Appendix A: Technical Specification B52 and B53 Flex Seal Replacement

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1.0 Location of Property

The property on which the work is required by this Specification is at the JEA Brandy Branch Generating Station located at 15701 West Beaver Street, Jacksonville, Florida 32234.

2.0 Scope of Work

2.1 This Specification covers all labor, supervision, materials, equipment, tools, and services necessary to remove the existing gas turbine exhaust flex seal system and install a complete replacement system on both HRSGs located at Brandy Branch Generating Station (BGS). Work shall include demolition, preparation, fabrication, installation, inspection, and turnover.

2.2 The work includes replacement of the following components, consistent with the system described in the HRST proposal:

- Complete set of flex seals (multi-layer arrangement).
- Seal frame assemblies including outer rings, studs, and associated hardware.
- Soft goods including fabric expansion joint and ceramic fiber insulation.
- All necessary fasteners, gaskets, and supporting components.

2.3 All work shall comply with applicable industry standards including NBIC, ASME, AWS structural welding requirements, and OSHA safety regulations. All Contractor procedures shall be subject to Owner review.

2.4 All required scaffolding, access platforms, confined-space permitting, electrical/mechanical isolations, and site utilities shall be provided by the JEA.

3.0 Existing Flex Seal Description

3.1 The existing flex seals were installed in 2016. The system consists of two layers of fifty (50) Inconel 718 0.04-inch flex plate, and one layer of twenty-five (25) Inconel 718 0.02-inch flex plate.

3.2 The exhaust gas flow for the GE Frame 7FA gas turbine is 3542 kpph with an average exhaust temperature of 1120 degrees F while operating on natural gas. The design internal temperature is 1250 F.

4.0 Demolition and Removal

4.1 Extreme care must be taken so that no damage is done to the JEA's station facilities that will remain in operation during the demolition work. It is emphasized that facilities located adjacent to and below grade in the working area are very essential elements of the plant. All such adjacent facilities must be kept guaranteed safe during all demolition and installation work. When possible, these facilities will be de-energized by JEA personnel. JEA will provide a mark-out of these facilities.

4.2 The Contractor shall erect and properly maintain at all times such danger signs, barricades, lights and other safeguards as may be required for safe working conditions.

4.3 All materials from the demolition become the property of the Contractor and shall be removed promptly from the site. Removal of debris from the site shall be done frequently so as to avoid any collection of debris.

4.4 The Contractor shall submit along with the bid proposal, the names of the sub-contractor(s), if any, who may be used for demolition, disposal, and installation. The Contractor shall also include the proposed disposal location for the material removed. The Contractor shall obtain the required permits necessary for the disposal of the removed material. The Contractor shall provide copies of disposal records/logs and certificate of recycle.

5.0 Replacement Flex Seal

5.1 The Contractor shall engineer, design, fabricate, deliver to the site and install a new replacement multi-layered flex seal system for two HRSGs. All interior components in contact with exhaust gases shall be at a minimum Type 409 stainless steel.

5.2 The Contractor shall fit and weld new seal frame outer rings to the diffuser duct casing, and gas turbine exhaust outer surface. The studs, frame sections, and hardware shall align with the predrilled holes in the leaf seals.

5.3 Install ceramic fiber blanket insulation between the gas turbine exhaust surface, casing, and the fabric expansion joint. Install new fabric expansion joint using Contractor supplied studs, nuts, and lock washers.

6.0 Material and Fabrication

6.1 Leaf Seals

- Material: Inconel 718, pre-cut to shape with pre-drilled holes matching bolt patterns.
- Quantity: 75 per unit (or as otherwise detailed).
- Configuration: 3-layer design with prescribed thickness variations.
- Fabrication: Shop fabricated; edges shall be smooth and burr-free.

6.2 Seal Frame Assembly

- Outer rings constructed to fit diffuser casing and turbine exhaust geometry.
- Studs pre-welded to frame per HRST design.
- Hardware (nuts, lock washers) provided as complete installation kit.

6.3 Fabric Expansion Joint

- Multi-layer high-temperature fabric suitable for 1200°F and +/- 2 PSIG HRSG exhaust conditions.
- Installed to accommodate thermal expansion and maintain gas tightness.
- Must be compatible with ceramic fiber blanket insulation.

6.4 Insulation

- Ceramic fiber blanket insulation designed for the maximum gas turbine exhaust temperature.
- Installed to fill void between turbine exhaust, casing, and fabric joint.

6.5 Fabrication

All supplied materials shall conform to the following:

- ASME material specifications for high-temperature alloys.
- Welds performed to AWS standards with certified procedures.
- Dimensions shall conform to provided drawings, unless change is approved by JEA engineering.

7.0 Welding and Fabrication Tolerances

7.1 Fabrication tolerances shall be in accordance with industrial standards and shall be in accordance with the Contractor's design drawings.

7.2 Quality and appearance of welding is extremely important and shall be in accordance with the practices and procedures of the AWS D1.1, Structural Welding Code, steel, and AWS D1.3, Structural Welding Code, Sheet Metal.

7.3 All surfaces to be welded shall be suitably prepared and free of all foreign materials detrimental to welding such as grease, oil, dirt and paint.

Proper welding electrodes shall be selected from AWS keeping in mind the base metal to be welded and the welding process to be used.

7.4 Only certified welders shall perform the welding.

7.5 Flatness of exterior sheet surfaces shall be within one-forth of an inch. Bolt hole location tolerance shall be plus or minus one-sixteenth of an inch. Unless otherwise noted on the design drawings, the inside bend radii for stainless steel parts shall be 3 times the plate thickness, minimum.

