

104-19 Appendix A – Technical Specifications and Scope of Work

Combustion Turbine No. 6 Major, HGP and Compressor
Inspection and Repair

GE MS7001B

Jacksonville Electric Authority

Northside Generating Station

4377 Heckscher Drive

Jacksonville, Florida 32226-3099

Scope of Work

This is a request for bids to perform disassembly, equipment and parts cleaning, and re-assembly of one General Electric (GE) MS-7001 Frame 7B gas turbine (CT), designated Northside CT 6, serial number 237980. The scope of work will include the disassembly of the hot gas path and compressor. Disassembly, cleaning, and assembly shall be done following the GE outage manual methods or other approved method. All inspection data (disassembly and reassembly) shall be taken in accordance with the GE Maintenance Overhaul Manual and latest OEM recommendations. The scope of work will also include a major inspection, Non-Destructive Examination (NDE) where required, and repair of all damaged components. Once the components have been NDE'd and ground out and are ready for weld repair JEA may elect to send a representative to visit the shop. All components deemed to be scrap shall be returned to JEA. **All NDE shall be done on site.**

Background

JEA owns and operates four GE Frame 7B gas turbines operating on distillate fuel at the Northside Generating Station (NGS) in Jacksonville, FL. All four (4) CT's have had the Woodward Governor Control System Netcon 5000 control system upgraded with a GE Mark VI simplex control system.

Schedule and Time Frame of Work

The disassembly will begin August 31, 2019 and the contractor will be given 4 weeks to disassemble, perform inspections, NDE/NDT, and repair hot gas path components, and assemble the unit. Estimated outage completion is September 30th.

Turbine Rotor Replacement Parts

JEA will be soliciting bids of replacement parts listed in, listed in **Appendix A**. Replacement parts may be purchased from any Bidder at the discretion of JEA, and therefore parts listed in Appendix A are listed as a separate line item in the Bid form are not included in the evaluation of this bid for award.

JEA NGS Contacts

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Bidder Submittal if requested by JEA

The bidder must submit the following within 5 business days if requested by JEA or bid may be disqualified

- Bidder shall provide an electronic copy of the Bidder's corporate quality control manual for verification by JEA.
- Bidder shall supply a narrative work plan, accompanied by a preliminary procurement and construction schedule, including manpower loadings and project milestone dates.

NOTE: Failure to submit qualification information may eliminate the bid proposal from further consideration.

Project Management

Schedule

Bidder shall furnish a draft detailed construction schedule and narrative of the construction plan in Bidder's proposal. The construction plan shall include a plan for the detailed scope and shall highlight critical construction activities. The first update of the construction schedule shall be within 1 week after contract award and submitted in both PDF and MS Project. Updates shall be provided to the JEA Project/Construction Manager on a weekly basis, as a minimum, after mobilization on site.

Project Meetings

Once Contractor has mobilized to Jobsite, Owner and Contractor representatives shall meet Monday, Wednesday, and Friday (or similar schedule) each week to review the Work progress and update the Work completion schedule. Contractor's representative shall present the following:

- Current status of the job progress
- Review of daily log and activities to date
- Detailed one (1) week look-ahead schedule (see below)
- Current and projected manpower
- The material delivery and receiving status
- Any changes in the Work Scope
- Safety and Quality Control issues
- Problem areas or concerns
- Contractor shall keep meeting minutes and distribute to the participants.
- Contractor's one (1) week look-ahead schedule shall:
 - Indicate all planned work that is to be accomplished during the current week and the next week period in support of, and in accordance with, Contractor's detailed Construction Schedule
 - Be personnel-loaded
 - Reflect the planned and actual activities of the previous week
 - Include any activities that are required to be accomplished by others that would impact and/or prevent Contractor from starting and/or accomplishing its planned work.

Project Coordination Responsibilities

During the installation of this project, JEA will continue to operate the Northside facility and other auxiliary equipment at the Northside Generating Station. Contractor's work shall not interfere with the operation of JEA's operating equipment or the work of the Plant's operating personnel.

