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
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.