Fluid Sealing International
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Mechanical Seal Analysis (MSA)

RB Work Order #	3332158	**Failure Code**	P1000
Date	04/10/2017	**Pump Position**	P-620A
MSA #	2017-061	**Seal Manufacturer**	PPC
Inquiry #	I-17-0118	**Seal Model**	1500E
Customer	Anchor Seals Inc.	**Shaft Size**	2.125”
Job #	2158169	**Drawing #**	-
End User	USS Clairton	**Seal Serial #**	00885
Pump House	Total Equipment Co.	**Inboard Rotary Material**	Silicon Carbide
Contact (TEC)	Ron Sipes	**Inboard Stationary Material**	Tungsten Carbide
Phone	(412) 269-0999	**Elastomers**	Chemrez 505
Salesperson	Jason DiBiase	**Install Date**	02/20/2012
		Removal Date	02/20/2017
		Days in Service	1827

General Seal Condition

Rotary face fracture could be seen from exterior. Seal had no compression.

Change out information from USS stated pump quit pumping.

Seal Face Conditions

Inboard

Stationary: Tungsten Carbide – abrasive scoring, chipping (Figure 1)

Rotary: Silicon Carbide – Blistering, fractured (Figure 2)

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Figure 1

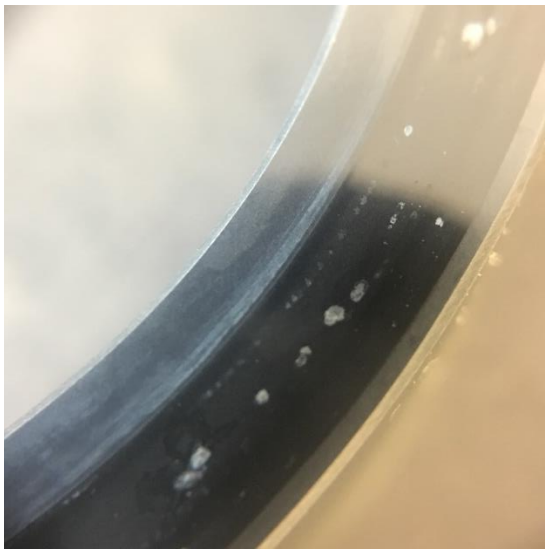

Figure 2

Elastomers

All elastomers showed signs of chemical and thermal degradation. (Figure 3)

Figure 3

Metal Components, Springs, Pins

Debris found in flush port (Figure 4)

All other metal components appeared in good condition.

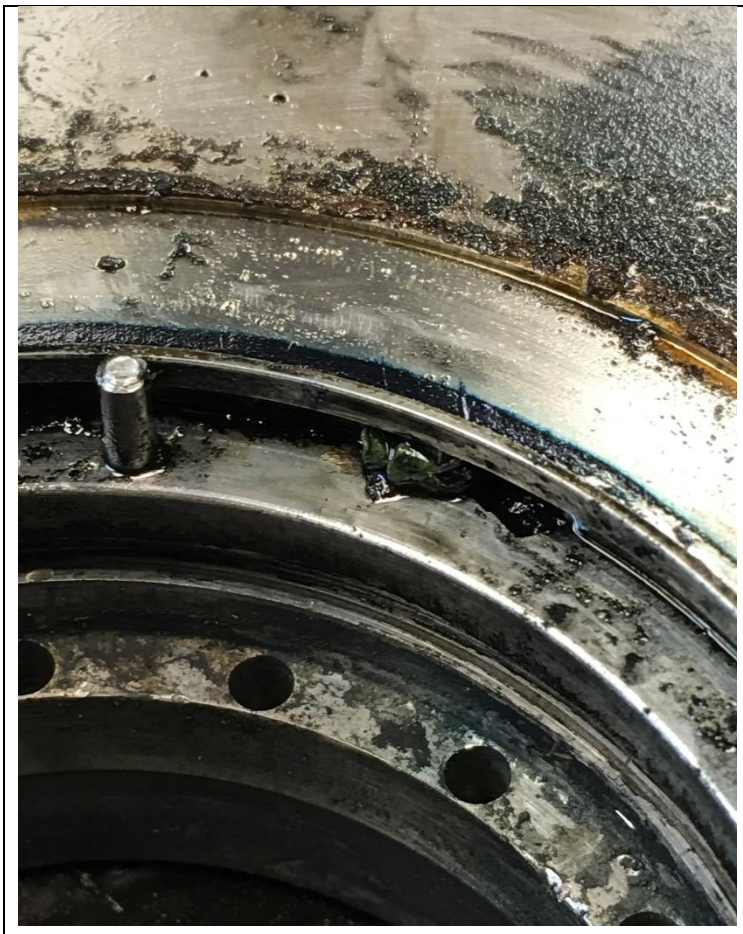

Figure 4: Hard debris found in flush port

Failure Explanation

Change out information from USS stated the pump quit pumping.

Abrasive scoring and blistering would suggest lack of lubrication to seal faces. Mechanical seal faces need adequate lubrication for operation. When the faces lack lubrication it causes the temperature to rise creating blisters. Five years is an excellent run time.

The debris found in the flush port could've caused a lack of lubrication to the faces.

Recommendation

Ensure all flush lines are free of debris by cleaning or replacing them each time a mechanical seal is replaced.