Contractor shall also consider that both JEA maintenance forces and other contractors may be working in the combustion turbine areas during this outage condition. Contractor shall cooperate with these other work forces at the direction of JEA to insure the scheduled work completion dates are met.

Project Scope of Work Clarifications

JEA has a contractor onsite support that could help provide scaffolding and safety barriers as required for the awarded Contractor's scope of work. Scaffolding and Safety barriers shall be the responsibility of the Contractor. Contact information is available upon request.

Contractor shall provide all tools, special tools, equipment, compressed air, dry storage, office, change room facilities, and adequate capacity crane, fork truck, vehicles to perform all phases of the work.

Contractor shall be responsible for the procurement of all permanent materials, ie, gaskets, seals, replacement/damaged bolting, Heli-coils, etc., this includes freight to the site and unloading and/or storage. Contractor shall be responsible for the procurement of all materials (permanent or temporary) needed for the proper installation of the Work.

Contractor shall provide all craft labor required to complete the work, including support crafts as required.

Drinking water and ice, hand washing stations, and break area shall be the Contractor's responsibility. Reuse water shall not be used.

JEA will provide limited compressed air and electrical power for Contractor's use.

JEA will provide 110V - 20 Amp, I - Ph and 480V - 60 Amp, 3 - Ph electrical power in the work area. Contractor shall be responsible for any additional power requirements. It shall be the responsibility of Contractor to make electrical connections, and supply any electrical connectors to make these connections. All connections shall be made by a Certified Electrical Contractor and be approved by the JEA Project/Construction Manager, prior to progressing with this work. Any additional construction lighting required to perform the work shall be provided by Contractor.

It shall be the responsibility of Contractor to disconnect/reinstall/replace any piping, structure, wiring, conduit, instrumentation, insulation, lagging, thermocouples, instrument tubing or related items which were removed by Contractor to aid him in his work; however, Contractor shall not de-energize/energize any station electrical or mechanical system. This shall be done in accordance with JEA Lockout/Tagout procedures and coordinated through the JEA Project/Construction Manager.

Isolating and tagging out (LOTO) of equipment prior to work by Contractor shall be coordinated through the JEA Project/Construction Manager and conducted by the operations group of NGS. Limited exceptions of additional signing personnel will be made with prior JEA approval only.

Contractor shall provide transportation from Contractors' parking to and from work location for craft personnel (0.7mi. in each direction. Contractor is limited to 2 vehicles on the Plant site. Additional vehicles will only be allowed on a special need basis and only with prior approval by the JEA Project/Construction Manager.

Removal and reinstallation of any equipment or platform to gain safe access to work area shall be the responsibility of Contractor. Removal of structural members will not be allowed without approval of the JEA Project/Construction Manager. Also, all removal must be agreed upon prior to commencement of work to insure proper Lockout/Tagout protocol and available access to necessary areas for plant personnel.

Contractor to establish work crews and provide list of personnel to Participant Contract Manager for plant entrance approval one week prior to coming on site. Work crews will be processed and badges provided before entering Participant's plant site. Participant will conduct the required on site safety meeting and any site specific safety meeting(s) for Contractor personnel. . Some of the Participant's will require work force documentation badging therefore the Contractor will be required to provide E-verify documentation and time for the employees badging process.

Clean Up

JEA will provide designated general trash dumpsters; JEA will empty the dumpsters as requested by the Contractor or will provide alternative dump area if dumpsters are not available, such as during weekends or holidays when dumpster service may not be available.

Contractor shall clean up all work areas on a daily basis. Contractor shall employ at least one clean-up laborer for every eight craftsmen on site. A final "top to bottom" clean up shall be performed at the completion of work to be approved by the JEA Project/Construction Manager.

