ExxonMobil Baytown Frame 6B TIL 1576 EOL Inspection Results

Frame 6B User Group Meeting
June 25-28, 2012
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ExxonMobil Chemical

Baytown Cogen Vital Stats

- Located in Baytown, TX (about 25 miles east of Houston)
- Supplies power & steam to Baytown Refinery & Chemical Complex

- 3 PG-6541 Units
- Commissioned in 1989
- Base load, NG fuel, NOx steam injection
- EOL Inspection at 180k fired hours

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Lifetime Inspection Scope

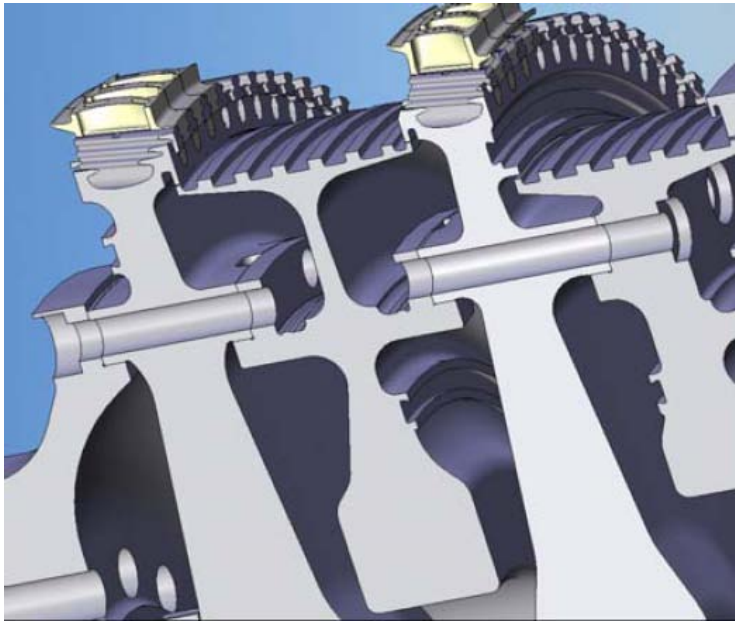
Scope

Complete rotor disassembly

NDE inspection of aft compressor and all turbine CrMoV steel wheels. Focus areas-

- ❑ Dovetail slots
- ❑ Rabbets
- ❑ Wheel bores
- ❑ Bolt holes

All indications found must be dispositioned by GE engineering – blended, repaired, use as-is, or replace component.



