

		
GUADALUPE POWER PARTNERS, LP	Section	MAINTENANCE
	Subject	GT1 CI WORK SCOPE

Outage; Combustion Inspection on Gas Turbine #1 serial number 297365

Start Date; March 15, 2009

Completion Date; March 21, 2009

Test Fire and Tune Date; March 20, 2009

Work Scope Summary

- Combustion Inspection
 - Replace Combustion Transition Pieces
 - Replace Combustion Liners
 - Replace Combustion Flow Sleeves
 - Replace Combustion Cap Assemblies
 - Replace Combustion Fuel Nozzle Assemblies
 - Replace Aft Combustion Casings
 - Install engineering upgraded Cross Fire Tube Metal Bellows
 - Install replacement forward mount support blocks to correct transition piece clearance
- Other
 - Insulation repair to the Exhaust Flex Seal Area by Basic Industries of South Texas

1. Mobilization

1.1. Mobilize on Job Sight

- 1.1.1. Provide TIE safety personnel a list of employees and be present to receive site specific safety orientation
- 1.1.2. Attend a pre-outage introduction meeting following safety orientation
- 1.1.3. Locate tool storage units in areas pre-designated as to not interfere with the inspection(tool storage units shall have the Standard Tools and any special tooling required for the disassembly of the turbine and or parts removal/installation, See GEK 103703 Standard Practices)
- 1.1.4. Set up office, establish communications, NOTE* No phone line will be supplied outside of the control room
- 1.1.5. Provide direction for locating sanitary facilities
- 1.1.6. Establish working crews with appropriate supervision
- 1.1.7. Organize the work area by properly locating equipment. Including rental units

2. LOTO

2.1. TIE Responsibilities

- 2.1.1. Post LOTO on the CO2 system for the prescribed turbine compartments per TIL 1496-1
- 2.1.2. Post LOTO on the Fuel Gas system (GE requires a blind be installed in the supply line) (Double block and bleed verification is acceptable from Sulzer)

		
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- 2.1.3. Post LOTO on the HRSG Auxiliary Burner gas supply line
- 2.1.4. Post LOTO on the Turning Gear(motor breaker and the manual hand wheel)
 - 2.1.4.1. An O&M lock should be used for the hand wheel
- 2.1.5. Post LOTO on the LCI(starting system)
- 2.2. Contractor Supervisor Responsibilities
 - 2.2.1. Before proceeding with the inspection confirm with the Maintenance and Operations contact personnel that the CO2 system is tagged-out, any associated electrical power tagged-out, the gas supply is blinded off and or tagged-out, and the gas turbine LCI is tagged-out. The turning gear will have an O&M LOTO. Confirm all other required systems are tagged out.
 - 2.2.2. Post personnel locks accordingly

3. Disassembly

- 3.1. Disconnect all associated piping, tubing, and cable trays to allow the removal of the combustion hardware.
- 3.2. Direct the installation of any necessary scaffolding. TIE GPP to provide qualified scaffold erection service provider.
- 3.3. Remove gas fuel lines per TIL 1585. Mark all piping accordingly and cover pipe openings to prevent entry of debris in accordance with the site FME program. (Immediately notify plant contact of any damaged fuel lines.)
- 3.4. Remove cooling and sealing air lines necessary to facilitate the inspection per TIL 1585. Mark all piping accordingly and cover pipe openings, or blind if necessary, to prevent entry of debris in accordance with the site FME program. (Immediately notify plant contact of any damaged fuel lines.)
- 3.5. Unbolt and remove combustion casing man way covers on the Upper and Lower Combustion Casing. (Immediately notify plant contact of any damaged fasteners.)
- 3.6. Remove FWD casings with end covers/fuel nozzle assemblies installed. Mark all piping accordingly and cover pipe openings to prevent entry of debris in accordance with the site FME program.
- 3.7. Remove the end cover/fuel nozzle assemblies from the fwd combustion casing. This process shall be closely monitored by the CSP supervisor to ensure the fuel nozzles are not damaged during removal.
- 3.8. Remove crossfire tube retainers, combustion liners, crossfire tubes, and flow sleeves. Mark all components relative to locations with approved marker.
- 3.9. Remove AFT combustion casings. Mark relative to location.
- 3.10. Record all transition piece picture frame clearance to stage 1 nozzle. Notify TIE GPP management and provide clearance readings.
- 3.11. Remove transition pieces. Mark relative to location. Maintain all floating seals with each transition piece as well as the side seals and side seal retainers.
- 3.12. Remove FWD transition supports or Bullhorns. Mark relative to location. TIE GPP to provide new or refurbished supports for reassembly.