Component Weight

Below are the weights of some of the major components

<u>Component Description</u>	<u>Weight (lbs)</u>
Air Inlet Casing	14,750
Turbine Casing w/Shrouds	10,410
Forward Compressor Casing	3,350
Aft Compressor Casing	2,850
Compressor Discharge Casing	8,500
Combustion Wrapper	8,000
Load Coupling	4,591
Exhaust Hood	10,000
Exhaust Diffuser	3,750
First Stage Nozzle	1,500
Inner Compressor Discharge Casing	1,550
Compressor Rotor	36,000
Turbine Rotor	26,000

Scope of Work for Disassembly

Basic Disassembly Outline: (Note all bolting and other hardware shall be labeled and stored in storage bins)

Contractor shall provide a daily log sheet of all activities undertaken, all data sheets and inspections performed, a daily photo log of work done, and any expected delays. Contractor shall provide a daily list of all bolting or parts damaged and needing replacement during disassembly for the purpose of expediting parts ordering, the contractor is responsible for the replacement of all materials.

Engine Compartment

- Remove the engine compartment walls
- Remove the engine compartment wall to intake expansion joint
- Remove the engine compartment wall to exhaust expansion joint
- Remove the engine compartment roof

Remove Instrumentation/Electrical

- Igniters
- Flame scanners
- Wheel-space thermocouples
- Exhaust thermocouples
- Engine compartment vent fan
- Engine compartment lights
- No 2 bearing thermocouples
- No 2 Bearing vibration detectors
- No 3 bearing thermocouples
- No 3 bearing vibration detectors
- 5th stage compressor bleed valve
- 11th stage compressor bleed valve

Turbine/Generator Bearing Oil Vent Piping

- Remove bearing oil vent piping

Turbine Shell Casing Air Piping

- Remove the U/H and L/H Turbine Shell Cooling Air Piping Ring Headers. Inspect prior to removal for accurate alignment to shell and for any needed replacement nozzles.
- Remove each turbine shell cooling air nozzle in the center of each turbine shell cooling air passage

Atomizing Air System Piping

- Remove the U/H atomizing air ring header
- Remove the atomizing air system stainless steel tubing between the atomizing air ring header and the fuel nozzles

Fuel Nozzles and Piping

- Remove the fuel nozzles in the combustion chamber covers
- Remove the igniters
- Remove the flame scanners
- Remove the U/H liquid fuel ring header
- Remove the stainless steel fuel oil lines Pressure test all liquid fuel valves and verify opening pressure
- Pressure Test and Flow Test fuel nozzles and water injection nozzles

False Start Drain Piping

- Remove the false start drain system piping under the turbine shell

Compressor Bleed Piping & Valves

- Remove the compressor bleed piping
- Remove the compressor bleed valves
- Remove the compressor bleed valve actuators

Combustion Chamber Covers

- Remove combustion chamber covers

Combustion Wrapper

- Remove #2 bearing oil vent piping
- Install jacks under the turbine casing
- Remove the combustion wrapper horizontal and vertical joint bolts
- Remove the U/H combustion wrapper

Transition Pieces

- Remove and properly align the TP's and hardware
- Remove the TP inner and outer packing in the 1st stage nozzle segments

Exhaust Duct

- Remove all exhaust duct bolting
- Remove the U/H exhaust duct

Turbine Shell

- Remove all turbine shell bolting
- Remove the U/H turbine shell

First Stage Nozzle

- Remove the U/H 1st stage nozzle

Exhaust Duct Bulkhead Panels

- Remove flex seals
- Remove the turbine end (forward) exhaust duct bulkhead panel
- Remove the generator end (aft) exhaust duct bulkhead panel

Compressor Discharge Casing (CDC)

- Remove all CDC bolting
- Remove the U/H compressor discharge casing

AFT Compressor Casing

- Remove all AFT compressor casing bolting
- Remove the U/H AFT compressor casing

FWD Compressor Casing

- Remove all FWD compressor casing bolting
- Remove the U/H FWD compressor casing

Air inlet Casing

- Remove all air inlet casing bolting
- Remove U/H air inlet casing

Inner Barrel

- Remove U/H Inner Barrel

Support Ring

- Remove the U/H 1st stage nozzle support ring

Exhaust Hood Frame

- Remove U/H exhaust hood frame

Exhaust Diffuser

- Remove the cooling air duct between the exhaust diffuser and the load compartment exhaust duct
- Remove the U/H of the exhaust diffuser

Load Coupling Shaft

- Remove load coupling shaft from turbine shaft
- Verify coupling bolt stretch readings following reassembly

