Work Request Follow-Up Report
Vibration Analysis

Area 700 Power Generation
G745A Liquid Ring Vac Pump

Pump DE bearing Damage
(Corrosion)

June 2015

Report compiled by TV1 RI Team
The parameter profile above is a graphical representation of the vibration alarms which have been broken across the machine. Note the high levels on the pump DE bearing, recorded on the 27th May 2015, the first set of data collected.

Analysis of the standard spectrum above taken from the pump DE bearing showed a set of non-synchronous harmonics at 9.11 orders of turning speed. This matched the outer race defect frequency for the SKF 21313E pump bearing, other harmonics were also present related to the Inner race and roller defect frequencies. This indicated the bearing had multiple defect sites.
Analysis of DE Vacuum Pump Bearing – SKF 21313 E

**Appearance**
Greyish black streaks and marking on all rolling element surfaces, heavy pitting and cracking

**Cause**
Presence of water / moisture in the bearing over a long period of time. Most likely due to poor pump storage before operation, lack of adequate seal arrangement at the DE is also a contributing factor

**Action.**
Store equipment in suitable a location before fitment and rotate periodically. Consider modification of DE pump brg sealing arrangement.
The vibration trend above (Waveform PK-PK G’s) shows a clear drop in G levels after the pump bearings were replaced in early June.

**Estimated Avoided Cost Saving**

**Action Taken**
Actual work done to repair the pump.

- **Materials:** New compressor bearings / parts **£300**
- **Labour:** To remove pump replace brgs Refit 3 days x 2men £39/hr **£1872**
- **Production Losses:** None, standby available

**Total Cost:** **£2172**

**No Action Taken**
Scenario: Secondary damage to the pump caused by the failure of the DE pump brg

- **35% of ERV (Estimated Replacement Value)** New Unit £60,000 = **£21,000**
- **Labour:** To remove pump replace brgs Refit 4 days x 2men £39/hr **£2496**
- **Production Losses:** None, standby available

**Total Cost:** **£23,496**

**Estimated Avoided Cost:** **£21,324**

Note: Pump G745B also had the same bearing problem as the A unit. The pump bearings were replaced on this unit giving a combined estimated avoided cost saving of £42,648

Stuart Walker (RMS)

24th June 2015