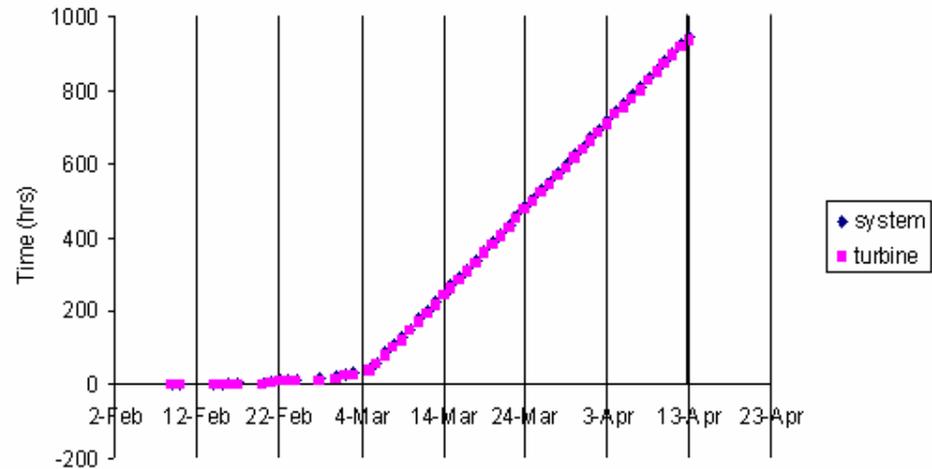


Attachment 1

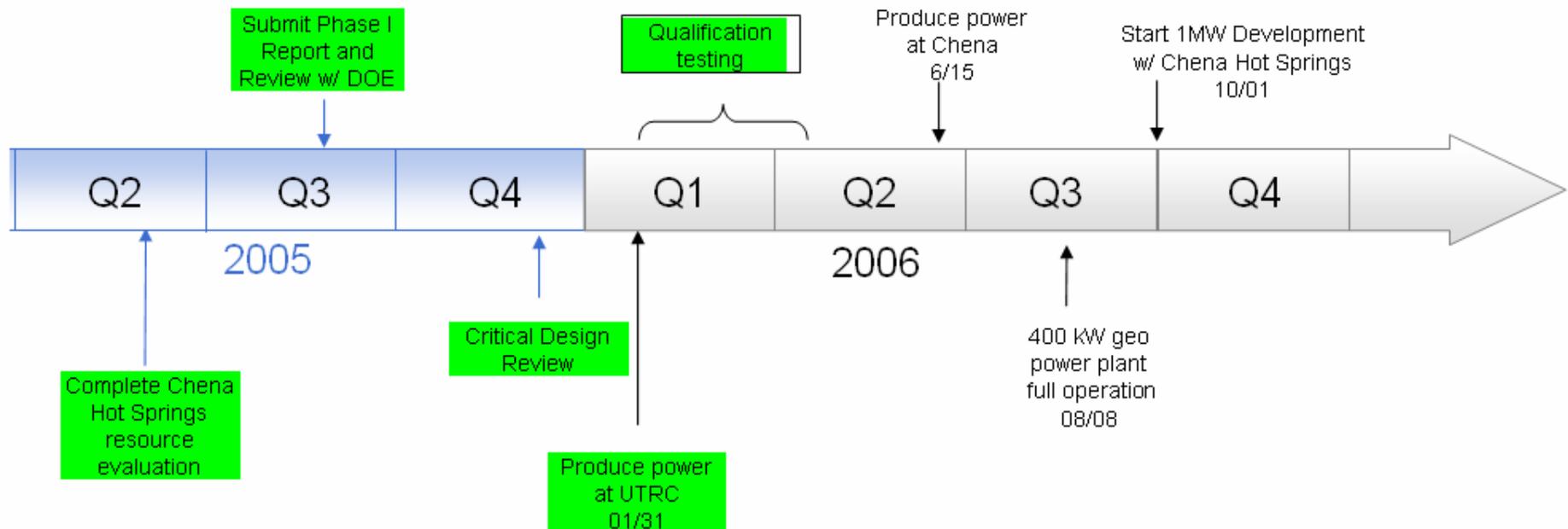
- 1. Timeline for Testing and Installation**
- 2. Summary of the Qualification Testing**
- 3. Graphs showing component startup, operation and shutdown**
- 4. Power variation with change in high-side pressure**
- 5. Power variation with change in low-side pressure**
- 6. Turbine/generator performance**
- 7. Turbine axial thrust**
- 8. Bearing inspection upon teardown**
- 9. Pump inspection upon teardown**
- 10. Impeller erosion do to failed filter at nozzle inlet**

