



Massive water savings with improved reliability

A Bio Products manufacturer was concerned about the water used by the sealing systems at one of its manufacturing facility in the USA. In addition, reliability of the seals was unacceptable. AESSEAL® were approached for assistance.

AESSEAL® carried out an audit of the 686 pumps on site and found:

- 567 pumps used dual seals with an API Plan 54 or 55 seal support system. 405 of these seals had flow meter that were set to maximum flow.
- 118 pumps used single seals with an API Plan 2 or 32
- The site consumed 1,087,000 US gallons of water per day to supply the mechanical seals, this water was being taken from the local lake

Reliability of these dual seals was adversely affected due to the quality of the water along with poor installation of the seal support system specifically:

- The flow meters were located on the discharge side of the seal. Best practice dictates flow meters if used should be installed on the inlet side of the mechanical seal
- Undetected water leakage was entering the process and required removal via evaporation
- There were no check valves on the API Plan 54 and 55 systems which was allowing process fluid to flow back into the seal water system causing cross-contamination of the seal water
- The inlet and outlet lines on the API Plan 54 and 55 systems were zipp tied together, this was causing heat issues on the mechanical seal
- Many of the flow meters were clogged up and not functioning correctly.

The costs of these issues were as follows:

Fresh water cost / year	\$511,000
Waste water discharge cost / year	\$547,000
Reliability costs based on 10 repairs / week @ \$2,500 / event (includes seal costs, pump parts and labour)	\$1,300,000
Evaporation costs (to remove water leaking into process)	\$250,000

AESSEAL® recommended installing water management systems on 400 of the pump seals and inline filters to mitigate the use of API Plan 32, 54 and 55 currently installed. Installation of these systems was started in April 2018 and continued until the end of Quarter 1 2019.

To date the following benefits have been realised:

- Elimination of seal water use on 400 pump seals
- Elimination of seal water discharge on 400 pump seals requiring treatment
- Reduction of seal water leakage into the process stream saving on the cost of evaporation
- An estimated 30% to 40% reduction in seal / pump failure
- A significant step to achieving their 'Sustainability' goals
- Estimated water savings to date of 1.1 billion gallons of water
- An improvement in mean time between failure from 28 months to 39 months (and still increasing)
- Savings of \$1.5 million to date.

Prior to installing the water management systems AESSEAL® also provided training to the site engineers. During the training session it was discovered that the plant had been installing booster pumps to support the demand for seal water. AESSEAL® challenged the plant and sent a proposal to the corporate environmental engineer, which engaged high-level visibility into the elimination of the seal water by using AESSEAL® water management systems that had been deployed at other locations. The incumbent supplier was not engaging the customer in upgrading their seal support system to drive seal water consumption down and seal reliability up. Instead, the supplier supplied flow meters which not only were clogging but were mounted incorrectly and opened to full rate flow.



'Saving 1.1 billion gallons of water'

Industry:	Bio-ethanol
Product:	Water Management Systems
Application:	Various
Water Savings:	1.1 billion gallons
Savings:	\$1.5 million (US)
Reference N.O:	CS0023