Courtesy EPRI

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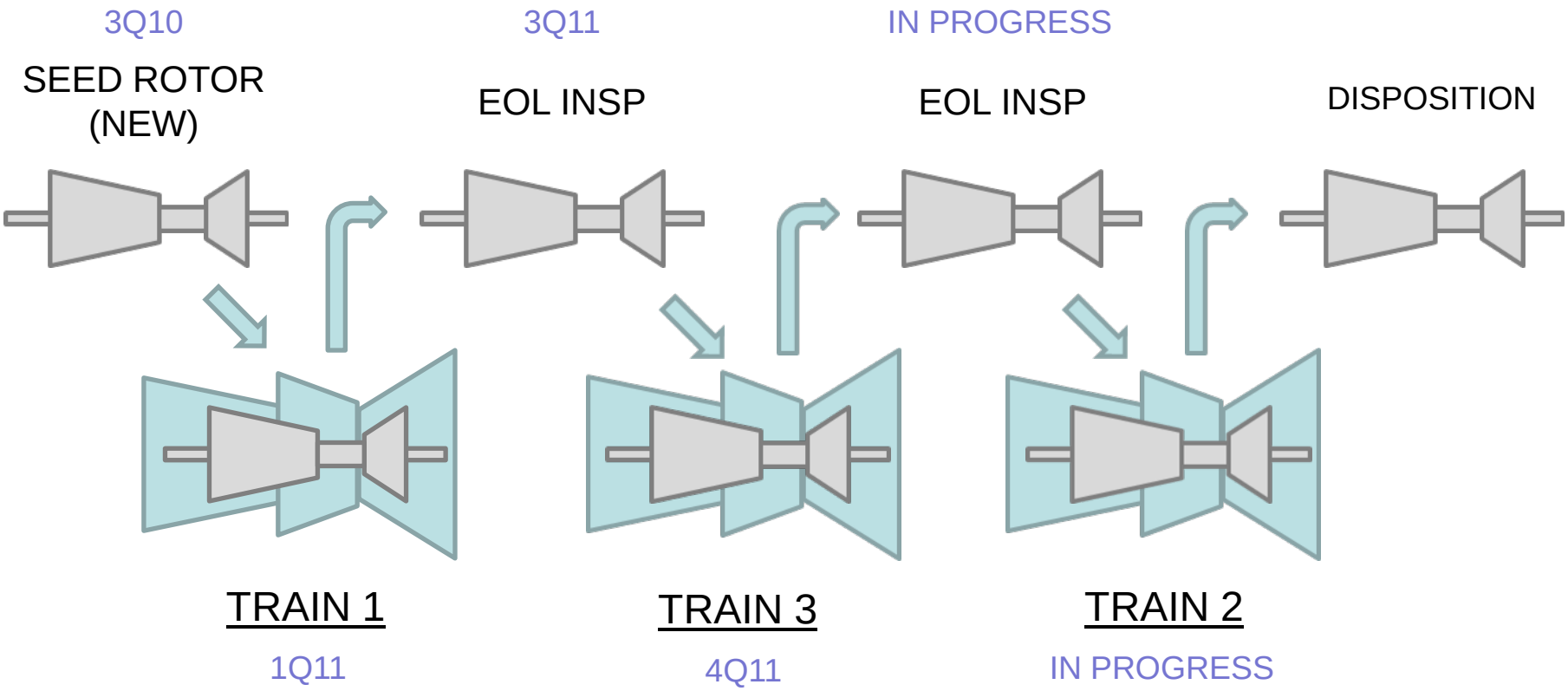
Baytown Cogen EOL Inspection Strategy



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TIL 1576 EOL Inspection Scope

- Service Rotor from Unit 295361 going into Unit 295362
- 180,200 EOH, 141 starts, 75 trips
- EOL Inspection performed at GE Houston Service Center
- Work scope focused on the aft compressor wheels (14-17), distance piece and turbine assembly.
- Typical timeframe for entire process is about 2-3 weeks for destack/clean-up, 2 weeks for EOL inspection, 3-4 weeks for reassembly if everything came in-spec with minimal machine work. For the entire process estimate about 8-9 weeks.

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Visual Inspection and Replications

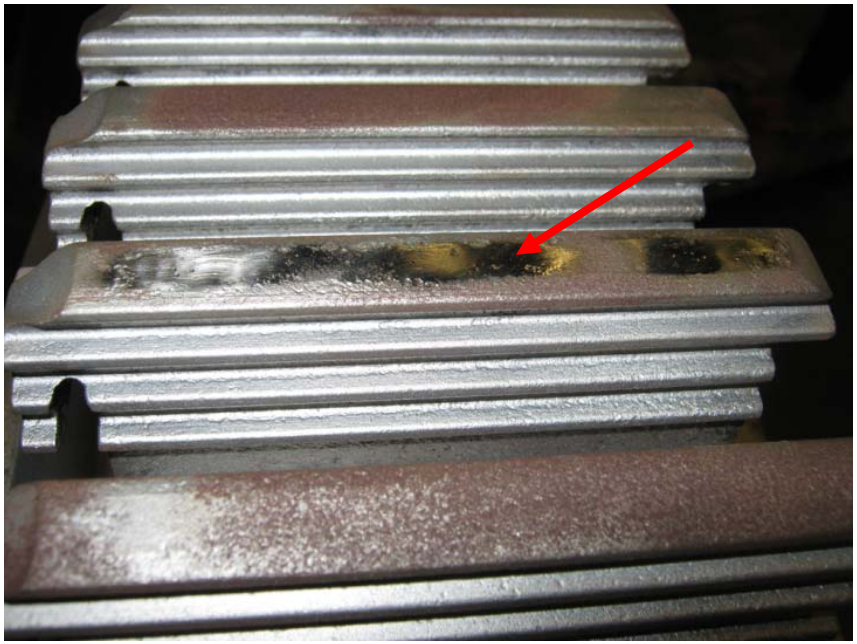
- Pitting in the bore, throughout cooling air flow surfaces on compressor 16th stage thru stage 2 turbine wheel
- Pitting generally noted on all wheels, nothing life limiting to the components; no micro-cracking or grain structure variations documented from any of the replicas
- Bore surfaces were reconditioned / honed to eliminate stress concentrations and bore fatigue damage

