

Appendix A - Technical Specifications
B52 and B53 Final Transition Duct Liner System Replacement

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1.0 Location of Property

JEA Brandy Branch Generating Station is located at 15701 West Beaver Street, Jacksonville, Florida 32234.

2.0 Scope of Work

2.1. This specification covers the engineering, design, fabrication, and installation of sections G, H and J of the transition duct liners for two gas turbine units as described herein. This specification also covers demolition and removal of the existing liner in G, H, and J sections of the transition duct on each gas turbine. The awarded Company is to furnish all labor, supervision, material, cranes, subcontractors, scaffolding, etc. to engineer, design, fabricate, deliver to the site, unload, and install new replacement liner, hardware, and insulation system for the last three sections of each Heat Recovery Steam Generator (HRSG) transition duct in its entirety (4 surfaces).

2.1.1. The Company shall remove and dispose of the existing transition duct liner and insulation system in the sections that are being replaced. The Company shall provide all material and labor for installation of the new liner and insulation in the specified transition duct sections. The interior liner surfaces shall be 10 GA 409SS panels with pre-cut stud holes.

2.1.2. The Company shall take every precaution to not damage the existing structural steel support system. It is intended that this support system will be reused and

that the new transition duct liner sections will fit and connect to the existing structure as they now exist

- 2.1.3. The Company shall remove the liner and insulation in the transition ductwork starting at column D7 and finishing at the expansion joint just downstream of column D10. The Company will be allowed to make a temporary window to remove material from the interior of the transition duct but shall be responsible for restoring the transition duct upon completion of all interior work.
- 2.1.4. All liner and insulation system upstream from column D7 has previously been replaced. Care shall be taken to avoid any damage to existing system. Any damage shall be repaired by contractor.
- 2.1.5. The intention is that the expansion joint downstream of column D10 where the liner transition replacement should end will be reused. Care shall be taken to avoid any damage to existing system. Any damage done to the expansion joint by contractor shall be covered and repaired by contractor.

3.0 Codes and Standards

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

- Codes, Rules and Regulations of the State of Florida
- Occupational Safety and Health (OSHA)
- 29 CFR Parts 1926.1101, 1926.62 and 1926.850 through 1926.859
- American Society for Testing and Materials (ASTM)
- A-36 Structural Steel
- A-240 Stainless and Heat-Resisting Chromium Steel Plates, Sheet and Strip
- A-285 Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength
- A-325 High-Strength Bolts for Structural Steel Joints
- Steel Structures Painting Council (SSPC) Surface Preparation as Specified
- American Welding Society (AWS) Structural Welding Code, Steel (AWS D1.1)
- American Welding Society (AWS) Structural Welding Code
 - Sheet Metal (AWS D1.3)
- American Institute of Steel Construction (AISC)
 - Manual of Steel Construction, 13th Edition
- American Society of Civil Engineers (ASCE)
 - ASCE Standard ANSI/ASCE 7-2010
- American National Standard
 - ANSI B133.8 “Gas Turbine Installation Sound Emissions”

4.0 Existing Transition Duct Description

- 4.1. The existing transition duct for Unit 52 and Unit 53 are located downstream of the turbine exhaust, between the gas turbine and HRSG. There has been deterioration to the internal liner and insulation due to thermal stress, corrosion, and erosion from exhaust emissions.
- 4.2. The general dimensions of the transition duct and diffuser duct liner are shown on the reference drawings by Nooter/Eriksen. The diffuser liner can be seen on drawings provided, but dimensions will need to be verified. The replacement transition duct liner and insulation system shall be designed and fabricated to match the overall dimensions of existing components to ensure a proper fit. It is also required that transition duct utilize the existing structural steel support structure. The shell is constructed of ASTM – A36 steel. The shell plate is generally a minimum of 3/8” inch thick steel. All interior liner materials, exposed to hot gases, are 409 stainless steel. The insulation panels are approximately 8 inches thick.
- 4.3. The exhaust gas flow after .05 upgrade for the GE Frame 7FA gas turbine is 3718 kpph with an average exhaust temperature of 1210 degrees F. The design internal temperature is 1250 degrees F.