PureCycle - Geothermal

1000 hour test qualification with > 99.9% availability



200kW Power Plant on 165 deg Water

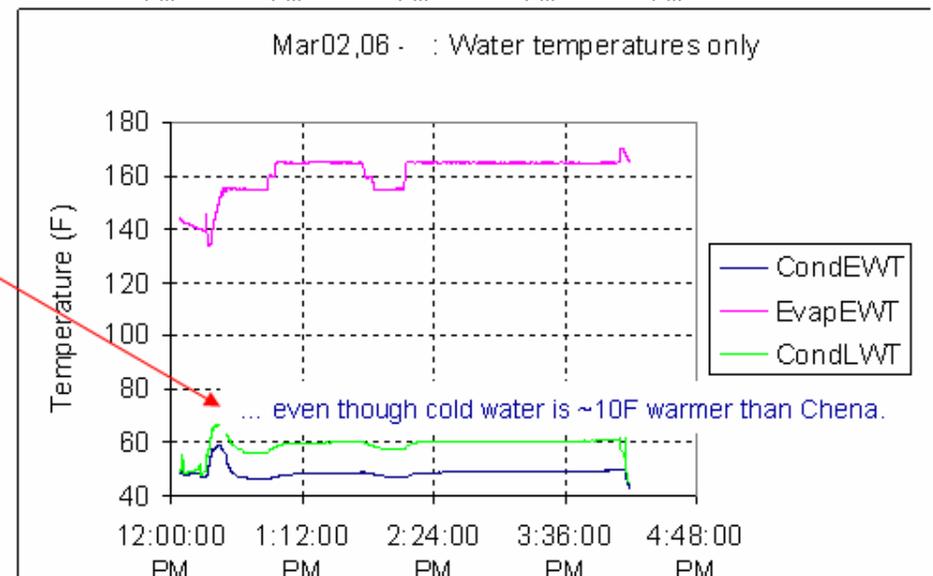
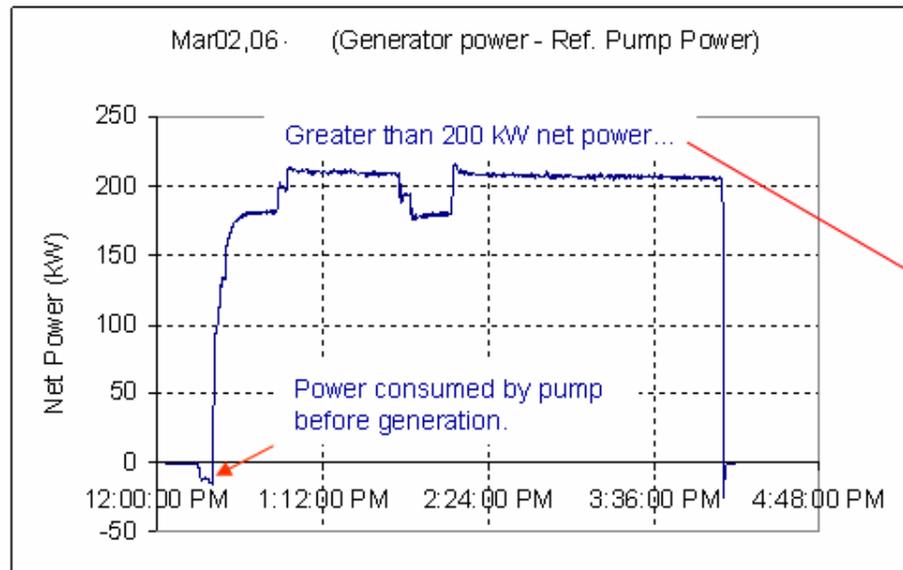
