

## Sulzer reduces downtime to just 45 days

A geothermal power station in a mountainous area of Indonesia, 780 meters above sea level with narrow access roads, needed a 55 MW steam turbine overhauled. Sending the geothermal steam turbine rotor to the workshop was risky due to the power plant's remote location and unsuitable roads. It was therefore decided to perform the overhaul and repair on-site.

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*Geothermal steam turbines operate in a particularly challenging environment, where chemical erosion can have a detrimental effect on their performance. In order to ensure their continued reliability and efficiency, steam turbines should be overhauled periodically according to the manual.*

Kusno Baryadi, Field Engineer for Sulzer in Indonesia



The detailed inspection revealed some of the erosion shields would need to be replaced

### The challenge

The equipment and spare parts needed for the repair had to be packed into four trucks for transport to the power station. Once set up on-site, the repair needed to be completed within a 45-day maintenance window.

- Narrow access roads meant the turbine could not be sent to the workshop without great risk
- All spares and equipment would therefore have to be transported to the power station, which was situated 780 meters above sea level
- A 45-day maintenance deadline had to be met

### The solution

Sulzer Indonesia has streamlined the on-site repair process for geothermal steam turbines with state-of-the-art custom mobile repair equipment. These tools include lathes, balancing machines and welding equipment allowing field personnel to carry out a variety of services on-site.

- Sulzer experts removed the rotor from the casing, carrying out dimensional inspections, runout checks and non-destructive testing
- The turbine's last stage blades cobalt-based erosion shield was worn, which was sand-blasted, recesses cleaned, then jugged and heated into place
- The labyrinth seal strips were replaced on one turbine-side stage and four generator-side stages
- Seals and the erosion shields underwent NDT procedures, with final low-speed balancing of the rotor before the turbine was reassembled, recommissioned and returned to service



The turbine rotor was installed on the mobile lathe for inspection and repair

#### Customer benefit

Carrying out repairs at the geothermal power station eliminated the risk of transporting the steam turbine rotor from height down narrow access roads. This also achieved a considerable saving in downtime for the power station, which minimized costs associated with the refurbishment project. This approach ensured that the project was completed within the 45-day maintenance window established with the customer. Sulzer Indonesia's provision of mobile repair equipment ensured that this was all possible.



The turbine rotor was also balanced before being reassembled

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