

Design and Development of Advanced Metal Seals in Casing Hanger



A leading American oil field equipment company

100%
increase in
lockdown capacity

50%
increase in sealing
capacity

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CHALLENGE

Challenges in developing highly critical metal seal due to high plasticity involved. A need to develop a robust Metallic sealing solution to handle 15000 psi with enhanced lockdown

SOLUTION

- Major calculation parameters like pressure capacity, temperature and lockdown force were used to create the conceptual design of metal seal
- Material selection studies, detailed FEA studies and DVP's (design verification package) on multiple metal seal profiles were carried out
- Profile critical to metal seal was finalized by carrying out several iterations of finite element analysis, sensitivity analysis and engineering tests to find out optimal strength required, optimal settings required and adequate contact pressure

RESULTS

- Enhanced capacity of seal to take pressure from existing 10,000 psi to 15,000 psi
- New metal seals enabled well systems to be used in deeper wells providing competitive advantage
- 50% increase in sealing capacity and 100% increase in lockdown capacity