



Mechanical Seal Analysis (MSA)

Date	7/5/2018	Failure Code	S1001/S1006
MSA #	2018-045	Pump Position	P-578-2
Inquiry #	I-18-0091	Seal Manufacturer	PPC
Customer	Anchor Seals Inc.	Seal Model	1500
End User	USS Clairton	Shaft Size	3.000"
Pump House	Total Equipment Co.	Inboard Rotary Material	Tungsten Carbide
Contact	Ron Sipes	Inboard Stationary Material	Tungsten Carbide
Phone	(412) 269-0999	Elastomers	IB: Kalrez
Salesperson	Jason DiBiase		
Job #	2171285		

General Seal Condition

The seal was able to spin however it did not have compression. No setting clips were returned. Flush port plugged with ground off metal object. (Figures 1-2)



Figure 1



Figure 2

Seal Face Conditions

Inboard

Stationary: Tungsten Carbide – Product build up and scoring on face. (Figures 3-4)



Figure 3



Figure 4

Rotary: Tungsten Carbide – Small chip on Outer Diameter. (Figure 5)



Figure 5

Elastomers

Both elastomers showed signs of fretting. (Figures 6-10)



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10

Metal Components, Springs, Pins

Gland, sleeve, drive collar and snap ring appeared to be in good condition.
(Figures 11-14)



Figure 11



Figure 12



Figure 13



Figure 14

Springs – Clogged with product. (Figure 15)



Figure 15

Pins – All pins were bent, some worse than others. (Figure 16)

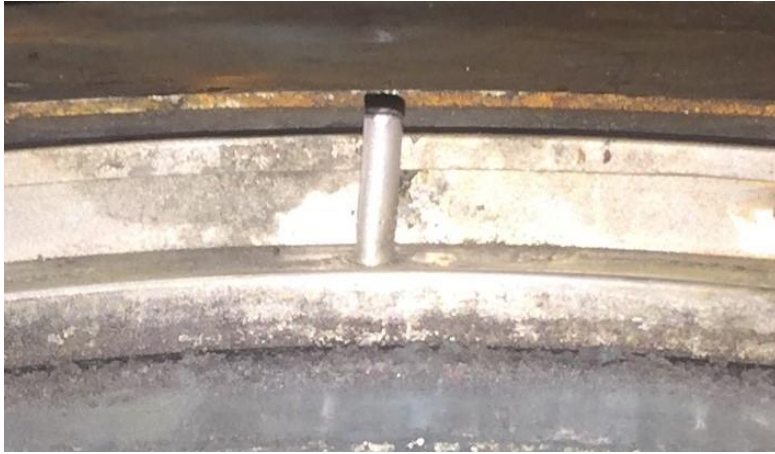


Figure 16

Failure Explanation/Recommendation

This is a pusher style mechanical seal which has a semi-dynamic oring to seal the TC face to the gland. The seal showed signs of excessive radial movement causing the fretting of the O rings. The build up of product on the seal face most likely contained some debris which caused scoring on the seal face. The hard starting and stopping of the pump caused the pins to become bent.

It is recommended that this seal be changed to a non-pusher style like a metal bellows seal. The secondary seals would become static at this point thus eliminating the semi-dynamic oring which showed signs of fretting on this seal. Also ensure pump alignment is within pump manufacturer's specs to eliminate any excessive radial movement.