Upper Half Turbine Shell Components

- Remove 2nd & 3rd stage wheelspace T/C guide tubes
- Remove 2nd stage nozzle segments
- Remove 3rd stage nozzle segments

Lube Oil System

- Clean main lube oil reservoir
- Clean #2 and #3 bearing lube oil reservoirs
- Refill the main lube oil reservoir

Upper Half Bearings

- Remove U/H bearing housings
- Remove U/H bearing housing oil/air seals
- Remove bearing vibration probes
- Remove U/H bearings

Lower Half Bearing Housings

- Pump oil out of lube oil reservoir
- Remove bearing T/C's
- Remove bearings
- Remove bearing seals

Lower Half Turbine Section

- Remove lower half 1st stage nozzle
- Remove 2nd & 3rd stage wheelspace T/C guide tubes
- Remove 2nd stage nozzle segments
- Remove 3rd stage nozzle segments

Generator (Rotor Not removed)

- Remove brush rigging cooling air line
- Remove brushes
- Remove brush rigging power cables

- Remove collector end brush rigging
- Remove #4 & #5 oil deflectors and measure clearance

Prior to taking the oil system out of service, the compressor rotating and stationary blades need to be inspected and NDE'd.

Generator Testing

All generator testing shall be performed with the rotor in place

Generator Test

- Generator All generator testing shall be performed with the rotor in place
- Remove brush rigging cooling air line
- Remove brushes
- Remove brush rigging power cables
- Remove collector end brush rigging
- Collector rings: Inspect collector rings for surface issues and address, clean-wipe down-blow out rings and cooling passages and keep covered with fishpaper or LKQ to prevent excessive oxidation during down time.
- Miniature air gap inspection or robotic inspection and borescope that covers visual of the retaining ring, field wedges, forging, stator bars, wedges, core laminations) Stator wedge tightness/map, ELCID “electromagnetic core imperfection detection” and stator clearance. Retaining ring inspection using outside surface eddy current and inner surface ultrasonic..
- Open top half of bearings 4 and 5 for visual inspection. If no signs of significant Babbitt migration and Babbitt to base metal interfaces look good, don’t roll out the bottom halves.
- Remove #4 & #5 oil deflectors and measure clearance
- Stator Test
- Winding copper resistance of each phase
- Ten-minute DC megger and polarization index of each phase
- D-C leakage test in steps up to 2EDC (or one step less, as you do not want to exceed running voltage equivalent)
- Resistance check of all RTDs
- One minute megger of RTDs
- Field Test
- Field winding copper resistance
- Field winding AC impedance test
- Ten-minute DC megger and polarization index of field winding

Scope of Work for Assembly

Generator

- Reinstall #4 & #5 oil deflectors and set clearance
- Reinstall collector end brush rigging
- Reinstall brush rigging power cables
- Reinstall brushes
- Reinstall brush rigging cooling air line
- Clean drive coupling face
- Clean drive coupling bolt holes

Hold/Verify Points

- Verify oil deflector (#4 & #5 bearings) clearance readings
- Inspect brush rigging following reassembly
- Verify positive brush contact with collector rings

Lower Half Turbine Section

- Install 3rd stage nozzle segments
- Install 2nd stage nozzle segments
- Install 2nd & 3rd stage wheelspace T/C guide tubes and verify wheelspace T/C's will insert properly
- Install lower half 1st stage nozzle

Hold/Verify Points

- Verify proper installation of 2nd & 3rd stage nozzle segments
- Verify proper installation of lower half 1st stage nozzle
- Verify proper installation of lower half wheelspace T/C guide tubes
- Verify cleanliness prior to turbine rotor installation

Lower Half Bearing Housings

- Pump oil out of lube oil reservoir
- Remove old bearings T/C wire
- Install new bearing T/C's
- Install bearings
- Install new bearing T/C's in bearings

- Verify proper operation of new bearing T/C's
- Install bearing seals

Hold/Verify Points

- Verify proper installation of bearing T/C's
- Verify proper installation of bearing vibration probes
- Verify proper installation of lower half bearing air and oil seals
- Verify cleanliness prior to bearing installation
- Verify reassembly bolt torquing assembly

