

Sample Circumferential Seal Application: Military Aircraft

- Background

- ▶ Control valve in a military aircraft had a controlled gap circumferential seal with a carbon steel composite ring assembly
- ▶ High wear and carbon ring deterioration resulted in shortened seal life

- Operating Conditions

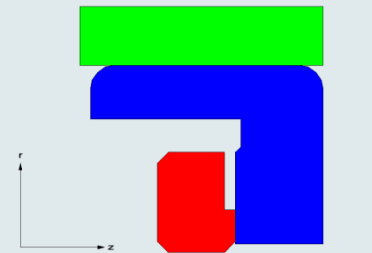
- ▶ High temperature (1,125°F)
- ▶ Pressure (660 psid)

- Determining Cause and Failure Modes

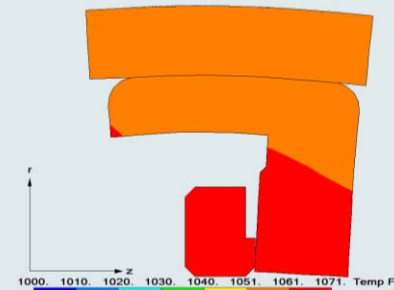
- ▶ High temperature carbon grade oxidizing due to high temperature

- QT Solution

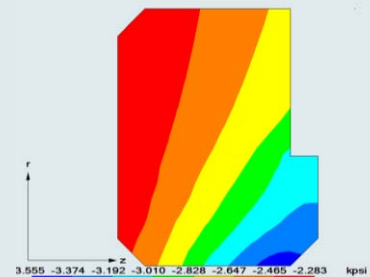
- ▶ Designed a controlled gap circumferential seal utilizing a solid silicon carbide ring, improving temperature rating up to 2,500°F
- ▶ Silicon carbide ring increased seal pressure rating based on FEA generated stress distribution



Seal Configuration



Deflection & Temperature Distribution



Stress Distribution