FX-TURBO Evaluation & Redesign

Turboexpander-Generator

Application:
Geothermal Power Generation

Location:
California, USA

Challenge:
For more than 10 years since its commissioning, a non-LAT turboexpander-generator operated with a MTBF of ≤ six months and performed at half its operating point.

Specifications:
Process Gas: Geothermal Steam/Brine
Inlet Pressure: 307 PSIA
Inlet Temperature: 340° F
Power: 12+ MW

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Case Study: Turboexpander-Generator

Challenge:
From its commissioning date and for more than a decade, a non-LAT designed turboexpander-generator processing direct geothermal steam brine within a geothermal power plant continually failed. It operated with a mean time between failures (MTBF) of only six months and the longest run cycle was 18 months.

Solution:
LAT’s engineering evaluation revealed a problem with the Hirth coupling. To address this problem and other operational issues, LAT engineers created an innovative four-lobe polygon shaft-wheel attachment to support the high-speed, power and temperature application.

Result:
The redesigned components reduced centrifugal stress and vibration and increased the power transfer capacity. The revised turboexpander-generator continuously performs at 20% above the prior operating point and now delivers 12+ MW of power output.