

Compressor repair saves 50% costs and 66% in delivery time for refinery

CUSTOMER

Refinery

LOCATION

Brunei

INDUSTRY

Downstream oil & gas

KEY SERVICES

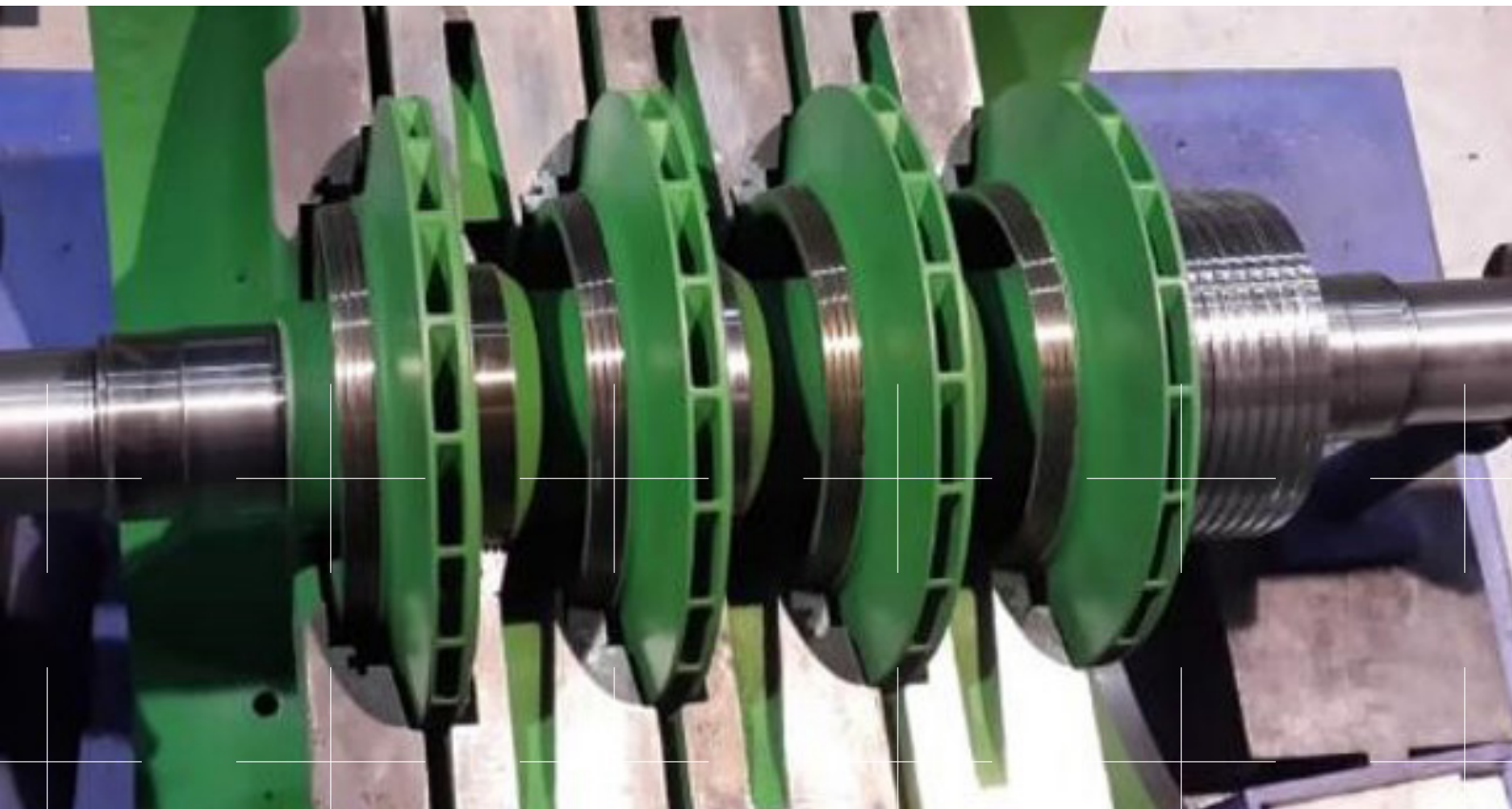
1. Compressors

2. Reverse engineering

3. Rotor repairs

4. Dynamic balancing

5. Coatings



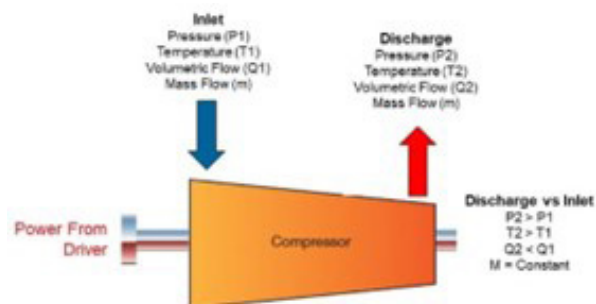
THE CHALLENGE

Repairing a scrapped naphtha compressor for hydrogen duties

After 22 years in service, a centrifugal compressor was condemned by the OEM because it was beyond economic repair, while recommending a new purchase.

