



Final Monitoring Report

Awal Dairy

ScaleWatcher (SW) Water Treatment Report for the Steam
Boiler and Ice Bank Application

September 17, 2016



Overview

- Installations of SW IE4 Model in the main inlet 1.5” pipe of Awal Dairy Steam Boiler #3 was on July 11, 2016. (2 layered coil with 42 loops per layer) and SW IE8 Model in the 6” return distribution pipe of Ice Bank was completed on July 18, 2016. (2 sets of coil in series- 30 and 42 loops)
- Initial status for the 2 applications were noted:
 - *Supposedly, the Steam Boiler 3 was scheduled to be open and assessed (July 5, 2016)for its initial internal status but due to the high cost of the gaskets and other spare parts that needs to be replaced upon opening, we just agreed that there are some basic water parameters that is to be monitored in 1 month. This will serve as key indicator that SW is effectively removing and cleaning the internal existing scales.
 - TDS of Steam Boiler will significantly increase (possibly double or triple) its value as compared to the usual value indicated in the analysis results. This is normal in 30-60 days and then TDS will normalize.
 - * Ice Bank application is expected also to have an increase in its TDS value after the SW is to be installed in its main distribution pipe. While SW- Electronic Water Treatment is on-going, it is important to monitor also actual physical appearance of water as a reference point on the level of corrosion affecting the system.
- OperaKool recommended a 100% non-usage of chemical water treatment upon full installation in order to prove that SW is a perfect alternative for the current water treatment implemented by Awal Dairy Maintenance Team .
- Initial water status was noted and checked by Awal Dairy QC Lab Technicians: July 11, 2016
 - Steam Boiler 3 - pH is 10.6 and TDS 2,020ppm
 - Ice Bank - pH 7.5 and TDS 220ppm



Objective(s):

- Provide to the maintenance and management team of Awal Dairy an alternative solution to eliminate scaling, corrosion, algae and bacterial growth and unstable pH condition of the water that is greatly affecting their operational expenses.
- Improve and stabilize water conditions by eliminating the scaling and corrosion with significant reduction of any chemical treatments by 30-80% or in best case scenario of ZERO usage of chemical treatments.
- Provide alternative solution to the client that will protect and increase the life of fittings and other high invested units and will lead to substantial savings for the company with environmental consideration.
- To demonstrate and prove that ScaleWatcher (SW) is a proven, patented technology that has provided solution in water related problems in various application across the global setting.
- To introduce a practical approach that will significantly reduce the high maintenance expenses of the company.



Awal Dairy Steam Boiler #3 with SW Electronic Water Treatment



Steam Boiler#3 Actual Installation of SW Electronic Water Treatment

Actual Steam Boiler unit which will be treated with SW.



The IE2 SW Model installed (July 11, 2016) 2 meters away from the 1.5" inlet pipe.



Steam Boiler#3 Actual Installation of SW Electronic Water Treatment

The 2 layered 42 loops each wrapped around the inlet pipe.

The other side of the unit showing inlet pipe heading towards steam boiler unit.



Water Analysis Report

Awal Dairy
Budaiya, Kingdom of Bahrain

Area where samples taken: Steam Boiler 1, 2 & 3.

Date	Analysed by	Parameters	Steam Boiler 1	Steam Boiler 2	Steam Boiler 3
July 25, 2016	KEMCO Technologies	pH	9.6	10.0	10.6
		TDS (ppm)	656	825	2450
		Fe (ppm)	-	-	-
August 04, 2016	Fine Treat	pH	12.0	11.5	12.0
		TDS (ppm)	4624	3163	7135
		Fe (ppm)	0.09	0.11	0.09
August 23, 2016	Fine Treat	pH	13.0	10.5	12.5
		TDS (ppm)	1160	1953	8713
		Fe (ppm)	0.30	0.20	0.20

Approved By:

Mustafa Saifee
Marketing & Sales Engineer

Summary of Water Analysis of the 3 Steam Boiler Units of Awal Dairy

Steam Boiler #3 showing a very high TDS values as compared to the other to units which are not treated with SW. This is a direct indication that the accumulated hard scales inside the unit has started to be removed with the use of our SW.



Observations:

- The TDS value of Steam Boiler #3 has significantly increased by 21% wherein the initial reading before the IE2 SW Model installed was 2,020 ppm and increased to 2,450 ppm just 2 weeks after the installation.
- The TDS value of Steam Boiler #3 is twice or thrice the TDS value of Steam Boilers #1 and #2. This is a direct key indicator that the scales present inside the Steam Boiler #3 has started to softened and removed by SW.
- No chemical treatment is being applied to Steam Boiler #3 since Day 1 of SW full installation.

Recommendation:

- Install an IE2 SW Model in each of the inlet pipe of the other Steam Boiler units. SW guarantees to protect the said application from scaling and other water related problems; thus making it more efficient and lesser maintenance expenses for the company.

