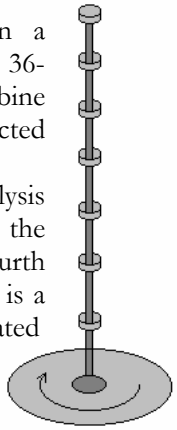
Hydroelectric power plant: Bearing failure

- Hydroelectric power plant with 60-meter shaft
- System Reporter 100 with software version 3



System Reporter was installed in a hydropower plant containing a 36-meter long shaft between the turbine and the generator. The shaft is directed by six supportive thrust bearings.

The pictures below from the analysis software are taken from one of the bearings in the middle (i.e. the fourth from the top). The specific bearing is a slide bearing of hard rubber, lubricated by water. The spectra show Peak values (TOP in the picture) from proxy-transmitters mounted in the y direction (i.e. in the direction of the water flow).

Figure 1 shows a spectrum taken from the bearing in July 1998, before the problem occurred. Only slight instabilities in the bearing are detected, displayed as peaks above the fundamental frequency (1*varvtal in the picture)

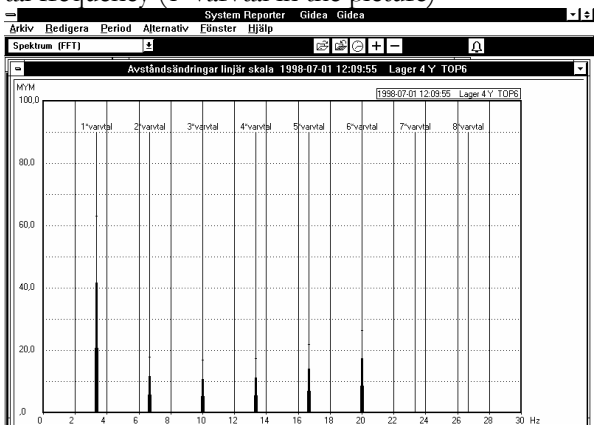


Figure 1. July 1998.

Figure 2 shows a corresponding spectra taken in November 1998. This spectra contain a large peak at half the fundamental frequency (varvtal in the picture) indicating a bearing failure. The probable cause is that the lubrication of the bearing is insufficient. The maximum amplitude of the spectra has increased from 65 µm (MYM in the picture) to above 240 µm.

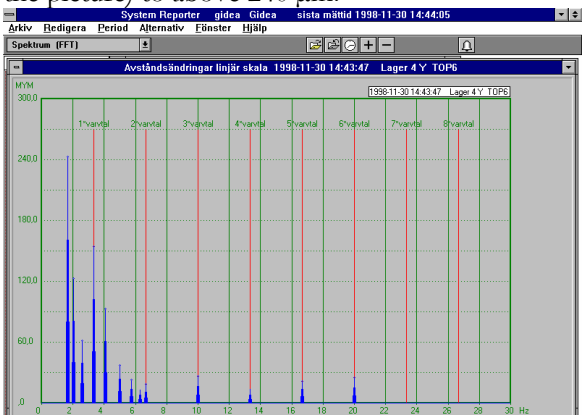


Figure 2. November 1998

The final picture (Figure 3) is yet another single spectrum, taken in December 1998. The amplitude of the highest peak at half the fundamental frequency has increased to 650 µm.

.

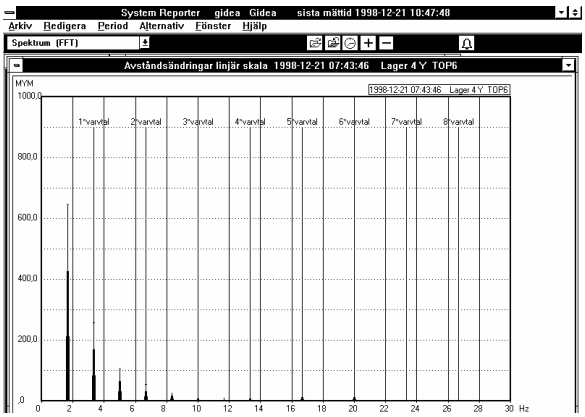


Figure 3. December 1998.

The analysis is yet to be followed up by shutting down the hydropower unit and investigating the bearing. This will probably show that the water supply to the bearing is blocked, confirming the results from the System Reporter analysis. Currently, the unit is run at reduced effect and kept under close surveillance.

Montörvägen 9, S-853 50 Sundsvall, Sweden
telephone: +46-(0)60 61 39 47
facsimile: +46-(0)60 61 39 67
email: info@lagge.se
www: http://www.lagge.se
VAT #: 556053695401