

# SST300 steam turbine overhaul and repair

Pulp mill was suffering from vibration problems at higher loads and was forced to limit their power output in order to prevent trip from vibrations. A lot of investigations had been conducted by other parties in the past without success. Energetic came in to try once and for all to find the problem. We worked together with the customer to check trends from vibrations, pressures and temperatures in order to understand what was happening. External vibration measurements was also done.

A conclusion was made that the guide vanes opening and closing the low pressure part of the turbine was the cause of vibrations. We could see that when power increased to the level where the vanes should open, vibrations started and increased until the machine tripped. Energetic proposed to the customer to open the machine to do a closer inspection and after that cure the problem.

Energetic was shortly after ordered to proceed with the inspection and the turbine was opened. Inside we found that bolts and bolt springs was damaged and had broken off. The reason for this is because of sudden expansion of steam during commissioning or shut down. Slamming the guide vanes causing the bolts to brake. This later escalated the damages on several positions.

The rotor was also found damaged at the first stage seal strips. Energetic shipped the rotor and damaged parts to Stekene for repair. Seal strips was replaced in the workshop and reverse engineering was done on the bolts and springs in order to be replaced. A material scanning was also made to see if improvements could be implemented on that aspect. That theory was true and the new parts was produced in a stronger material.

The parts came back after 1 week in the shop and was assembled, with a total down time of 3 weeks the turbine was started back up again with stable and safe vibration levels also at higher loads.