Upper Half Bearings

- Record twist and tilt readings on L/H bearings, where needed
- Adjust L/H bearing to achieve acceptable twist and tilt readings, where needed
- Install U/H of bearings
- Install bearing vibration probes
- Install U/H bearing housing oil/air seals
- Install U/H bearing housings

Hold/Verify Points

- Verify bearing twist and tilt readings
- Verify cleanliness and lubrication prior to reassembly
- Recheck bearing T/C's for proper readings
- Verify correct vibration detector gaps on shaft areas
- Verify reassembly bolt torque

Lube Oil System

- Reclean main lube oil reservoir
- Reclean bearing lube oil reservoirs
- Refill the main lube oil reservoir

Hold/Verify Point

- Verify cleanliness of main lube oil reservoir and bearing drain oil reservoir prior to the final lube oil refill

Upper Half Turbine Shell Components

- Install 3rd stage nozzle segments
- Install 2nd stage nozzle segments
- Install 2nd & 3rd stage wheelspace T/L guide tubes and verify wheelspace T/C's will insert properly

Hold/Verify Points

- Verify proper installation of 2nd and 3rd stage nozzle segments
- Verify proper installation of upper half wheelspace T/C guide tubes
- Verify cleanliness prior to installation of U/H turbine shell

Load Coupling Shaft

- Clean coupling rim and face on both ends
- Clean coupling bolt holes on both ends
- Clean/remove loose material from interior of load coupling shaft
- Connect load coupling shaft to turbine shaft
- Stretch coupling bolts to ½ desired length
- Conduct a swing check on the generator end of the load coupling shaft
- Cross stretch the load coupling shaft bolts to produce an acceptable load coupling shaft swing check

Hold/Verify Points

- Verify cleanliness of load coupling shaft interior
- Verify no high spots or burrs on contact surfaces and cleanliness prior to installation
- Verify coupling swing check readings following assembly to turbine rotor
- Verify coupling bolt stretch readings following reassembly

Exhaust Diffuser

- Install the U/H of the exhaust diffuser
- Install the cooling air duct between the exhaust diffuser and the load compartment exhaust duct

Hold/Verify Point

- Verify horizontal/vertical joint surface cleanliness prior to installation

Exhaust Hood Frame

- Install U/H exhaust hood frame

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation
- Verify horizontal/vertical joint bolt torquing

Support Ring

- Install the U/H 1st stage nozzle support ring

Hold/Verify Point

- Verify horizontal joint surface cleanliness prior to installation

Inner Barrel

- Install U/H Inner Barrel

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation
- Verify no foreign objects in U/H inner barrel area prior to installation
- Verify horizontal/vertical joint bolt torquing

Compressor Discharge Casing (CDC)

- Install the U/H compressor discharge casing

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation
- Verify no foreign objects in U/H and L/H compressor air path prior to installation
- Verify horizontal/vertical joint bolt torquing

AFT Compressor Casing

- Install the U/H AFT compressor casing

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation

- Verify no foreign objects in U/H and L/H compressor air path prior to installation
Verify horizontal/vertical joint bolt torqing

FWD Compressor Casing

- Install the U/H FWD compressor casing

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation
- Verify no foreign objects in U/H and L/H compressor air path prior to installation
Verify horizontal/vertical joint bolt torqing

Air Inlet Casing

- Install the U/H air inlet casing

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to installation
- Verify no foreign objects in U/H and L/H compressor air path prior to installation
- Verify horizontal/vertical joint bolt torqing

Exhaust Duct Bulkhead Panels

- Install the generator end (aft) exhaust duct bulkhead panel
- Install the turbine end (forward) exhaust duct bulkhead panel
- Install flex seals

Hold/Verify Point

- Verify proper installation of exhaust flex seals

First Stage Nozzle

- Install the U/H 1st stage nozzle
- Align the 1st stage nozzle to the 1st stage buckets

Hold/Verify Points

- Verify horizontal joint cleanliness prior to assembly
- Verify horizontal joint bolt torque