5.0 Demolition and Removal

- 5.1. The transition duct liner replacement will be done in conjunction with dual parallel Combustion Turbine (CT) Majors and Generator Majors/Rewinds well as other plant projects. The Company must use extreme caution as other Companies and equipment may enter and exit the work area. An air dam must be erected inside the duct during replacement activities to prevent fugitive dust and insulation fibers from migrating upstream to turbine area and downstream to the HRSG.
- 5.2. 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 safe during all demolition and installation work. When possible, these facilities will be de-energized by JEA personnel. JEA will provide a lock-out of these facilities.
- 5.3. The Company shall erect and properly always maintain such danger signs, barricades, lights and other safeguards as may be required for safe working conditions.
- 5.4. All materials from the demolition become the property of the Company and shall be removed promptly from the site. Removal of debris from the site shall be done frequently to avoid any collection of debris.

- 5.5. The Company is advised that some of the material to be disposed of will contain various insulation materials such as Birfelt, fiberglass, mineral wool, and fiberglass cloth.
- 5.6. The duct will be a permit required confined space. Contactor responsible for CSE permitting and monitoring. JEA requires all CSE Attendants to be CPR and First Aid Qualified.
- 5.7. Contractor shall use dust free means of removing insulating materials.
- 5.8. Hot work permits will be issued by JEA. Contractor will be responsible for required fire watches and fire extinguishers.

6.0 Hazardous Material Removal

6.1. Potential Asbestos Removal

- 6.1.1. It is not expected that the Company will encounter any asbestos containing material in the demolition of the existing liner systems. If the Company suspects that any components of the transition duct contain asbestos, the Company shall notify the JEA Project Manager. The Company is advised that any material suspected of containing asbestos will have to be treated as asbestos containing material until cleared by testing. The Company shall observe all safety standards and procedures required to handle potential asbestos in accordance with JEA Safety Procedures. **JEA shall arrange and be responsible for testing any suspected asbestos. JEA shall reimburse the Company additional costs associated with the finding of components containing or suspected of containing asbestos. The Company shall not include in its bid contingency funds for potential asbestos-related work.**

6.2. Painted Surfaces

- 6.2.1. The Company is advised that the existing transition duct is not coated with a lead containing paint system.

7.0 Replacement Transition Duct Liner and Insulation

- 7.1 The Company shall be fully responsible for the complete design and replacement of the existing transition duct liner including verification of interface field dimensions, analysis, aerodynamic and structural design. The Company shall design the replacement transition duct liner to fit on the existing supporting structural steel. The Company shall inspect the condition of the existing structural steel support frame for the replacement transition duct liner.

- 7.2 The Company shall engineer, design, fabricate, deliver to the site and install a new replacement transition duct liner and insulation system. The average external shell temperature shall not exceed 160 degrees F. Hot spots up to 10 degrees above the average are acceptable. The transition duct liner shall operate reliably in an ambient temperature range of minus 10 degrees F to 110 degrees F. In the event any exterior components need to be replaced, it shall be fabricated from ASTM A36 steel at a minimum. All interior components in contact with exhaust gases shall be at a minimum Type 409 stainless steel.
- 7.3 It is acceptable to cut a temporary window to remove the current liner and install the new liner. The window shall be restored to original condition when all interior work is complete.
- 7.4 The transition duct liner surfaces, hardware and components which come in contact with exhaust gases shall be per section 8.0. All nuts used shall be prevented from running off the studs by tack welding the nuts to the studs. To prevent top liner washers from cutting into studs they shall be tack welded to nuts.