		
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- 3.13. Remove forward mount support blocks if necessary to correct transition piece clearances.
- 3.14. Contractor to provide accurate serial number tracking of all turbine hardware. (TIE Stores Clerk to receive serial number identification immediately.)

4. Inspection

- 4.1. Note and report any unusual conditions of combustion hardware, i.e. burned liners, hot spots, rubs, oxidation, TBC spalling, ect. CSP and TIE Stores Clerk will package hardware in TIE provided crates.
- 4.2. Inspect the 1st stage nozzle. Document findings such as electronic photos of cracks. Report findings immediately to the plant Maintenance Manager.
- 4.3. The CSP shall inspect and clean the quaternary fuel circuit on the fwd combustion case. This circuit may contain trapped debris and gas hydrocarbon build-up that can have a negative effect on flow.
- 4.4. Assist TIE I&E department with a #2 bearing area inspection
 - 4.4.1. The inspection consists of removing the access door and providing 1 millwright for general assistance. This inspection is intended to check the case for any obvious distortion or abnormalities and to check the instrumentation with the compartment.
- 4.5. Inspect exhaust struts for cracking. Report findings to plant contact. TIE GPP will provide qualified welding contractors to perform any necessary repairs.
 - 4.5.1. Level 2 FME
- 4.6. Visually inspect inlet guide vanes and bushings (hand clean vanes, die penetrate test for cracks, measure bushing clearances and backlash of each vane, measure angle of each vane.)(Reference GEK 103703 for clearances)
 - 4.6.1. Level 2 FME
- 4.7. Visually inspect the inlet expansion joint and replace if necessary. TIE GPP will provide a spare expansion joint with pre punched holes if replacement is required.
- 4.8. Visually inspect all fuel gas, water, and hydraulic piping before reinstalling per TIL 1585
- 4.9. The Contract Supervisor is required to record serial numbers of all components removed and all components installed.
- 4.10. The Contract Supervisor is required to take electronic photos and submit to TIE in a report package.
 - 4.10.1. The TIE Stores Clerk will receive and review all serial number identification during removal and reassembly.
- 4.11. Inspect the inlet duct per TIL 1518-2
 - 4.11.1. TIE will provide a manlift capable of accessing the duct downstream of the Inlet Bleed Piping. Any deficiencies shall be reported immediately to the plant contact.
 - 4.11.2. Level 2 FME

5. Parts Preparation for shipping Note* To be completed as soon as the components are removed and field inspected

		
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- 5.1. The CSP will stage all components locally and organized for field inspection. That is all like components arranged in an orderly fashion in the same position for the ease of reviewing.
- 5.2. TIE personnel will package the components for shipping. Assistance may be required by the contractor.

6. Reassembly

- 6.1. Install refurbished end cover/fuel nozzle assemblies and refurbished caps in the fwd combustion casings. This process shall be closely monitored by the CSP supervisor to ensure the fuel nozzles are not damaged during reassembly.
- 6.2. Install new transition piece forward support mounting blocks as determined to correct the transition clearance.
- 6.3. Install refurbished transition piece forward supports, or Bullhorns.
- 6.4. Install refurbished transition pieces
- 6.5. Measure and record all fourteen transition piece picture frame setback clearance to stage 1 nozzle. Record both the disassembly and reassembly data on one form for comparison. This data must be supplied to the plant Maintenance Manager prior to assembly the other hardware.
- 6.6. Install AFT combustion casings
- 6.7. Install new metal bellows outer cross fire tubes
- 6.8. Install crossfire tubes and retainers. Ensure correct rotation of cross fire tubes before installing the retainers.
- 6.9. Install combustion liners, and flow sleeves.
 - 6.9.1. The and CSP Supervisor shall immediately verify the correct location of the liners and flow sleeves to ensure the alignment of the penetrations for the igniters and flame detectors.
- 6.10. Install combustion casing man way covers on the Upper and Lower Combustion Casing.
- 6.11. Install CDM support probes prior to installing the fwd casings.
- 6.12. Install fwd combustion casings which contain the end cover/fuel nozzle assemblies and cap assemblies.
- 6.13. Install cooling and sealing air piping
- 6.14. Install fuel gas lines per TIL 1585
 - 6.14.1. Ensure proper torque of fasteners
 - 6.14.2. Ensure correct gasket is installed per TIL 1213-1r1
- 6.15. Ensure the quaternary orifice is installed in the fwd case prior to installing the mating fuel supply line.
- 6.16. Install all associated piping, tubing, and cable trays (TIE will assist)
- 6.17. The CSP Supervisor shall review the deck to ensure that all hand guards, rails, and protective equipment has been restored.
- 6.18. Direct the removal of any scaffolding
- 6.19. Close inlet plenum access panel
- 6.20.** Close exhaust plenum access panel