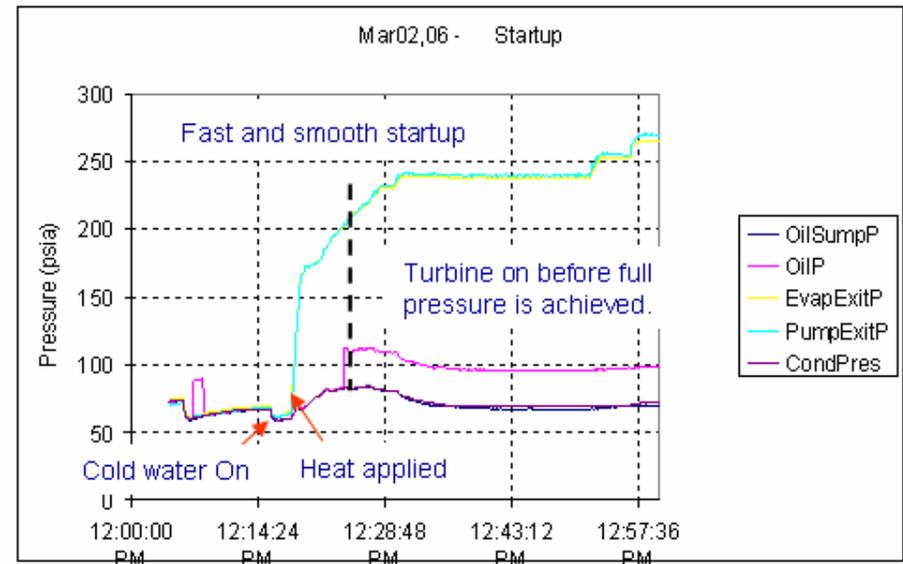
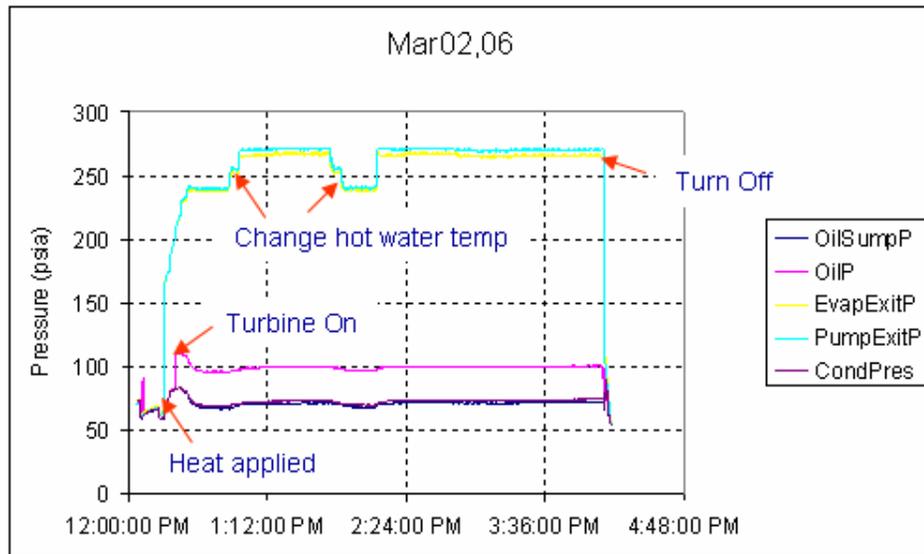


Qualification Test Summary

Performance testing showed Chena condition will produce 230kW (30kW greater than design)

