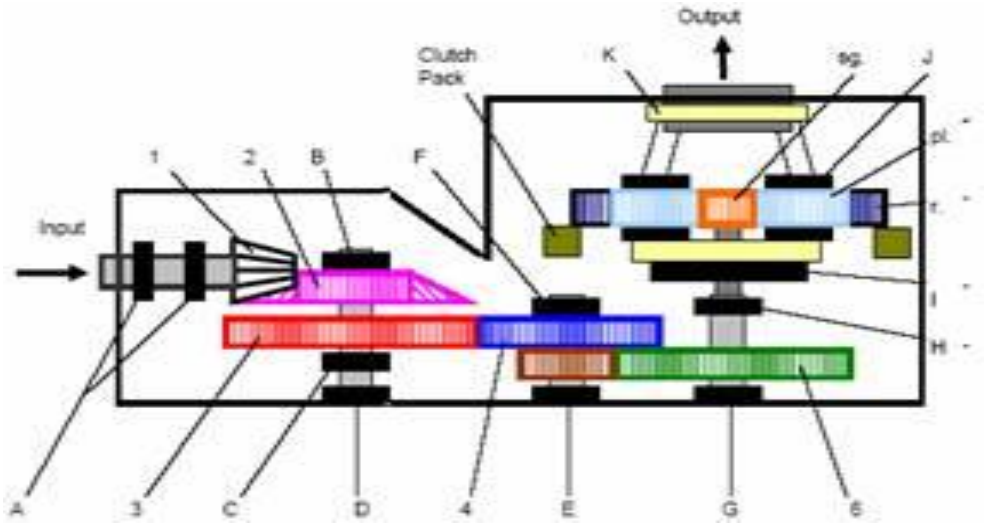
Finding the Correct Bearing



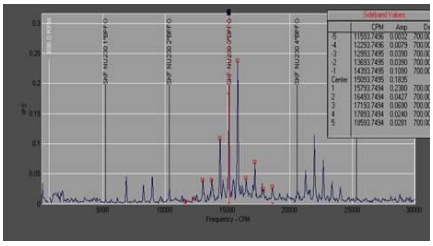
How can you tell which bearing is bad?

As one can see from the simplified drawing above, there is a lot going on inside this gear box. There are 15 or so bearings, 11 gears, 8 rotating shafts, clutches, gear meshes, etc. It is used to run a chain carrying material off of the face. There is a lot of "noise" going on inside when this beast is running.

In this case Vibration Analysis was used after an "audible noise" was heard coming from the gear box. Something sounded like it was going to fail, probably a bearing. Should we just replace the whole gear box, or can we find out exactly what is going on inside and fix it? Using Vibration Analysis, we checked the drive while it was in service and running underground.

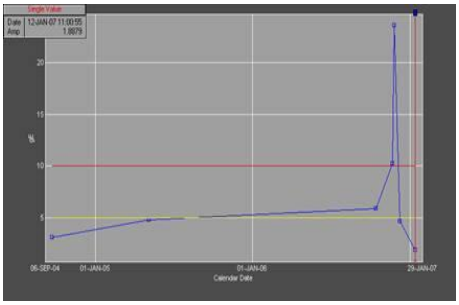
The individual spectrum to the right is showing a peak with sidebands and a raised noise floor at around 15000 CPM with amplitude of almost .25 IPS (Inches Per Second). The suspect bearing has been overlaid with the spectrum. The peak at 15093 CPM matches the calculated bearing defect of the 1st intermediate shaft gob side bearing (NU230), labeled "D" on our simplified drawing at the top of the page.

It was determined that the bearing was accessible and able to be replaced underground. It only took one shift (8 hours) and was able to be scheduled to coincide with a planned maintenance shutdown!



The bearing was replaced and the gear box went back into service immediately with almost no loss of time.

The graph below shows the measurement of the overall level of vibration inside the gearbox over time. The tall peak was there at the time the bearing was going bad and was what was telling us there was a problem and further analysis of the gear box was needed to define the problem. As one can see, after the bearing was changed, the level of vibration came back down to its normal level.



- *Total loss in repairs and downtime to replace a whole gear case can cost up to $500,000.*
- *With proper vibration testing total gear case replacement can be avoided*
- *Preventive maintenance is necessary when working with machines to ensure top performance and output*

Spend a little money now to save big money later.

Picture of actual bearing that was replaced. One can see obvious spalling of the inner ring proving it was near failure

Any questions feel free to contact Larry Massey
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