



Elliott Introduces High-Speed Steam Turbine

Optimizing efficiency and reliability

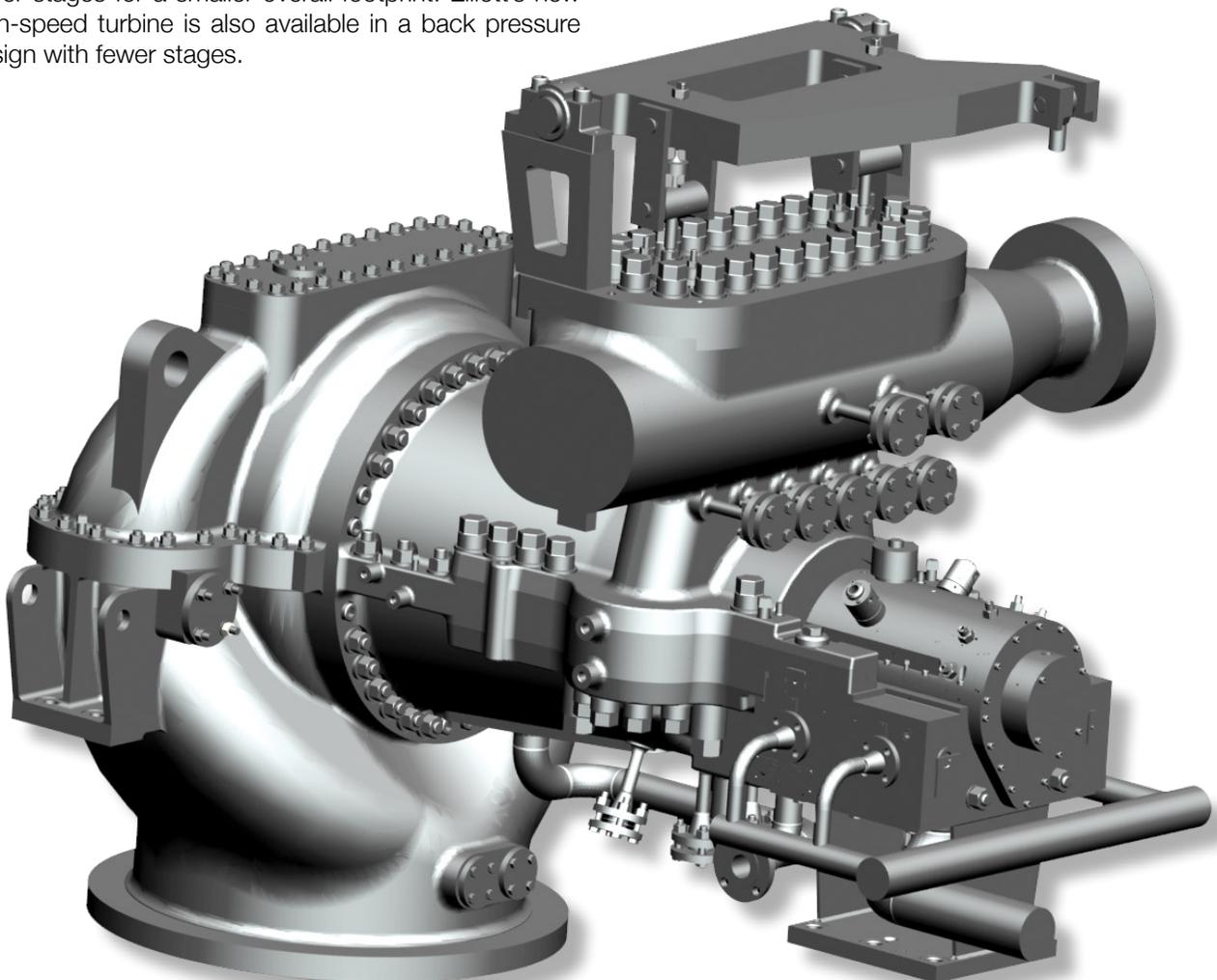
Elliott's new high-speed, high-efficiency multi-valve steam turbine combines the reliability of an impulse style turbine with the efficiency of a reaction style turbine to provide outstanding performance in a range of refinery services. Designed to meet API 612 standards, the new turbine has a small footprint but packs a powerful punch, offering a technical leap forward in speed and efficiency. At typical pressure and temperature* operating conditions, the turbine's efficiency is greater than 80%.

