



CASE STUDY

CUSTOMER

SILICON PROCESSING PLANT

LOCATION

WASHINGTON, USA / JUNE 2009

EQUIPMENT

MAGNETIC DRIVE PUMP

APPLICATION

CARBON STEEL PIPE SYSTEM

PROVEN RESULTS



REDUCED COMPONENT WEARING

IMPROVED PRODUCT PURITY

“ Upon opening the basket strainer we were quite amazed to see the amount contamination trapped by the magnetic separators not only did it remove ferrous material but we also noticed non-ferrous material captured by the magnetic separators.”

- Michael VanDe Vanter, Reliability Engineer

CHALLENGE

Magnetic Drive Pump protection for a 10" carbon steel pipe system that flows approximately 900 gpm of Tri-Chlorosilane & Di-Chlorosilane used to produce silicon for the manufacture of solar panels.

(1) Production downtime from pump failure due to black powder contamination (sub-micron to 100+ microns in size primarily made up of ferrous metals) originating from corrosion and erosion of the transmission lines.

The fine ferrous black powder is magnetically trapped in the impeller drive causing premature wear of the journal bearings, internal shaft, impeller and magnet carrier. (Photo A)

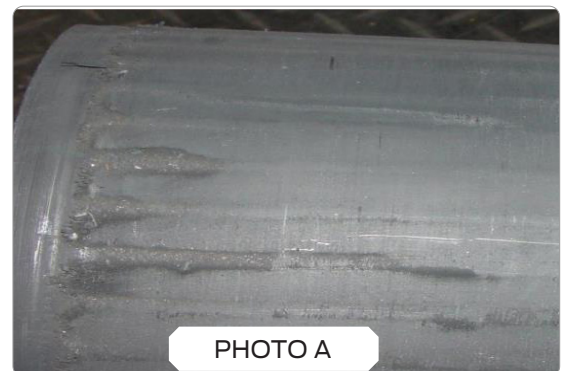
(2) Contamination from corrosion and erosion and other sources compromising product purity.

(3) Identify the cause of premature pump component failure while under warranty.

SOLUTION

Install an OEI magnetic separator basket strainers prior to the pump to remove the corrosion and erosion contamination with minimal flow restriction resulting in:

- (1) reduced component wear
- (2) improved product purity
- (3) Identification of warranty issues related to premature pump component failure.



RESULTS

Photo B – displays a substantial amount of contamination captured by the magnetic separator just 3 days after installation.

Photo C: Close up of the magnetic separator, the arrows indicate contamination later identified as non ferrous. The non ferrous contamination is trapped on the magnetic separator by static adhesion. The static charge is created by flow inside the pipe line and attaches to the contamination. When the charged non ferrous contamination is exposed to our powerful magnetic fields they are magnetically extracted from the fluid and trapped on the magnetic separator element.

Photo D: Is the second cleaning of the magnetic separator this shows contamination captured after 3 more days of production.

To further test the efficiency of the magnetic separators a fluid analysis was performed extracting a sample prior to the magnetic separator and also after. Diagram A shows the results prior to the magnetic separator and Diagram B are the results after, note the significant reduction in Chromium, Nickel and Iron. These results have influence this client to order additional Magnetic Separators for their new facility and are evaluating additional OEI products to enhance their facility.



