

Plant/Unit	GH4	Event Start	5/2/2022 10:52:00 PM
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**EVENT**

Prepared By		Date	1/1/0001
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(F820), GH4, Forced Outage, Outage #3, Ghent 4 Division panel #3 Tube14 tube leaks were repaired at 16:50 hours on 5-2-2022. The unit was unable to be placed in service due to overheating of the #3 turbine bearing during initial roll up after tube leak repair.

**OPERATIONS EVALUATION**

Prepared By	1590;#Frontz, Steven	Date	6/7/2022
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GH4 #3 Turbine bearing Temperature spiked during initial roll up of the turbine after completion of the Division panel #3 tube 14 leak repair. SSIC was directed by the Production Supervisor to manually trip the Turbine, remove fire from the boiler and allow the turbine to coast down to turning gear in order to begin the cool down process for bearing inspection and possible repair. Plant Manager, Production Manager and Maintenance Manager were notified.

**MAINTENANCE EVALUATION**

Prepared By	328;#Rabe, Phil	Date	8/2/2022
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GH4 was removed from service on 4/30/22 to repair leaks in the boiler. The unit was brought off line at 1216 hours and the turbine began to coast down. Around 1239 hours the turbine speed was approximately 500 rpms and the #3 bearing metal temperature was around 130F. At this time the #3 bearing metal temperature began to rise. When the turbine speed dropped to around 250 rpms the temperature peaked around 255F and began to drop and then increased to around 265F shortly before the turbine went on turning gear. Comparison to a previous coastdown shows the turbine went on gear about 8 minutes faster than before. Following the boiler leak repairs it was decided to roll the turbine up while monitoring the temperatures on the #3 bearing. As the turbine rolled up, the #3 bearing temperatures were elevated over normal startups and at around 1000 rpms the decision was made to remove fires from the unit and prepare the turbine for inspection of the #3 bearing. Once the turbine was cool enough to allow inspection LOTO was performed. The #3 bearing was disassembled and revealed the top half had been rubbed and the lower half was wiped. It was noted that one of two oil supply lines attached to the top half of the bearing had a shim that partially obstructed the opening. (see attached PowerPoint) Scoring of the #3 journal was also evident. The #3 bearing was sent out to be repoured and arrangements were made to perform on-site machining of the journal. Inspection of the lube oil tank showed babbitt in the tank. It was decided to inspect all of the turbine bearings and the 4-1 and 4-2 BFPT trains and to drain and clean the Main Turbine Oil Reservoir. The additional inspections revealed minor scratching of the #6 bearing upper half. The #8 and #9 bearings showed minor damage and were sent off site for repairs as well. All other bearings were found to be in good condition. Due to contamination of the lube system an oil flush was performed. All work was completed and the unit was released to Operations on 5-17-22.

**RECOMMENDATIONS**

Prepared By	328;#Rabe, Phil	Date	8/2/2022
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The cause of the bearing wiping could not be definitively determined. The one thing found that would affect the oil flow to the bearing was the shim that partially obstructed the opening in the top half of the bearing. The turbine was last overhauled during the spring of 2020. Inspections should be performed prior to placing the top half of the bearings on the machine to ensure no obstructions are present. Inspections of the Main Turbine Oil Reservoir and the TDBFP front standard tanks revealed the gasket materials for the doors were in poor condition and were allowing dirt and debris to be pulled into the tanks. More attention to the condition of these gaskets should be given.

Note 1

Note 2

**COMBINED RESULTS**

Prepared By

Date

Work Order 1	8516833			Date Written	5/3/2022
Work Order 1	STATUS	Total Amount	Description		
8516833	COMP	\$152,210.00	(SERVICES-LC) U-4 TURBINE BEARING #3 INSPECTION / REPAIR		
Work Order 2	8518130			Date Written	5/4/2022
Work Order 2	STATUS	Total Amount	Description		
8518130	COMP	\$68,285.42	(DAY SHIFT) U-4 IMM SUPPORT TO PULL TURBINE BEARINGS AND SET UP FOR TURBINE OIL FLUSH		