Introduction

The 8648VRS has been developed to provide a robust single seal installation solution for crude oil pipelines located in North America and Canada.

Based around exclusive John Crane secondary seal technology, this seal addresses the typical causes of equipment failure experienced in this industry.

A unique secondary sealing technology developed to prevent hang up and extend reliability in typical high pressure crude oil applications where short seal life and leakage are prevalent.
Common Seal Issues

- Pusher seals, those that use O-rings, can be limited in performance in dirty crude oil applications.
- These challenges have been identified through numerous seal inspections with customers.
- Seals generally require repair before primary seal failure.
Customer Experiences

- Observations point to solids & debris resulting in secondary seal damage and ultimately seal failure.
- The pusher seal relies upon a dynamic O-ring and a stub-sleeve to provide sealing and flexibility.
- Degradation wears the O-ring and stub sleeve making refurbishment more costly
Common Seal Issues and Mitigation

- John Crane **non-pusher** secondary seal technology delivers enhanced reliability
- A more robust non dynamic secondary seal cannot hang up
- A non dynamic secondary seal does not wear the stub sleeve
- A unique approach based on **PROVEN** John Crane sealing technology
A New Approach

Yesterday

- Pusher seal design may be unreliable in dirty applications
- Solids, O-ring fretting can lead to hang up and excessive leakage
- Fretting and hang up can lead to stub sleeve wear and leakage

Today

- UNIQUE, non-pusher design eliminates need for dynamic O-ring
- Longer operational life and potentially lower cost maintenance.
- A novel and innovative design approach to extend seal life

John Crane is the only supplier with a non pusher solution
Product Testing and Technical Solution

Objective:

• Design and test single non pusher elastomer seal for crude oil pipeline services to be deployed in an engineered cartridge.

• Shaft sizes: 6.130”
  5.510”
  3.260”

• Maximum dynamic operating pressure across range: 1500 psig (103 barg) (with the capability of high pressure excursions)

• Temp: Ambient
Product Testing and Technical Solution

Proof of concept:

- 60+ tests and 6000+hrs of dynamic testing
- Shaft sizes: 6.130” and 5.510” and 3.260” fully tested
- Pressure: 2200 psig (152 barg) dynamic and 3300 psig (228 barg) static
- Temp: Ambient
- Speed: 720-3600 rpm

- 1 liquid: Royal Purple RP910 barrier oil (0.82sg / 64cst oil at 100°F/40°C)
- 1 face material combination: 9221 v 9225 (self sintered silicon carbide v reaction bonded silicon carbide)

- Technology patent applied for

Successful testing beyond maximum expected conditions
How it Works – Non Pusher Elastomer Pressure Loading
8648VRS Single Cartridge Seal Head