



Mechanical Seal Analysis (MSA)

Date	1/29/19	Pump Position	203A
MSA #	2019-006	Seal Manufacturer	PPC
Inquiry #	I-19-0011	Seal Model	151
Customer	Anchor Seals	Shaft Size	2.625"
Customer Ref #	2176903	Drawing #	A-5116-E
End User	USS Clairton Works	Seal Serial #	00904
Pump House	TEC	Inboard Rotary Material	Tungsten Carbide
Contact	Jason DiBiase	Inboard Stationary Material	Tungsten Carbide
Phone	412-299-6900	Outboard Rotary Material	-
Salesperson	House	Outboard Stationary Material	-
		Elastomers	Chemraz

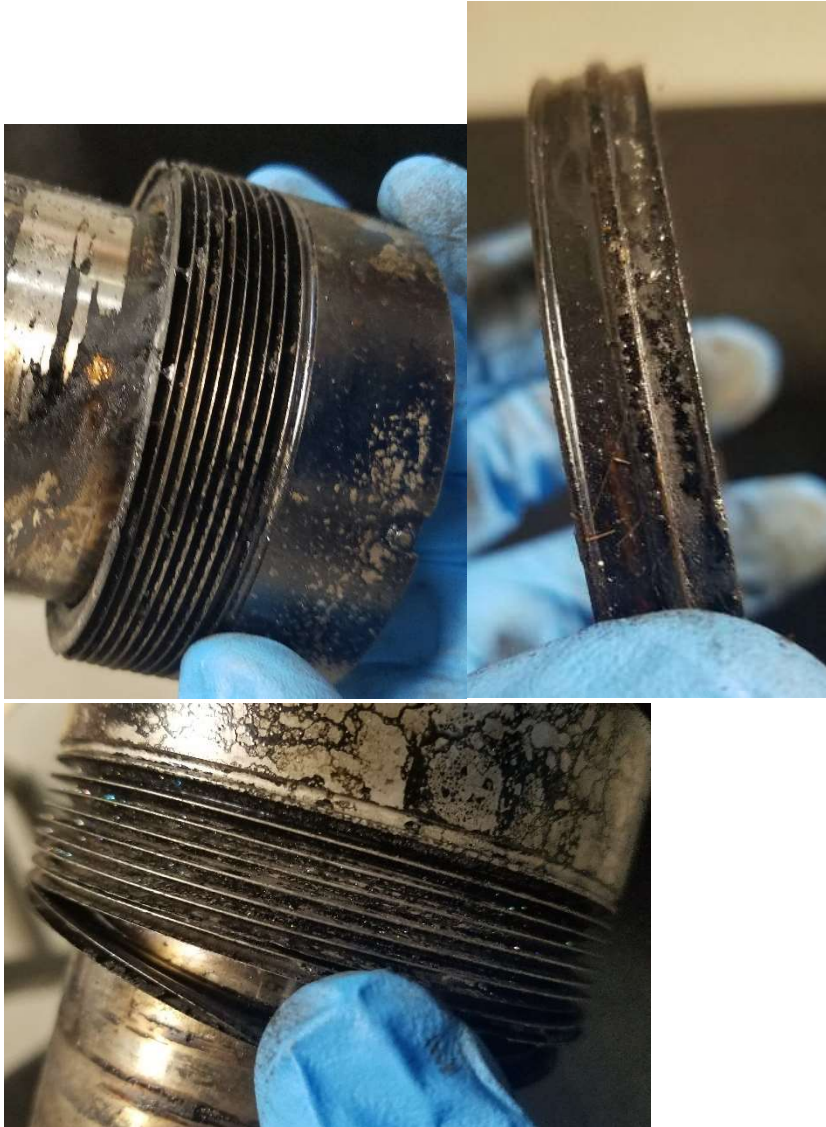
General Seal Condition

Seal was returned assembled. Flush port was open and clear of debris.



Seal Face Conditions

Tungsten carbide face bellows capsule was fractured and came off in two pieces.



Tungsten carbide stationary face was coated with product but shows even wear pattern.



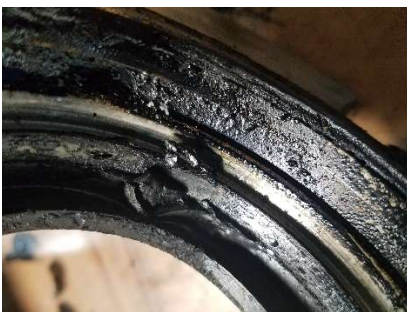
Elastomers

All o-rings were swelled and extruded from sleeve ID, sleeve OD and stat face OD.



Metal Components, Springs, Pins

Gland bore was full of caked on product



Failure Explanation/Recommendation

Failure Explanation: The seal appears to have failed due to the bellows fracture. From the breakage it appears there was a high level of torque at the seal face interchange due to the lack of lubrication. This caused the setting of the process between the seal faces and when the pump turned on the bellows weld at the front adapter broke, which caused the seal to lose its compression and leak.

As a result of the product solidifying, which is noted on the gland and the seal moving caused the orings to extrude from their groove.

Recommendation:

Maintain liquid across the seal faces at all times. Steam trace the stuffing box and/or keep a quench with low pressure steam on the seal to prevent the product from solidifying. A Plan 11 is recommended for single seals with standard bore stuffing boxes. This ensures product is moving from stuffing box and helps remove heat being generated by the seal faces.