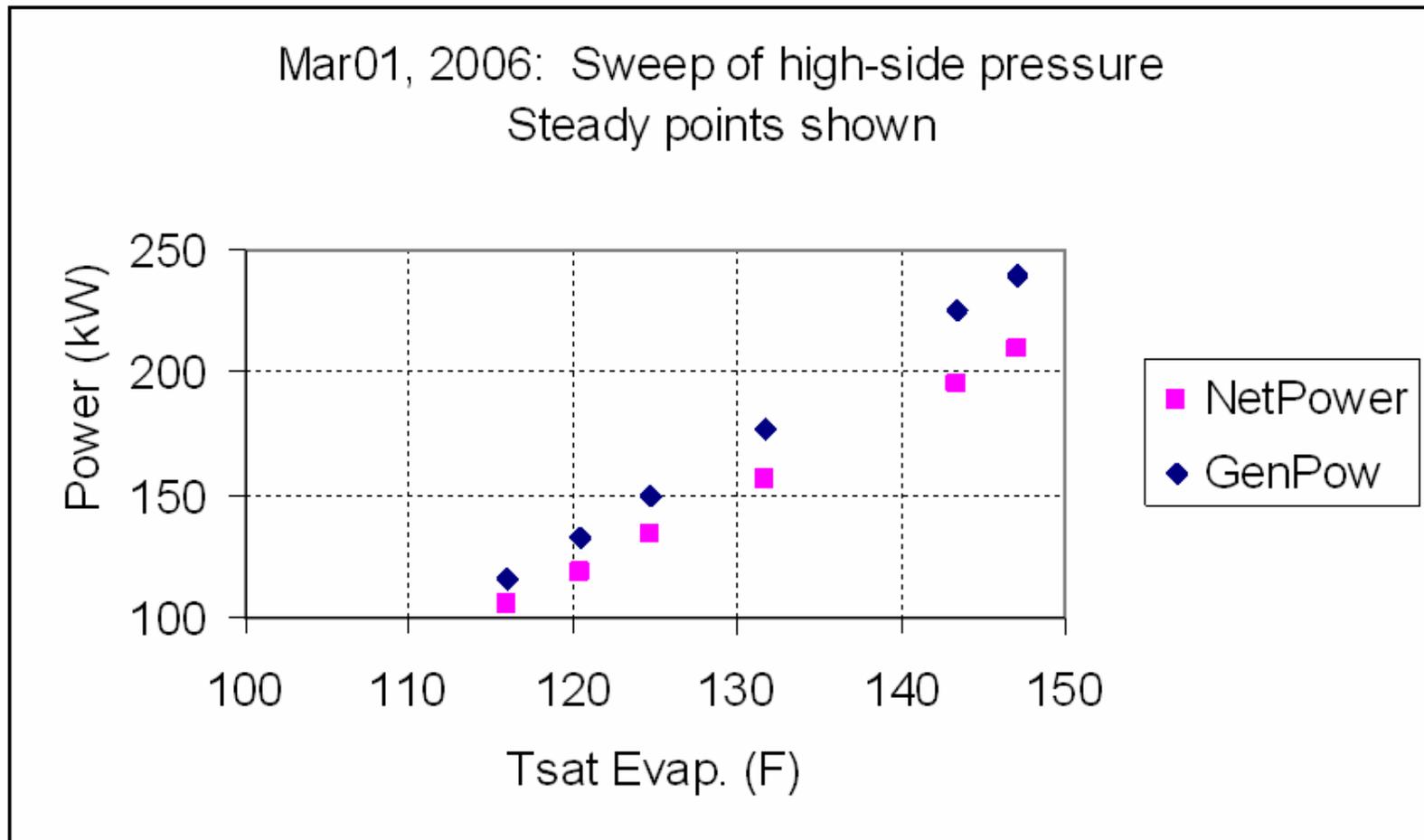
Test	Status
Envelope testing	Complete: Peak power only 245 gross due to cooling tower limitations, Run at stable 83 kW gross power (~60 net).
Turbine Thrust.	Complete: Thrust less than 600 Lbf, lower at Chena condition.
Closed-loop control implementation	Complete: Monitoring: All current monitoring tasks tested with PC-6400 setup.
Sensor failures	Complete: All alarms tested with a PC-6400 setup. Real unit: Level indicator forced to zero, Pump exit pressure unplugged.
Vibration/noise testing.	Complete: Noise measured with and without lagging. Muffler design on hold.
Oil reclaim.	Complete with scavenger.
LOR trips	Complete
Pump Cavitation	Complete: Does not cavitate with large increase in flow rate.
Startup current	Complete: Solid state starter reduced startup current