The turbine's high-speed condensing design eliminates the need for a separate gear box which greatly reduces the amount of mineral oil, cooling water, and steam required for high-efficiency operation. The new 13-stage, multi-valve model serves as a direct driver for compressors in oil and gas-related services including hydrocracking, hydrotreating, catalytic reforming, alkylation, refrigeration, gas boosting and coking. The turbine's high speed capabilities allow for smaller compressor frame sizes with fewer stages for a smaller overall footprint. Elliott's new high-speed turbine is also available in a back pressure design with fewer stages.

Features & Benefits

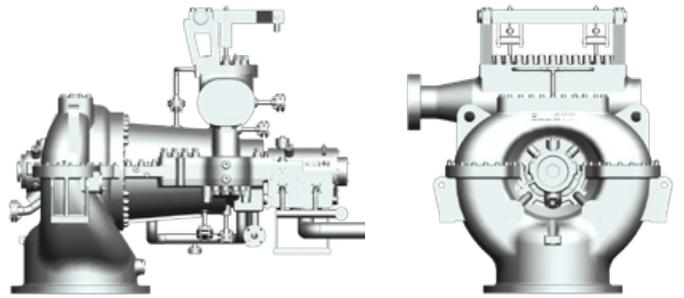
- Direct drive – eliminates the need for a separate gear box
- High performance – greater than 80% efficiency
- Operational efficiency – 12-14% steam savings
- Turbine will speed match the compressor - allows for smaller compressor frame size with reduced number of stages
- Compact casing size – 20% in space savings
- Lower costs – less mineral oil and cooling water required
- Reduced maintenance – fewer spare parts required

* Typical operating conditions: 600 psig / 750°F.
High pressure / high temperature operating conditions: 1300 psig / 905° F



Continuous Operating Conditions

Max Inlet Pressure:	Up to 1300 psig
Max Inlet Temperature:	Up to 905° F
Discharge:	Condensing / Back Pressure
Speed:	13,200 rpm single-flow condensing

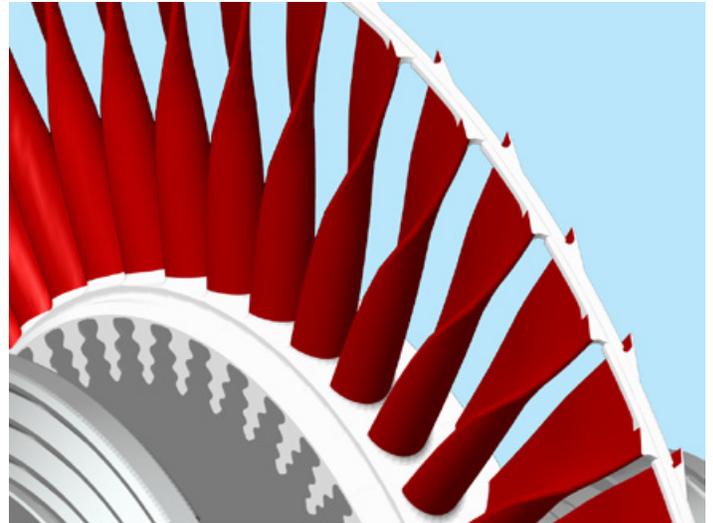


For optimum efficiency, the turbine was designed to accommodate 100% steam admission using a five-valve, bar lift configuration. The steam chest can accommodate multiple nozzle ring base diameters to optimize flow path efficiency. Other features include adjustable end packing, a machined bearing housing with common threading, and a 30-inch condensing exhaust.

Design Highlights

The aeropath for the new refinery turbine was designed to optimize efficiency and reliability.

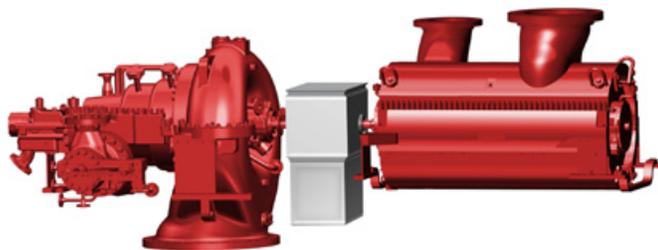
- ♦ Ease of maintenance
- ♦ Improved rotor dynamics
- ♦ Titanium last-stage blading
- ♦ Z-lock shroud for dampening
- ♦ Highly efficient, compound leaned last-stage stators
- ♦ 100% admission, 5-valve steam chest



Compound leaning stators & Z-lock shroud

Advantages of Direct Drive

Typical Steam Turbine with Gear Box



$\Delta = 100$

Direct Drive



- Δ 41% savings on oil flow
- Δ 45% savings on cooling requirements
- Δ 14% savings on train length



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