

Induced Draft ACC Overview

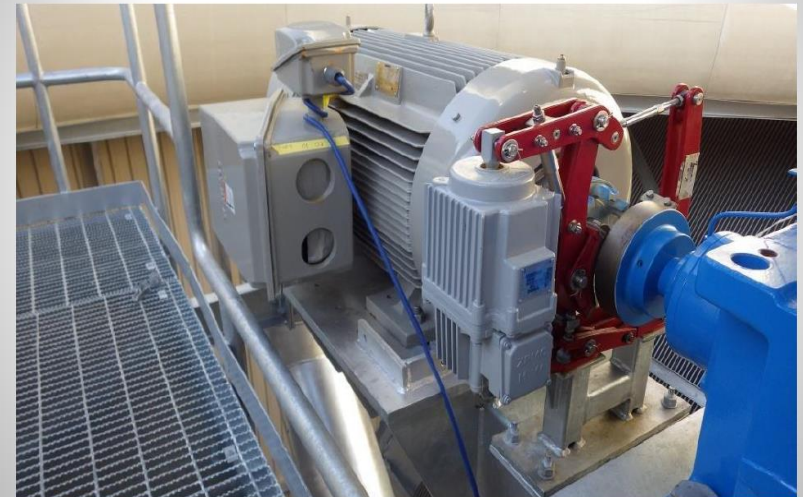
Induced Draft (W) design condensers have become more popular for new CCGT Plants. By arranging the heat exchangers in a "W" shape, the system maximizes heat transfer surface area, reduces steam velocity—which minimizes flow-accelerated corrosion—and creates better wind resistance

Construction Photo's





FAN BRAKE



STG Exhaust Duct







Maintenance Issues

- **Consistent Input Seal Failures – Upgraded from Factory Flender issued Nitrile Seals to FKM Seals for higher temperature resistant properties. Original Nitrile seals found brittle, indicating heat damage.**
- **Input Bearing Assembly Failure – Currently found through consistent monthly vibration analysis and biannual physical inspections of the gearboxes. Excessive run-out found upon coupling inspections indicate bearing assembly failure.**



Input Bearing Assembly Rebuild on B3NV-10 Gearboxes

FLENDER/IPE/MTI

MAINTENANCE TECHNOLOGIES INTERNATIONAL (MTI)

- MTI has done a field service report on 0CND-GEAR-0102 during there annual ACC vibration testing. Analytic results found potential bearing defects from high vibration frequencies on the inner and outer input bearings on the inboard side of the gearbox. MTI recommended that both input bearings be changed.

MTI Field Service Report



Maintenance Technologies International
233 Research Drive, Suite 7
Milford CT 06460
203-877-3217
www.mtillc.com

Vibration Detailed Analysis Report

ACC | ACC FANS
102 ACC FN ACC FAN 102

Serious

Fault Type: Antifriction bearing defect

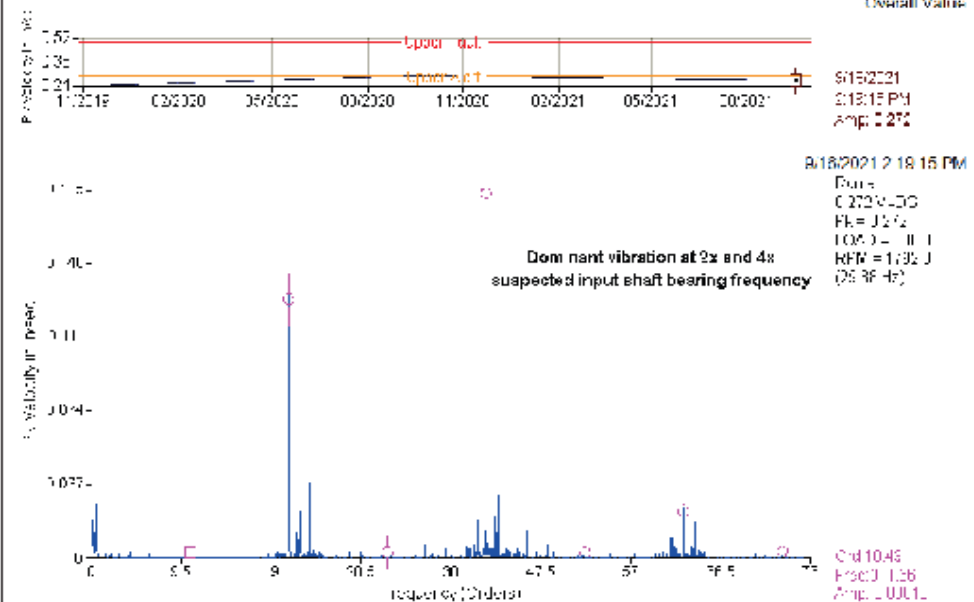
Survey Date: 16-Sep-21

Component: Air Handler (Fan)

