



Mechanical Seal Analysis (MSA)

RB Work Order #	3743655	Failure Code	MTCE-1
Date	09/20/17	Pump Position	TTP-9
MSA #	2017-091	Seal Manufacturer	Flex-A-Seal
Inquiry #	I-17-0212	Seal Model	75P
Customer	Anchor Seals Inc.	Shaft Size	1.875"
Job #	2161682	Drawing #	-
End User	USS Clairton	Seal Serial #	-
Pump House	Total Equipment Co.	Inboard Rotary Material	Tungsten Carbide
Contact (TEC)	Ron Sipes	Inboard Stationary Material	Tungsten Carbide
Phone	(412) 269-0999	Outboard Rotary Material	Silicon Carbide
Salesperson	Jason DiBiase	Outboard Stationary Material	Carbon
		Elastomers	IB: FFKM OB: Aflas
		Install Date	01/13/2016
		Removal Date	09/09/2017
		Days in Service	605

General Seal Condition

Inboard and Outboard coated in hardened product. (Figure 1)



Figure 1

Seal Face Conditions

Inboard

Stationary: Tungsten Carbide – heat checking, product migration across face

Rotary: Tungsten Carbide - heat checking, product migration across face

Outboard

Stationary: Carbon – ID/OD chipping (Figure 2)

Rotary: Silicon Carbide – fractured (Figure 3)



Figure 2

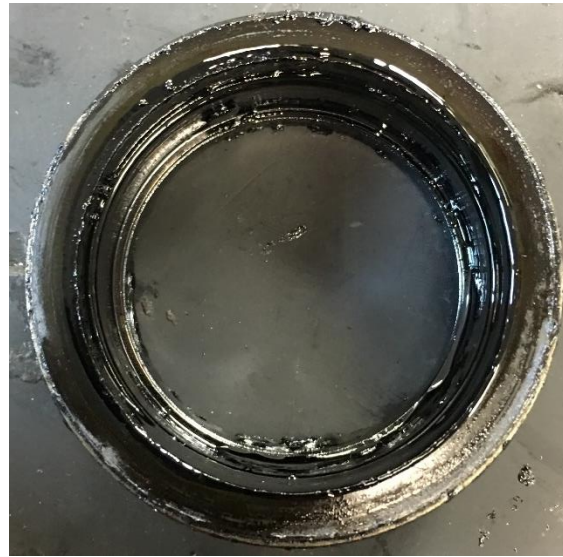


Figure 3

Elastomers

Elastomers showed no signs of thermal, mechanical, or chemical degradation.

Metal Components, Springs, Pins

Sleeve – coated in hardened product

Gland – filled with hardened product

IB rotary carrier – button mechanism damaged (this allows the carrier to lock in place with the sleeve) it is filled with hardened product

Springs – filled with product, not allowing compression

Failure Explanation

It would appear the failure stemmed from the barrier pot not kept at the correct pressure. This causes the product to migrate past the faces. The product will work its way into the seal components causing build-up, eventually leading to failure. In this case the product clogged springs and caused heat checking on the faces.

Recommendation

We recommend the seal pot is kept at 15-25 psi above the stuffing box pressure to ensure adequate lubrication of the clean barrier fluid across the faces. This allows the seal to operate at optimal conditions.