7. Completion

		
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- 7.1. Contractor shall maintain all damaged or replaced turbine hardware until job completion. At which point TIE will review the items with the contractor. The items need to be labeled accordingly with part # & or description, as well as location from which removed. (bullhorns, cloth seals, ect.,)
- 7.2. Remove applicable LOTO and prepare the unit for operation. The turbine must be complete and ready for start-up tuning no later than Monday evening 7PM November 10, 2008
- 7.3. Contractor will assist TIE Operators and Maintenance personnel with any associated items with releasing the LOTO
- 7.4. Restore job site to original condition(thorough 100% clean-up)
- 7.5. Remove tool storage unit from job site
- 7.6. Furnish all available photos and inspection forms on appropriate media storage disk to the plant Maintenance Manager
- 7.7. Furnish complete inspection report
 - 7.7.1. Report to be received within 30 days of outage completion date
 - 7.7.2. Report copies supplied in electronic version and hard copy version
 - 7.7.3. Complete opening and closing clearance reports to be included
 - 7.7.4. Component serial numbers are to be recorded in report
 - 7.7.5. Invoice payment will not be approved by TIE until the complete report package has been provided

8. Other Inspections

8.1.

9. GE TIL's to be Performed

- 9.1. TIL 1213-1R1 Spiral Wound Metal Gasket Upgrades
- 9.2. TIL 1397-1r1 DLN 2.6 Combustion FWD Casing Inspections
- 9.3. TIL 1460-2 Turbine Enclosure Crane Recommendations
- 9.4. TIL 1496-1 Ansul CO2 Selector Valve (LOTO)
- 9.5. TIL 1509-1 F-Class Front End R0/R1 Compressor Inspections
- 9.6. TIL 1518-2 Maintenance Inspection of Air Inlet System
- 9.7. TIL 1547-2 Gas Turbine Flex Hose Recommendations
- 9.8. TIL 1585 Proper use and care of flexible metal hoses

		
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10. Contractor Responsibilities

- 10.1. Follow the site FME, or Foreign Materials Exclusion program
- 10.2. Provide field service support to safely and efficiently perform the work scope as provided under tabs 1 thru 10.
- 10.3. Provide all necessary tooling to complete the work scope.
- 10.4. Provide a break room for the contractor crews.
- 10.5. Provide a current copy of insurance certificate
- 10.6. Provide a time sheet per 24 hour shift
- 10.7. Provide a daily progress report during the outage. The report shall cover the previous 24 hours, or previous two shifts.
- 10.8. Provide a detailed Field Service Inspection Report in electronic format no later than 30 days of job completion.

11. TIE-GPP Responsibilities

- 11.1. Provide specific on site safety training to all contract service providers. This training does not substitute for any contractor required safety training.
- 11.2. Provide turbine parts for reassembly as necessary to complete the work scope. Including all consumables such as fasteners, seals, gaskets, etc.
- 11.3. Provide crane service necessary to complete the work scope.
- 11.4. Provide all special lifting devises necessary to complete the work scope.
- 11.5. Provide rental equipment necessary to complete the work scope. Forklift, lighting, weld rigs, etc.
- 11.6. Provide scaffolding as necessary to safely complete the work scope.
- 11.7. Provide port-a-cans sufficient to support the contractor crews thru the duration of the outage.
- 11.8. Provide sanitary cleaning stations for contractor crews.
- 11.9. Provide electrical power as necessary to complete the work scope and to break/tool rooms.
- 11.10. Provide plant air to operate pneumatic tooling as necessary to complete the work scope.
- 11.11. Provide Olympus Borescope for Inspections
- 11.12. Provide FME access and direction.