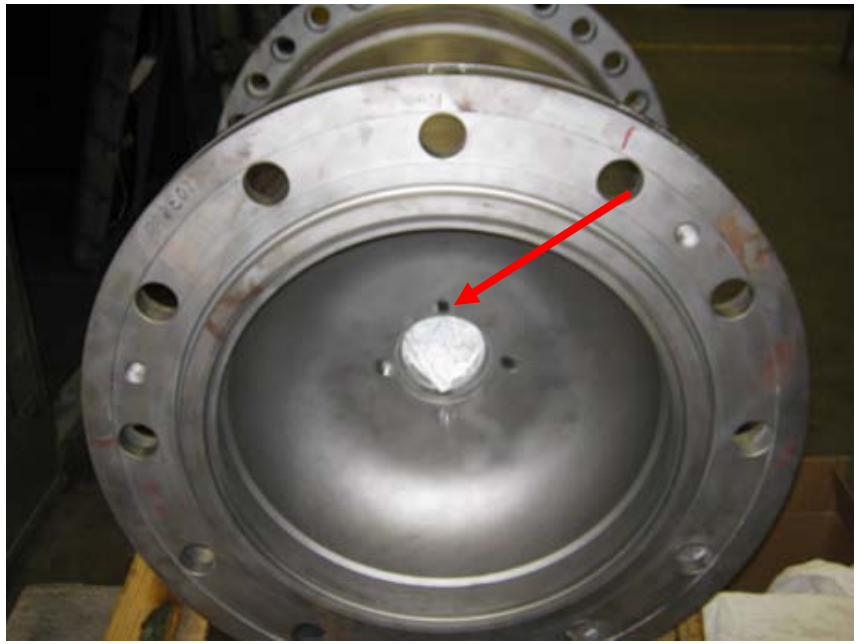
Magnetic particle – no findings

- Completed on the entirety of each component, with focus on bore, bolt hole, rabbets, dovetails

Hardness readings – all within GE's serviceable tolerance ranges, no concerns

- Taken on rim and hub regions
- Wide variations found, consistent with GE experience as hardness readings through the life of the component are required to understand true material degradation
- Reviewed against forging records, no values which would have an impact on the component life through the extended life



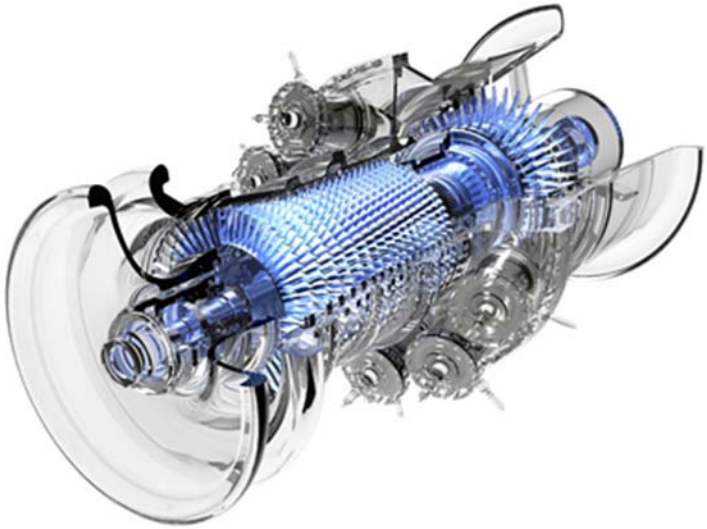


Ultrasonic readings – no life limiting findings

- Performed on bore surfaces of all components in scope.
- Some indications were found imbedded into the distance piece. The defects were most likely original imperfections in the original forgings. Fracture assessments determined no anticipated propagations to failure within 750 starts.

Conclusion

Inspections completed on the ExxonMobil rotor sections revealed no limiting indications and serve to verify the lack of life-limiting, accumulated damage within acceptable probability for additional continued operation for the specific rotor sections analyzed. Life is extended to 750 total starts and a total of 300,000 EOH.



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