Explanation: 9/16/21: Vibration analysis on this gearbox shows suspected inner and outer bearing defects on the gearbox input shaft bearings. Previous gear inspections have not shown any suspected issues. MTI recommends replacing the input shaft bearings and remonitoring.

Valley Energy Center Unit 1 / ACC / ACC FAN 102 / CA - ISO INPUT AXIAL

Overall Values



Bearing vibration dominant

ACC INBOARD BEARINGS

- The bevel set on the input bearing housings are a Tapered roller bearing design. The housing consist of two bearings that are mounted opposed to each other.





- Upon disassemble of the inboard housing it was noted that there is normal wear on the drive gear. The helical cut gear is annealed for hardening purposes and will naturally wear off when in normal operating service.

BEARING REMOVAL

- Remove the cover plate on the bearing housing.
- Remove the threaded keeper collar that holds the outer bearing in place. Apply heat to the inner race of the bearing for thermal expansion. Then apply force to the shaft in the downward motion slowly.
- Make sure there is a piece of plate with rubber or wood to catch the input shaft. If plate or wood is forgotten there is potential to damage the helical cut gear.



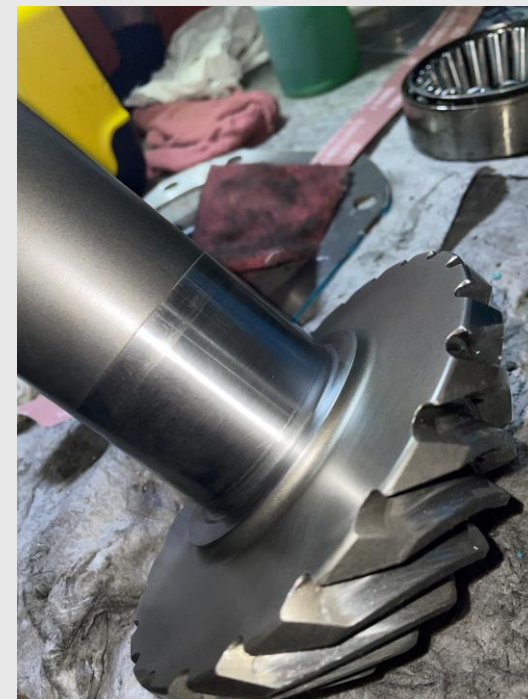
BEARING REMOVAL CONTINUED...

Once the outer bearing is removed the outer cup of the bearing can come off the cage of the rollers.

To remove the inner bearing cage. Use a punch and rotate around the cage of the bearing and punch in an even clocked manner. This will remove the cage of the bearing that holds the rollers in place, leaving the inner race of the bearing still on the shaft.

Use a collar press to remove the inner race of the bearing.





- Punch out the outer collar of the inner bearing.
- Clean the shaft with a light duty scotch bright.
- Clean the bearing housing with light duty scotch bright.
- Scrape additional grim out of the housing if needed.

New Bearing Assemblies

Heat both bearing assemblies to 240-260 degrees Fahrenheit. This allows the bearings to easily slip on to the shaft when assembling them. Before setting your bearing tolerance it is important to make sure the bearings are cooled down to ambient temperature.





Bearing Assemblies Continued

...

- The new bearing assemblies require a threaded collar that sets your bearing gap clearances. Using a Dial gauge with a magnetic arm. The bearing clearance tolerances are .04 - .06 mm for the input bearings. 0CND-GEAR-0102 was set to .05 mm with the new bearing assemblies. After setting the tolerance between the bearings, there is a metal tab that needs to be bent-in to keep the tolerance when the input bearings are in service.





Closing

- Carefully use gear marking compound to check your gear contact after remounting of the drive gear. 0CND-GEAR-0102 has been sealed using Loctite 5156. The housing mounting bolts are torqued to 155ft/lbs in a proper torque sequencing pattern. The input seal has also been replaced because of the convenience of the location of the housing.