- Verify proper alignment of 1st stage nozzle to 1st stage buckets

Turbine Shell

- Install the U/H turbine shell

Hold/Verify Points

- Verify horizontal/vertical joint surface cleanliness prior to reassembly
- Verify horizontal/vertical joint bolt torquing

Exhaust Duct

- Install the U/H exhaust duct

Hold/Verify Points

- Verify proper installation of new exhaust duct horizontal/vertical joint gaskets
- Verify tightening of all exhaust duct bolting

Transition Pieces

- Install the new TP inner and outer packing in the 1st stage nozzle segments
- Install and properly align the TP's using new hardware

Hold/Verify Point

- Verify TP alignment data readings

Combustion Wrapper

- Install the U/H combustion wrapper
- Follow the initial tightening of all horizontal and vertical joint combustion wrapper bolts, remove the jacks under the turbine casings
- Complete final torques of the combustion wrapper horizontal and vertical joint bolts
- Install #2 bearing oil vent piping

Hold/Verify Points

- Verify cleanliness of horizontal/vertical joint surfaces prior to installation
- Verify horizontal/vertical joint bolt torquing
- Verify proper installation of the No. 2 bearing oil vent line

- Verify no foreign objects are in the bottom of the combustion wrapper prior to the combustion chamber installation

Combustion Chambers (Cans)

- Install the combustion chambers using new gaskets and hardware. Ensure the seal areas are cleaned and able to provide a positive sealing surface.
- Reconnect the crossfire tube piping between the combustion chambers with new gaskets

Hold/Verify Points

- Verify cleanliness of the vertical joint surfaces prior to installation
- Verify cleanliness of the crossfire tube flange surfaces prior to installation
- Verify tightness of combustion chamber and crossfire tube flange fasteners

Combustion Liners

- Install combustion liners
- Install crossfire tubes and retainers

Hold/Verify Points

- Verify no foreign material is in the gas path prior to combustion liner installation
- Verify proper orientation and engagement of the combustion liner in the TP and combustion chamber

Combustion Chamber Covers

Install combustion chamber covers using new gaskets

Hold/Verify Points

- Verify no foreign material is in the air path prior to the combustion chamber cover installation
- Verify the cleanliness of the combustion chamber cover vertical joint surfaces prior to installation
- Verify vertical joint bolt torquing

Compressor Bleed Piping & Valves

- Install the compressor bleed piping using new gaskets

- Install the compressor bleed valves using new gaskets
- Install the compressor bleed valve actuators

Hold/Verify Points

- Verify flange surface cleanliness prior to reassembly
- Verify no foreign material is in the piping prior to reassembly
- Verify flange bolt tightening
- Verify proper operation of bleed valves following installation

False Start Drain Piping

- Install the false start drain system piping under the turbine shell

Hold/Verify Points

- Verify no foreign material is in the piping prior to reassembly
- Verify all flange and pipe union sealing surfaces are clean prior to reassembly

Fuel Nozzles and Piping

- Install the fuel nozzles in the combustion chamber covers
- Install the igniters
- Install the flame scanners
- Install the U/H liquid fuel ring header
- Install the stainless steel fuel oil lines

Hold/Verify Points

- Verify no foreign material is in the fuel piping prior to reassembly
- Verify no foreign material is in the combustion liner/TP prior to fuel nozzle installation
- Verify fuel nozzle bolt torquing
- Verify proper assembly and fitting tightness of the liquid fuel lines during reassembly

Atomizing Air System Piping

- Install the U/H atomizing air ring header
- Install the atomizing air system stainless steel tubing between the atomizing air ring header and the fuel nozzles

Hold/Verify Points

- Verify no foreign material is in the atomizing air ring header or flex lines prior to reassembly
- Verify proper piping and fitting assembly and tightness

Turbine Shell Casing Air Piping

- Install the U/H and L/H Turbine Shell Cooling Air Piping Ring Headers
- Position each turbine shell cooling air nozzle in the center of each turbine shell cooling air passage

Hold/Verify Points

- Verify no foreign material is in the piping prior to reassembly
- Verify cleanliness of the piping flange and pipe union sealing surfaces prior to reassembly
- Verify proper flange bolt and pipe union tightness following reassembly

