

CONTROLLED PERFORMANCE STUDY

INDUSTRIAL BOILER CASE STUDY

7.4% INCREASE IN EFFICIENCY

58% SAVINGS IN BLOWDOWN COSTS



OVERVIEW

Due to the alarming increase in population and rapid industrialization in Pakistan, the drinking water has greatly deteriorated. Not only is the water contaminated with pathogenic microorganisms and often dangerous for consumption, it contains extreme total dissolved solids (TDS) and high salts. This makes for highly corrosive conditions when water comes in contact with industrial machinery.

In an effort to test whether or not Magnation's technologies would be able to better conditions for manufacturing organizations within Pakistan, Naveena (a producer of denim products) chose to test it on a two-ton capacity boiler. This was an ideal test because the boiler is a closed looped system, where water is recirculated and not impacted by other outside factors.

The main focus of the study was to see if Magnation could reduce Naveena's "Blowdown Time," which requires the maintenance staff to shut down operations and clean out any scale or debris caused by the harsh water.



PROBLEM

Naveena has historically been forced to stop production at least 12 times per day (in a 24-hour period) for Blow Down Time. This has been both extremely costly during down time. Additionally, the process reduces efficiency and takes away from other initiatives that could prove beneficial to the success of Naveena's manufacturing processes.



SOLUTION

The Magnation Rainbolt SS 2 was installed in an effort to reduce the TDS and soften the water. The Rainbolt has a 2-inch pipe diameter, has a stainless steel 316 body, and can be installed inline post-pump.

It is used to make water softer and more soluble, which significantly decreases the amount of scale and buildup in the manufacturing process. By using the Magnation Rainbolt SS 2 on Naveena's 12 ton boiler capacity, the goal was to significantly reduce blowdowns and increase condensate water recovery, saving Naveena both time and money.



RESULTS

Tangible results were seen very soon in the testing process. First and foremost, recovery condensate water increased from 974 m³ to 1129 m³ — this translates to a 7.4 percent increase in efficiency.

Secondly, the number of blowdowns decreased from twelve (12) to five (5) per 24-hours, which means more than 58 percent blowdown costs saved.

At the time of testing, both before and after the Magnation unit was installed, the Reverse Osmosis system was malfunctioning and is excluded as a factor in the results.

	DESCRIPTION			REMARKS
1	Blow Down TDS	3500 ppm	3500 ppm	
2	Boiler Water	1854 m ³	1883 m ³	
3	Soft Water	880 m ³	754 m ³	
4	Condensate Water	974 m ³	1129 m³	Increased by 54 m ³
5	Efficiency	52.50%	59.90%	Increased by 7.4%
6	Blowdown/ 24 hours	12	5	Decreased by 58%
RESULTS	Recovery of Condensate Water increased from 974m ³ to 1129 m ³ which means overall efficiency of Boiler increased by 7.4%			
	Number of Blow Downs decreased from 12 to 5, per 24 hours. This means more than 58% Blow Down cost saved.			
	Life of equipment including Boiler and pipes increased since scaling is decreased significantly with use of Magnation.			



CONCLUSION

The Magnation Rainbolt SS2 is an ideal investment for manufacturers in areas throughout the world where water conditions are harsh. With Naveena as a prime example, this case study reveals that Magnation technologies have the power to: (1) increase machinery efficiency, (2) significantly reduce scaling and downtime, (3) increase the life of boilers, pipes, and other machinery impacted by poor water conditions. Naveena claimed "a payback time of less than three months on the investment."