Smooth Startup, Operation and Ramp-down ✓



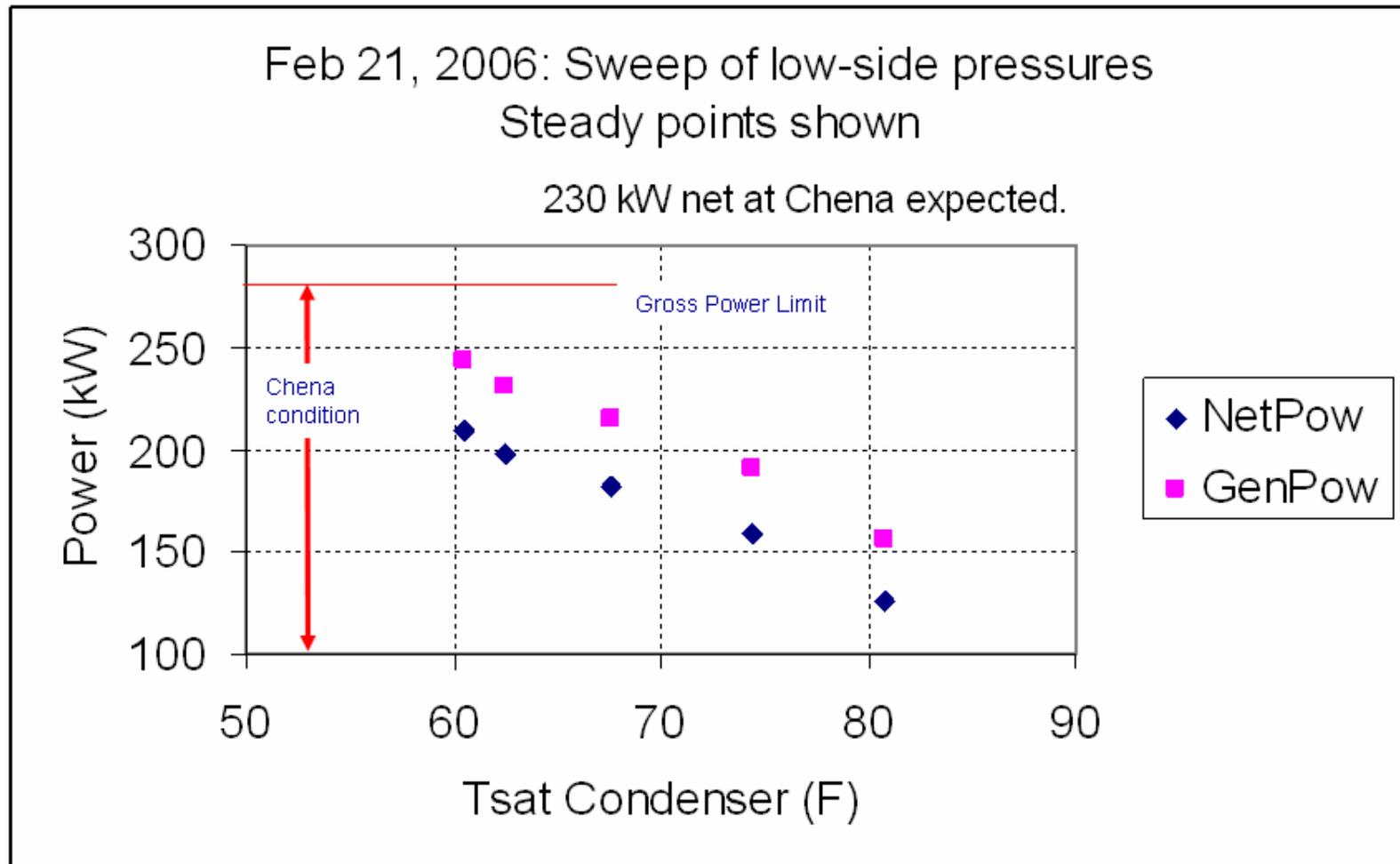
Power Variation with Change in High-side Pressure ✓