8.0 Materials and Fabrication

- 8.1 The Company is responsible for the design and fabrication of the transition duct liner. Structural components of the design shall be in accordance with the applicable AISC, ASTM and related codes.
- 8.2 The following minimum material requirements shall be adhered to in the design and fabrication of exhaust transition duct liner and diffuser duct liner:
 - a. Exhaust transition duct shell plate shall be ASTM A36, 3/8" thickness.
 - b. Internal Liner shall be Type 409 stainless steel sheets, minimum 10 gage.
- 8.3 Interior hardware shall be machined studs 3/4" dia. 304SS with 304SS nuts. Top and bottom liner washers, pinpoint and guide washers, and liner corner angles shall all be 10 GA 304SS. The transition piece retaining clips shall be 304SS.
- 8.4 Insulation shall be 8" thick 8pcf ceramic fiber blanket rated at 2300 degrees F. Insulation can be compressed one inch to 7" thick during installation.

9.0 Welding and Fabrication Tolerances

- 9.1 Fabrication tolerances shall be in accordance with industrial standards and shall be in accordance with the Company's design drawings.

9.2 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.

9.2.1 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.

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

9.3 Only certified welders shall perform the welding.

10.0 Protective Coatings

10.1 Damaged areas of external coating shall be repaired in accordance with coatings specifications in attachment documents. Use COATING SYSTEM DATA SHEET SYSTEM A1.

11.0 Shipment

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

11.2 Hardware, and other miscellaneous parts shall be packed in suitable boxes for storage at the job site.

12.0 Documentation

12.1 The Company shall submit to JEA for the proposed liner and insulation system layout design.

13.0 Reference Drawings and Materials

JEA Drawing Number	Description
M010322-201A074 RD	Inlet Duct Wall Liner Layout
M010322-201A075 RC	Inlet Duct Floor Liner Layout

M010322-201A076 RC	Inlet Duct Roof Liner Layout
M010322-201A077 RA	Inlet Duct Field Seam Liners
M010322-201A078 RA	Inlet Duct Field Seam Corner Angles
M010322-201A216 RE	Plan And Elevation Views Of Duct Box
M010322-201A228 RA	Inlet Duct 'B', 'F', & 'H' Casing Assembly Diagram
M010322-201A229 RA	Inlet Duct 'B', 'F', & 'H' Corner Angle Installation Diagram
M010322-201A234 RA	Inlet Duct 'G' Assembly Diagram
M010322-201A235 RA	Inlet Duct 'G' Corner Angle Diagram
M010322-201A236 RB	Inlet Duct 'J' Assembly Diagram
M010322-201A237 RA	Inlet Duct 'J' Assembly Diagram
Coatings 60.0600	Coatings

14.0 Construction

14.1 Temporary Utilities

- 14.1.1 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. Company shall be responsible for additional power supply (Generator) requirements and transformers to provide any other required voltages. Company shall make electrical connections and supply sufficient quantities and lengths of cables and electrical connectors in safe working order.
- 14.1.2 Service air for construction activities is not available.
- 14.1.3 Isolating and tagging out of equipment prior to work by the Company will be provided by JEA.
- 14.1.4 Company to provide designated trash dumpsters, labeled by debris type.
- 14.1.5 Company to provide adequate sanitary facilities for all their personnel serviced at a minimum 3 times a week.
- 14.1.6 Company to provide any required break areas for personnel.

14.2 Laydown & Assembly Area

- 14.2.1 The Company 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 Company.

14.3 Project Schedule

- 14.3.1 The tentative outage schedule for Brandy Branch combined cycle is tentatively March 11, 2027 through April 18, 2027. The Company will have 38 days available to perform scope of work thus allowing operational shutdown, startup, and testing activities.

14.3.2 Company 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. It shall be in MPP format with copy in PDF format.

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

14.4 Project Meetings

14.4.1 Once Company has mobilized to Jobsite, JEA and Company representatives shall meet daily to update the following:

- a) Current status of the job progress
- b) Look-Ahead Schedule (requirements listed in Item B. below)
- c) Current and projected manpower
- d) Changes in the Work
- e) Safety and Quality Control issues
- f) Problem areas or concerns

14.4.2 The Look-Ahead Schedule shall:

- a) 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, Company's detailed Construction Schedule
- b) Be personnel and resource loaded
- c) Report the planned and actual progress of the previous week
- d) Report critical activities that are identified to be completed by others, the delay of which would prevent Company from starting and completing its planned work activities in accordance with the detailed Construction Schedule.