PHOTO B

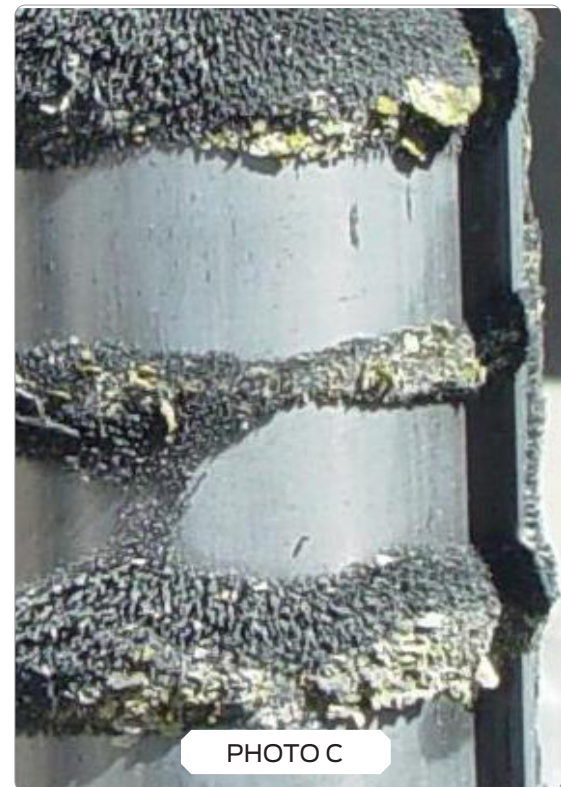


PHOTO C

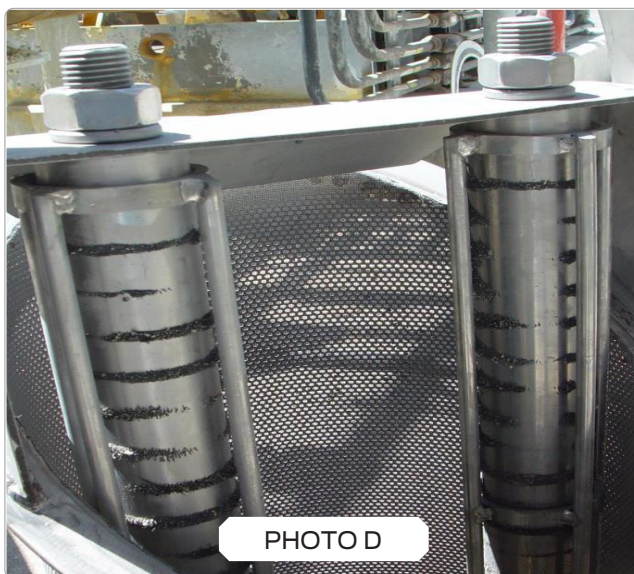


PHOTO D



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DIAGRAM A

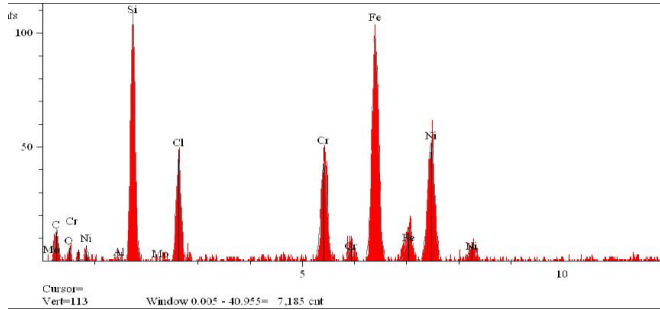
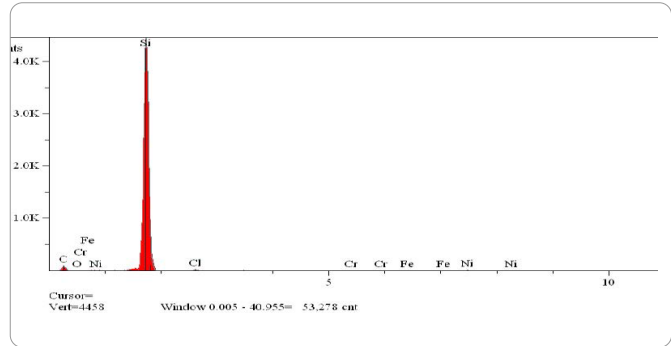


DIAGRAM B



Elt.	Line	Intensity (c/s)	Atomic %	Conc	Units
C	Ka	2.18	42.408	16.356	wt.%
O	Ka	0.76	4.020	2.065	wt.%
Al	Ka	0.38	0.322	0.279	wt.%
Si	Ka	19.49	13.398	12.083	wt.%
Cl	Ka	8.77	4.666	5.312	wt.%
Cr	Ka	10.85	5.273	8.804	wt.%
Fe	Ka	25.88	16.552	29.683	wt.%
Ni	Ka	14.72	13.164	24.811	wt.%
Mo	La	0.34	0.197	0.607	wt.%
			100.000	100.000	wt.%

	Line	Intensity (c/s)	Atomic %	Conc	Units
C	Ka	15.99	53.237	32.618	wt.%
O	Ka	1.21	0.960	0.783	wt.%
Si	Ka	1,061.78	44.965	64.421	wt.%
Cl	Ka	4.08	0.226	0.408	wt.%
Cr	Ka	2.37	0.132	0.349	wt.%
Fe	Ka	2.11	0.142	0.404	wt.%
Ni	Ka	3.84	0.340	1.017	wt.%
			100.000	100.000	wt.%

