 A final inspection report that includes all findings in every section inspected shall be submitted to JEA within 30 days of the completion of the on-site inspection.

4. Codes and Standards

The following codes and standards, as amended to date, are applicable under this contract:

- Occupational Safety and Health (OSHA)
- ASME Section V
- ASME Section IX
- ASTM E709
- NBIC Part 3

5. Reference Drawings

The following drawings can be used for mapping different areas for inspection:

- Attachment A: 201A072
- Attachment B: 201A074-201A078
- Attachment C: 201A102-201A113
- Attachment D: 201A212-201A216
- Attachment E: HRSG Bundle Layout

6. Minimum requirements

6.1 The contractor shall have successfully completed inspections on 24 HRSG's over the past three years. At least four of these inspections must have been performed on Nooter Eriksen triple pressure HRSG's. A successful inspection is defined as performing the work described in section 3.0 of this document for a gas turbine HRSG and providing references for each inspection.

6.2 References will be used to verify the scope of work performed and quality of work provided.

6.3 The contractor shall provide JEA with a sample inspection report to be evaluated.

6.4 The contractor must complete JEA's safety prequalification prior to award.

6.5 NDE inspector should be a certified level two inspector

7. Pricing

The contractor shall include a lump sum price for the items listed in Table 3.1 and additional pricing for each of the options listed in section 3.3. This pricing shall include any travel and mobilization cost. The contractor should assume there are four working days for the internal inspection to be performed on both HRSG's. Also, the contractor shall include an up-to-date rate sheet for NDE personnel and equipment.

8. Bid submittals

8.1 Bid pricing shall be submitted using appendix A

8.2 Bid references shall be submitted using appendix B

8.3 The contractor shall provide JEA with a sample inspection report to be evaluated that covers the work scope identified in sections 3.1, 3.2 and 3.3.

8.4 The contractor shall provide JEA with a narrative of their proposed inspection approach to be evaluated that covers the work scope identified in sections 3.1, 3.2 and 3.3. This shall also include inspection and NDE plans for each drum.

8.5 That contractor shall provide a list of all data JEA will be required to provide for the online assessment along with the timeframe it will be required to meet the pre outage assessment schedule as defined in section 3.1.

Appendix A
Brandy Branch Generating Station HRSG Inspection Services Request for Quote
Bid Pricing Submittal Worksheet

Bidder Company Name	
Bidder Point of Contact Name	
Bidder Point of Contact Email	
Bidder Point of Contact Phone	

Description	Bid Price Year 1	Escalation % Year 2	Escalation % Year 3	Escalation % Year 4	Escalation % Year 5
Lump sum price for Base Scope of work for performing services defined in section 3.1, 3.2 and 3.4 on both HRSG's during a single outage					
Lump sum price for optional borescope of all accessible drum riser pipes, evaporator tubes and upper evaporator pipe sections for a single HP drum per section 3.3.1					
Lump sum price for optional borescope of all accessible drum riser pipes, evaporator tubes and upper evaporator pipe sections for a single IP drum per section 3.3.1					
Lump sum price for optional borescope of all accessible drum riser pipes, evaporator tubes and upper evaporator pipe sections for a single LP drum per section 3.3.1					
Lump sum price for optional NDE of all drum welds for a single HP drum per section 3.3.2					
Lump sum price for optional NDE of all drum welds for a single IP drum per section 3.3.2					
Lump sum price for optional inspection of attemperator/desuperheater section 3.3.3					
Lump sum price for optional inspection of blowdown tank per section 3.3.4					
Hourly Rate for an engineer to provide technical support per section 3.3.5					
Hourly Rate for a certified technician to provide technical support per section 3.3.5					

Appendix B

Brandy Branch Generating Station HRSG Inspection Services Request for Quote
References worksheet

Bidder Company Name	
Bidder Point of Contact Name	
Bidder Point of Contact Email	
Bidder Point of Contact Phone	

	Reference Company Name/Site	# of HRSG's Inspected	Reference Company Contacts		GE 7FA CT Y/N	NE HRSG Y/N
			Name	Phone Number/Email		
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2						
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