8.0 Protective Coatings

8.1 Shop Coating Spec
8.2 Remove all grease, oil, and foreign matter with Surface Cleaner # 3 in accordance with SSPC-SP1.
8.3 Follow with SSPC-SP10 Near White Blast Cleaning with a 1.0 to 3.0 mil profile.
8.4 Prime Coat Interior & Exterior: Carbozinc 11 Inorganic Zinc Green at 2.0 to 3.0 mils dft.
8.5 Finish Coat Exterior: Thermaline 4700 Silicone Finish Pearl Grey at 2.0 to 3.0 mils DFT.
8.6 Field Coating of Field Welded Areas
8.7 Remove all grease, oil, and foreign matter with Surface Cleaner # 3 in accordance with SSPC-SP1.
8.8 Follow with SSPC-SP10 Near White Blast Cleaning with a 1.5 to 2.5 mil profile.
8.9 Prime Coat: Thermaline 4765 at 2.0 mils DFT.
8.10 Finish Coat Exterior: Thermaline 4700 Silicone Finish Pearl Grey at 2.0 to 3.0 mils DFT.

9.0 Shipment

9.1 The Contractor shall be fully responsible for the safe shipment, storage and handling of the components, and shall be fully responsible for the material on the job site until the system is turned over to the Plant. The contractor is responsible for all shipping costs and for all truck loading and unloading of material at the job site.

9.2 Miscellaneous parts shall be packed in suitable boxes for storage at the job site.

10.0 Documentation

10.1 Calculations

10.1.1 The Contractor shall submit design calculations for approval, prior to the start of fabrication. The Contractor shall verify the sound attenuation, the structural and thermal design characteristics of the exhaust stack.

10.1.2 The design calculations, and all other documentation listed herein, shall be submitted to the JEA Project Manager.

10.2 Shop Drawings

10.2.1 The Contractor shall submit to JEA for approval outline component drawings in Auto Cad format. The Contractor shall commence fabrication after the shop drawings are approved.

11.0 Reference Drawings and Manuals

11.1 Drawings:

GE Dwg No	Description
324B7582P001	
324B7582P002	
JEA Dwg. No.	Description
201A003	Inlet Expansion Joint
201A005	Inlet Expansion Joint
201A007	Inlet Expansion Joint Design
201A074	Inlet Duct Wall Liner Layout
201A075	Inlet Duct Floor Liner Layout
201A076	Inlet Duct Roof Liner Layout
201A164	Inlet Expansion Joint Safety Shroud
201A166	Inlet Expansion Joint Safety Shroud
201A168	Duct Box Inlet Expansion Joint
201A169	Inlet Expansion Joint Assembly
201A216	Plan & Elevation Views Of Duct Box
201A226	Inlet Duct 'A' Field Corner Angles For Face Plate Assembly Mk'014131-4a' Column D1
201A227	Inlet Duct 'A' Inlet Assembly Mk'014131-4a' Column D1

11.2 GE Reference Manuals

The maintenance manual of the General Electric Gas turbine Unit MS7000FA is available at Brandy Branch Plant. The Contractor shall design the replacement exhaust silencer by using the operating pressure and temperature and applicable loads. The exhaust silencer shall be checked for loads specified in ANSI/ASCE 7-2010.

12.0 Construction

12.1 Temporary Utilities

A. JEA will provide limited 110V - 20 ampere single-phase and 480V - 60 ampere three-phase electrical power at designated locations in the gas turbine area. Contractor shall be responsible for additional power supply (Generator) requirements and transformers to provide any other required voltages. Contractor shall make electrical connections and supply sufficient quantities and lengths of cables and electrical connectors in safe working order.

B. Service air for construction activities is not available.

C. Isolating and tagging out of equipment prior to work by the Contractor will be provided by JEA.

D. Contractor to provide designated trash dumpsters, labeled by debris type.

12.2 Laydown & Assembly Area

The Contractor shall notify the JEA Project manager of the size of their required laydown and assembly area. The laydown and assembly location will be determined jointly by the JEA Project Manager and Contractor.

12.3 Project Schedule

A. The tentative outage schedule for Brandy Branch CT1 will be provided once the equipment fabrication time, shipping duration and assembly time is known.

B. Contractor shall provide the JEA Project Manager a detailed resource loaded project schedule within 2 weeks of award. Schedule shall outline all project details including but not limited to: Mobilization, Assembly, demobilization.

C. The project schedule for this Contract shall be prepared and maintained by Contractor to provide coordination between subcontractors and suppliers, to establish the basis for measuring and monitoring Contractor progress and overall Project progress, to detect problems for the purpose of taking corrective action.

Project Meetings

A. Once Contractor has mobilized to Jobsite, JEA and Contractor representatives shall meet daily to update the following:

Current status of the job progress

Look-Ahead Schedule (requirements listed in Item B. below)

Current and projected manpower

Changes in the Work

Safety and Quality Control issues

Problem areas or concerns

B. The Look-Ahead Schedule shall:

Report all planned work that is to be accomplished during the current week and the next two weeks in support of, and in accordance with, Contractor's detailed Construction Schedule

Be personnel and resource loaded

Report the planned and actual progress of the previous week

Report critical activities that are identified to be completed by others, the delay of which would prevent Contractor from starting and completing its planned work activities in accordance with the detailed Construction Schedule