Turbine/Generator Bearing Oil Vent Piping

- Install bearing oil vent piping

Hold/Verify Points

- Verify no foreign material is in the piping prior to reassembly
- Verify cleanliness of the piping flange surfaces prior to reassembly
- Verify proper flange bolt tightness following reassembly

Engine Compartment

- Install the engine compartment walls
- Install the engine compartment wall to intake expansion joint
- Install the engine compartment wall to exhaust expansion joint
- Install the engine compartment roof

Hold/Verify Points

- Verify proper sealing of the expansion joints between the engine compartment and the exhaust bulkheads and the engine compartment and the intake structure
- Verify proper opening and closing of the engine compartment doors
- Verify proper operation of the engine compartment vent fan
- Verify proper operation of the engine compartment heaters
- Verify proper operation of the engine compartment lights

Instrumentation/Electrical

- Igniters
- Flame scanners
- Wheelspace thermocouples
- Exhaust thermocouples
- Engine compartment vent fan
- Engine compartment lights
- No 1 bearing thermocouples
- No 1 bearing vibration detectors
- No 2 bearing thermocouples
- No 2 Bearing vibration detectors
- No 3 bearing thermocouples
- No 3 bearing vibration detectors
- 5th stage compressor bleed valve
- 11th stage compressor bleed valve
- Install new engine compartment heater

Hold/Verify Points

- Verify proper operation of the igniters prior to installation
- Verify cleanliness of the igniter flange face surfaces prior to installation
- Verify igniter flange bolt tightness following installation
- Verify proper operation of the flame scanners prior to installation
- Verify cleanliness of the flame scanner flange face surfaces prior to installation
- Verify flame scanner flange bolt tightness following installation
- Verify wheelspace thermocouple operation following installation
- Verify exhaust thermocouple operation following installation

Additional Work Prior to Assembly

The following additional work will be quoted as a separate lines on page 2 of the bid form. These repairs are outside of the scope of a normal major inspection:

Inspect, clean, and repair closed cooling radiator, oil cooler

- During normal operation evidence of a coolant leak was observed, clean, test and repair.
- The inspection and cleaning of oil cooler exchanger

Alignment

- Verify that the unit is proper aligned. Alignment data needs to be taken at each coupling and compared to GE recommended data.
- If a move needs to be made it shall be done between sunset and sunrise.

Inspect/repair bearings

- The last outage on this unit was over to ten years ago. JEA would like to have **ALL** bearings inspected and repaired, including the thrust bearing. All the proper preparations need to be made to access these bearings, the critical path is to get the rotor out and these bearing inspections can be conducted during the same time line as shop work. All bearing repair will be handled as separate work.

Start-Up Support

- The Contractor (Bidder) is required to provide 3 mechanical type personnel (could look like; 1 Supv. and 2 CT mechanical personnel) and their Technical Assistant (TA) for the duration of five (5) business working days after the unit is turned over to operations for start-up.
- **Successful Start-up and Operational Acceptance is defined as: successful turning gear in operation, all fuel/air piping in place, instrumentation and controls operational and a full load four hour run.**
- Additionally, Bidders are requested to provide a T&M Rate sheet with their bid. If additional time is required, then JEA will go off the supplied T&M rate sheet provided.
- **The following additional information is provided for clarification and to support Bidders completing their bids.**
- The Bidder is not expected to pay the JEA Project Supervisor's wages.
- All personnel working on site need to have the OSHA-10 training and Site specific training as required by the JEA safety program.
- A clean up person will need to be provided in accordance with the IFB Technical Specification requirements.
- JEA will provide I&C support during start up.

Parts List

The Bidder shall provide pricing for following items are listed on the Bid form page 2. These items will not be included in the evaluation of the bid for award. JEA may elect to purchase the items listed below from any Bidder, that submits a bid.

<u>Item Description</u>	<u>Quantity</u>
Compressor enclosure to Turbine enclosure fabric expansion joint	1
Turbine enclosure to Exhaust expansion joint fabric expansion joint	1