

TURBO EXPANDER RENEWAL AND UPGRADES



Operating conditions and capacity demand usually change from the time the plant was built to accommodate new market conditions. The turbo expander performance can be tailored to the new plant operating demands and reduce operating costs. Technological advances also make it possible to increase capacity and efficiency of older units. Our state-of-the-art engineering capabilities and tools maximize the extraction of every BTU of refrigeration in the process.

ACD engineers are experts at analyzing turbo expanders and identifying performance and reliability enhancing opportunities utilizing the latest state-of-the-art tools including:

- ProEngineer and Solid Works (3D Modeling)
- COSMOS-M Finite Element Analysis (FEA)
- Concepts-NREC programs for aerodynamic analysis and blading design (COMPAL and CCAD)
- NUMECA Computational Fluid Dynamics (CFD)
- XL Rotor for rotor dynamics analysis

The use of these advanced tools allow us to confidently perform:

- Rotor dynamics (lateral and torsional) analysis including unbalanced response
- Rerating of existing turbo expanders for higher capacity and efficiency

Other capabilities include:

- Quality assurance enhancement consisting of:
 - 100 % parts inspection and evaluation
 - Fluorescent penetrant inspection of wheels
 - Shaft glitch measurement and correction (shaft electrical run out)
 - Complete component evaluation and report
- Testing capabilities include full speed mechanical testing and cryogenic performance test in general compliance with ASME PTC 10 for true aerodynamic similitude
- In-house “process” analysis and solutions capability

UPGRADES

Reverse engineering with component analysis and evaluation to enhance performance and reliability on non-ACD turbo expanders is a strong ACD capability. Let ACD assess your non-ACD turbo expander with a troubled operating history and we will evaluate and upgrade to provide long term service and reliability.

Whether we are working on one of our own or up-rating one of another manufacturer; every upgrade project begins with a thorough analysis of the plant operation and historical analysis of the machine performance and reliability.

- Output and efficiency gains based on new technology and techniques
- Increased performance and efficiency

- Expander may be rerated to either lower or higher capacity depending on new plant requirements
- Improved reliability using latest technology
- High cycle, low hysteresis expander inlet guide vane upgrades
- Increased reliability
- Zero leakage inlet guide vanes (expander nozzles)
- Rugged rotor design
- Improved reliability and operating range for expander wheel with natural frequency problems
- Full performance testing available
- Improved mechanical reliability by incorporating ACD's proven and reliable rotor dynamic, shaft seal design and high capacity bearing designs



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TEAM CARE

Turbo Expander After Market CARE

- Global services – wherever you are... we are near you! Ready to service you 24/7.
- Downtime equals hundreds of thousands of dollars in lost productivity
- Productivity enhancement program thru renewals and upgrades
- Our extensive worldwide team will provide all planned maintenance, emergency support and other added value services.
- Over 300 years of accumulated experience in cryogenic turbomachinery
- We focus on improving operating profits through energy savings, production efficiency and mechanical reliability.