Hot water flow rate and temperature was varied to study system response at off-design.



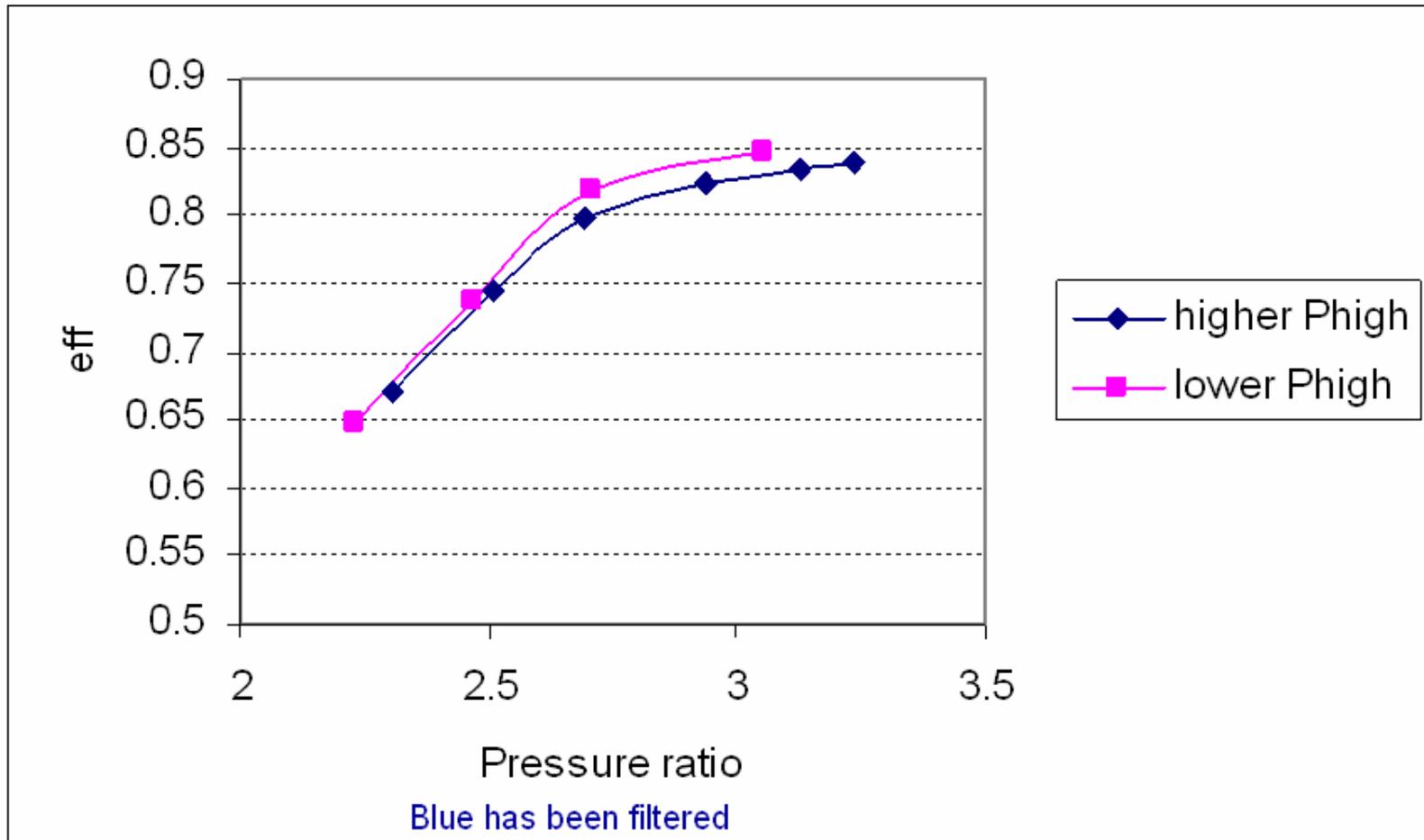
Power Variation with Change in Low-side Pressure ✓

