



Mechanical Seal Analysis (MSA)

Job #	2156853	Failure Code	S1001
Date	2017-03-20	Pump Position	Desuper Heating 1
MSA #	2017-048	Seal Manufacturer	FSI
Inquiry #	I-17-0071	Seal Model	1040/SP
Customer	Anchor Seals	Shaft Size	1.3125"
Tag #	1329	Drawing #	FSI-2618-A
End User	USS Clairton	Seal Serial #	02107
Pump House	Total Equipment	Inboard Rotary Material	Tungsten Carbide
Contact (TEC)	R. Sipes	Inboard Stationary Material	Carbon
Phone	(412) 269-0999	Elastomers	Viton
Salesperson	Jason DiBiase	Install Date	03/31/2016
		Removal Date	02/23/2017
		Days in Service	329

General Seal Condition

Stained product on OB (Figure 1)



Figure 1

Seal Face Conditions

Stationary: Carbon – abrasive wear, recessed nose (Figure 2)

Rotary: Tungsten Carbide – recessed groove (Figure 3)



Figure 2



Figure 3

Elastomers

All elastomers had taken a compression set (Figure 4)



Figure 4

Metal Components, Springs, Pins

All metal components had product stained on them (Figure 5)



Figure 5

Failure Explanation

Abrasive wear, as seen in figure 2 on the carbon primary ring, would indicate a lack of lubrication on the seal face. Mechanical seal faces need marginal lubrication for optimal performance. Without lubrication, the seal faces will become out of flatness, causing excessive leakage.

Recommendation

FSI recommends checking the system and flush lines to ensure they are free of debris. It is always a best practice to clean or replace flush lines when installing a new mechanical seal.

Ensure flush pressure is 10-15 psi higher than stuffing box pressure.

The elastomers have taken a compression set. This indicates a thermal degradation.

With the given conditions of condensate at 210° it is recommended to upgrade to Aflas elastomers.