BORN TO ENGINEER

ENGINEERING SERVICES

Life evaluation of gas turbine casings

Customer

Headquartered in Florence, Italy, the company is part of a diversified advanced technological group. It is a leader in the development and delivery of advanced product and service offerings for the global oil and gas industry. With a workforce of over 10,500 people, it operates across 70 countries with a turnover ~$6 billion.

Requirements

- To evaluate the life of the exhaust casing
- Thermo-mechanical behavior of the exhaust casing to be estimated
- High thermal stresses near the lifting lug region of gas turbine exhaust casing were estimated

QuEST approach

- The assembly components were gauged to analyze the flow behavior and thermal characteristics
- HPT-LPT casing, diffuser & exhaust casing considered to be part of assembly
- 3D and FE models developed from 2D inputs
- Flow parameters (main & secondary flow thermal loads) and heat transfer coefficients studied
- Transient thermal analysis, mechanical analysis and structural integrity of the component analyzed

Results

- Temperature distribution across the turbine operation cyclel.
- Deflection and stress levels predicted the life of the casing
- Stress levels and casing loading conditions validated for structural integrity

Impact

- Effect of radiation considerably effecting the design parameters
- Stresses near the lifting lug region exceeding the allowable limits
- LCF analysis not confirming to the standards due to radial thermal growth in the adjacent casing

About QuEST

QuEST is a leading provider of outsourced engineering services and manufacturing. We provide support across the entire product life cycle from design and modeling through analysis, prototyping, automation, data documentation, manufacturing support, vendor management, and in-house precision machining. Through our Global Product Development frame work leveraging our local presence and global reach, we enable companies in the aerospace, civil structures, industrial products, oil& gas, power generation, and transportation markets to cut product development costs, shorten lead times, extend capacity, and maximize engineering resources. QuEST has delivery centers in India, USA, and Italy, and a footprint in UK, Germany, China and Japan. For more information, please visit www.quest-global.com.