Facing difficult decisions due to a shortage of required fleet and the need to keep any downtime to a minimum, the refinery decided to revive the 'condemned' compressor which was put in storage for 2 years without proper preservation.

- With the repute of undertaking challenging restoration projects in revitalizing legacy rotating equipment, the operator called on Sulzer's expertise.
- A comprehensive and methodological inspection revealed the following:
- Impellers and shaft unfit for continued operation
- Parts for the naphtha compressor have a lead time of 18 months from the OEM
- Erosion and corrosion marks occur on the compressor rotor impellers, inner bundle, casing insert and return channel due to fouling



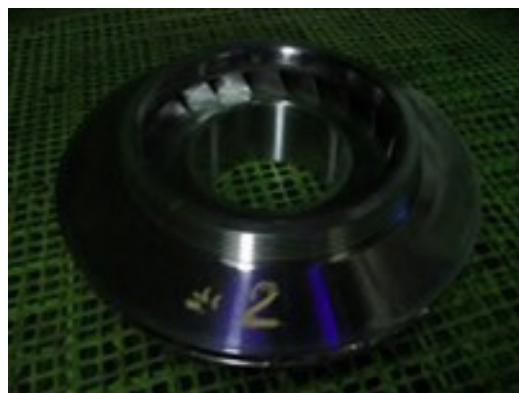
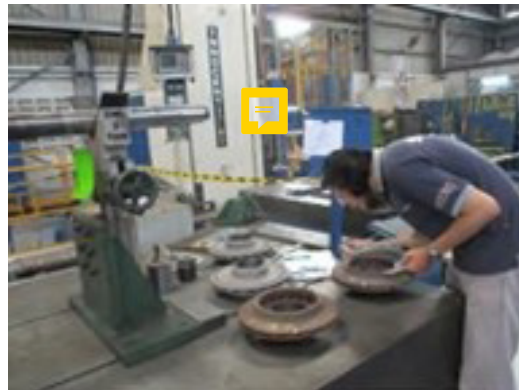
THE SOLUTION

Expert repairs deliver turnkey solution

An in-depth inspection revealed the extent of the damage and established repair strategy along with materials and activities required to complete the repairs

Approach was to restore all components to precise dimensions

- 3D laser scanning of almost 50 damaged components
- In-house manufacturing of new parts, including three impellers, rotor shaft and sealing inserts
- Specialist A24 anti-fouling coating applied to parts in direct contact with the process gas
- A24 anti-fouling coating increases resistance to fouling as well as the smoothness of the component. The coating was applied to the turbine blades, stator, rotor, diaphragm/casing, impellers, and shroud.
- It is applied with a thickness of 3-5 mils (75-125 microns) with a bonding strength of 7-8'000 psi. The final surface roughness is between 30 and 40 Ra (in) at 0.030 in cut-off.
- NDT and repeated dynamic balancing prior to reassembly to ensure optimum performance
- Reinstalled and commissioned by Sulzer field service engineers



THE CUSTOMER BENEFIT

Half the cost in a third of the time

- Faced with a lengthy wait for parts from the OEM or a massive investment in a new compressor, Sulzer's solution to reverse engineer the parts and complete all the repair work in-house, saved significant amounts of time and cost.
- A whopping 50% cost difference was estimated for a comparative new unit offer from the OEM against repair efforts.
- All the new parts were manufactured using the latest materials and technology to ensure precision and durability.
- The revamped compressor now has an additional 20-25 years in service.
- Sulzer's expertise and experience ensured a cost-effective and reliable repair that's best-in-class



“We have transformed a ‘scrapped’ compressor and given it new lease of life for at least the next 20 years, all this for just 50% of the cost of new parts from the OEM”

Iman Sigit, Turbomachinery Product Specialist for Sulzer

PROJECT KEY FACTS

LEAD TIME REDUCTION VS NEW UNIT

12 months

COST DIFFERENCE VS NEW UNIT

50%

EQUIPMENT LIFE EXTENSION

20-25 years

PARTS REVERSE ENGINEERED & PRODUCED

50

FULL OPERATING SPEED

14'318 rpm

COATING PROTECTION FOR CORROSIVE ENVIRONMENTS UP TO

1150 °F

THE IMPACT

Exemplary showcase on how circular economy can be applied for rotating equipment by revitalizing OEM condemned equipment back to operability.

sulzer.com/services

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