Cold water flow rate was varied to study system response at off-design.



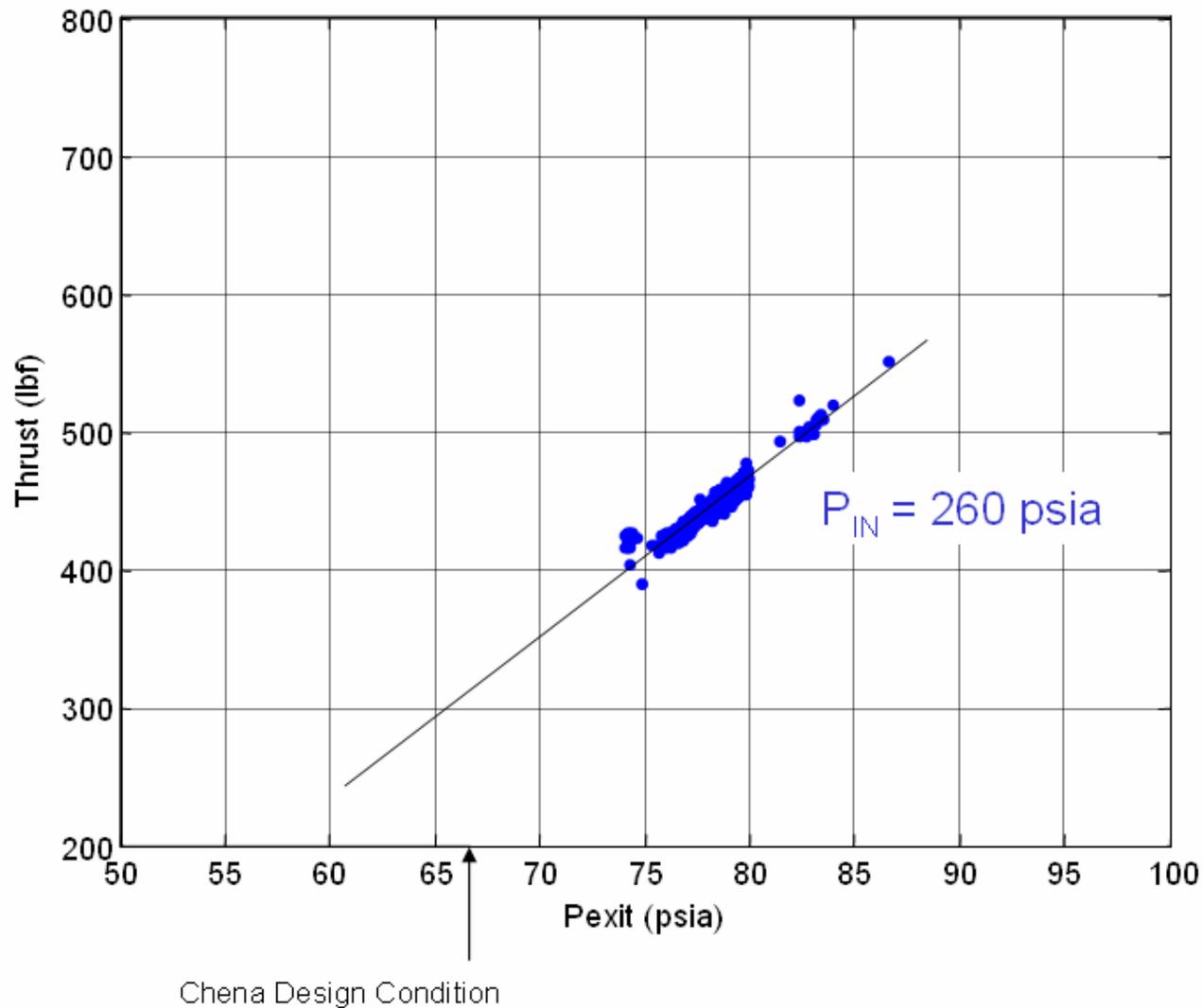
Turbine/generator Performance ✓

Turbine isentropic efficiency calculated from data



Turbine Axial Thrust ✓

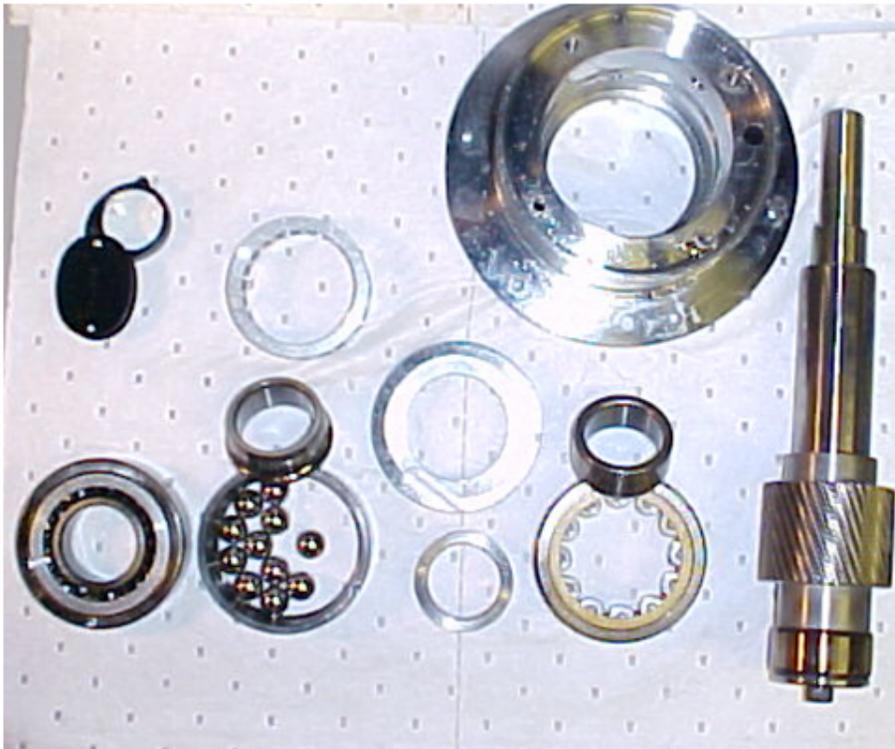
Thrust calculated from pressure data is well below 1200 lb limit



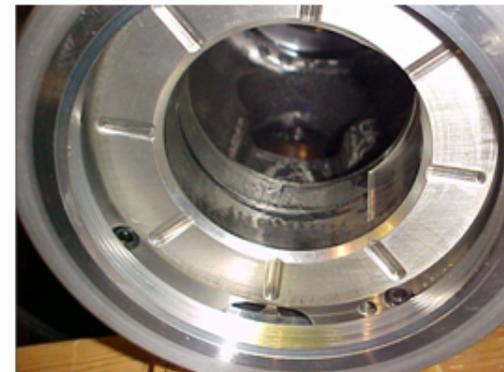
Bearing Inspection ✓

Both high speed and low speed bearings are in excellent condition

High Speed Shaft Disassembled



Low Speed Thrust Bearing



Pump ✓

Filtering upstream of pump reduced/eliminated FOD damage



No cavitation damage on impeller after 1000 hours

Condenser exit filter



Debris – condenser exit

Impeller Erosion – Due to failed filter at nozzle Inlet

Issue is under investigation

