

Case Study

John Crane Dry Gas Seal Refurbishment



John Crane Dry Gas Seal Refurbishment Program: Service Excellence and Expertise for Reliable and Sustainable Operation.



BACKGROUND

Industry: Oil and Gas

Site: Major Offshore Platform

Location: Malaysia

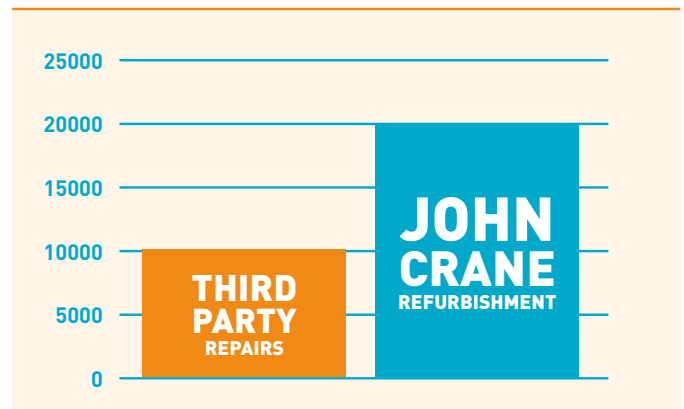
Process: Natural Gas

John Crane's Type 28XP dry gas seals were used within a methane centrifugal compressor. The dry gas seals were sent to an unqualified third party for refurbishment and failed prematurely due to the usage of substandard materials and incorrect repair techniques.

Customer Need

- A major offshore platform in Malaysia required a professional dry gas seal refurbishment program to help keep its mission-critical rotating equipment up and running and avoid an emergency or unplanned shutdown.
- The customer had previously sent their John Crane dry gas seals used in a methane centrifugal compressor to an unqualified third party for repair.
- Shortly after commissioning, John Crane dry gas seals and related components failed prematurely, triggering an emergency shutdown, and severely compromising the safety of the compressor.
- The main Type 28XP seal failure and subsequent Type 83 separation seal failure became evident due to a detector indicating that the Lower Explosion Limit (LEL) had been reached in the bearing housing.
- The dry gas seals repaired by the third-party failed after just 7,000 hours. In comparison, the targeted running time for dry gas seals refurbished by John Crane experts for this specific harsh offshore application is over 20,000 hours.

Running time after refurbishment (hours)



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KEY FINDINGS

- On inspection, John Crane experts discovered that poor-quality materials and incorrect repair techniques had been applied to key components:
 - The thickness of the mating ring was too low. While groove depths were not in accordance with John Crane standards, some grooves were removed.
 - The wrong size of the O-ring for the given seal dimensions had been used. Elongation was visible, along with the incorrect selection of material, which was below the requisite quality and hardness of John Crane standards.
 - Spring design was not in accordance with standards, thus the incorrect spring load resulted in high leakage.
 - Polymers were of very poor quality leading to complete distortion, and polymer garter springs were destroyed, leading to a lack of sealing at the balance diameter.
 - Due to the poor quality of the polymer rings, the carrier also suffered irrevocable damage because of high friction and wear and tear on the hard-coated carrier surface prompting a full replacement.
 - The wrong fasteners had been selected, below the required strength. The fasteners used were not in accordance with standards and were found in a loosened condition.
 - Barrier seal assembly did not meet with standards, while the design of the bushings and the material of construction were non-compliant.

Results

- John Crane dry gas seals are swapped out for refurbishment at scheduled intervals, leaving our service centers in an “as-new” condition, with full warranty.
- John Crane’s dry gas seals reach their targeted mean time between repair (MTBR), which is dependent on the specific applications of our customers.
- In this instance, the John Crane refurbished seals achieved a targeted MTBR of over 20,000 hours for this offshore application.

Solution

- Our qualified technical experts refurbish approximately 2,000 dry gas seals globally each year.
- John Crane upholds the highest technical standards. Our refurbished seals maintain the integrity of design for reliable operation.
- John Crane has over 100 turbomachinery service experts who refurbish dry gas seals in 12 centers located around the globe.
- All dry gas seals leave our service centers in an as-new condition meeting our targeted leakage values to help reduce fugitive greenhouse gas emissions.
- All John Crane facilities, including their service centers fully commit to reducing waste and saving energy. We are on track to meet our company target towards net zero for Scope 1 and Scope 2 by 2040.



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2,000
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GLOBALLY
EACH YEAR



REDUCING
GREENHOUSE
GAS EMISSIONS

If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated.

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