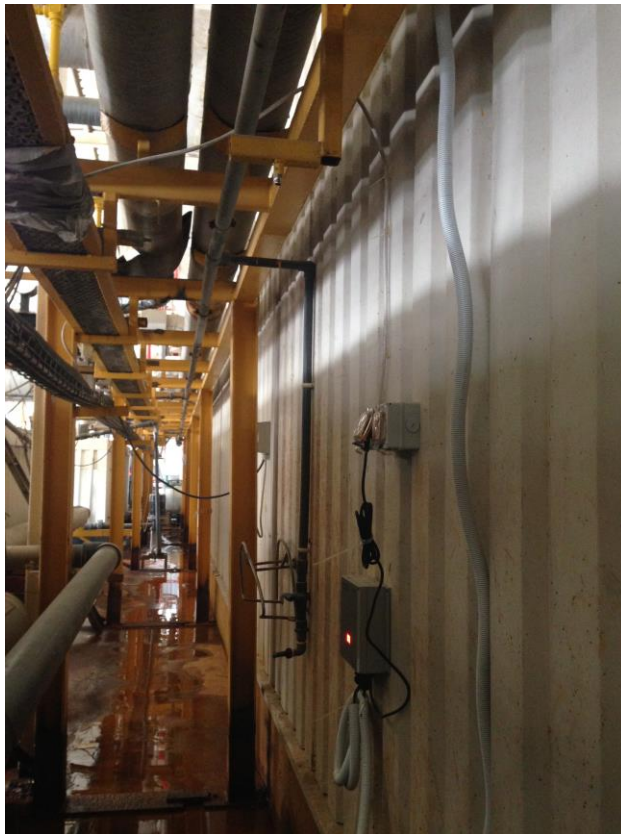


Awal Dairy Ice Bank Application with SW Electronic Water Treatment



Ice Bank Actual Installation of SW Electronic Water Treatment

IE8 SW Model installed 2 meters below the 6" main pipe of Ice Bank system of Awal Dairy



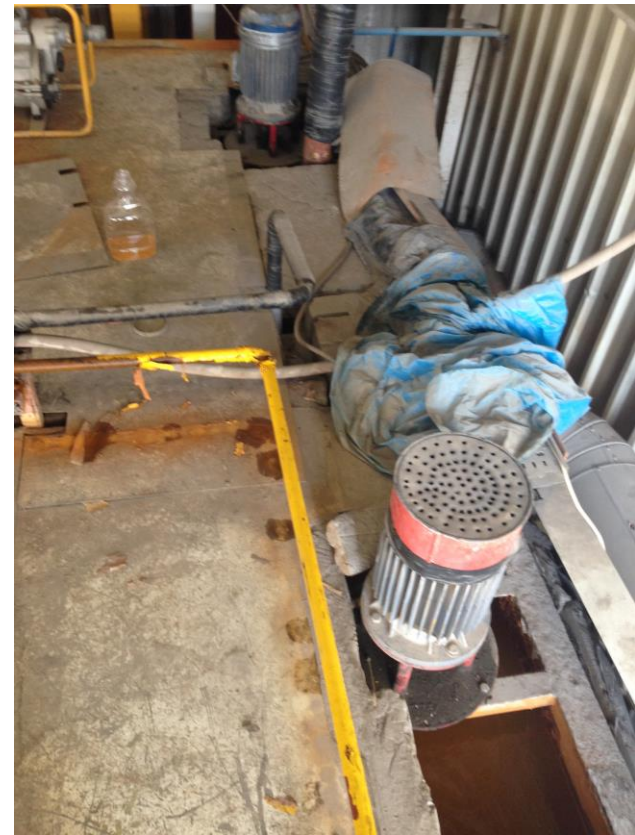
The 2 sets of SW coil wrapped around the main pipe of the Ice Bank- 30+42 loops.



Ice Bank system actual water status before SW was installed

July 13, 2016- The orange color circulating water newly replaced last July 5, 2016.

Ice Bank of Awal Dairy with the water sample inside the bottle on the upper left corner.



Ice Bank system actual water status 43 days after SW was fully installed

August 25, 2016- actual status of the circulating water in the Ice Bank.

The water has better appearance with lesser corrosion indication without any chemicals treating the water. ONLY SW is treating the water.

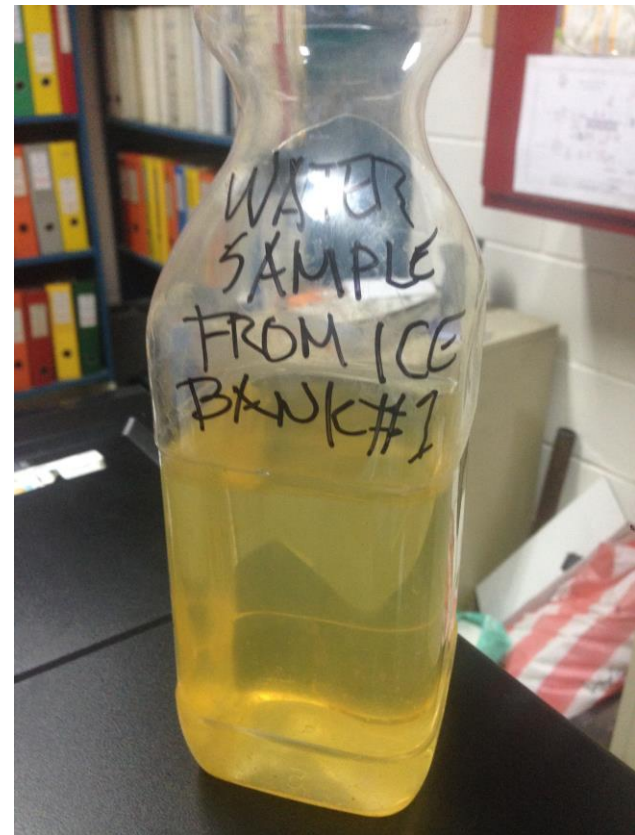


The circulating water in the Ice Bank application without chemicals.

Actual water condition August 25, 2016.



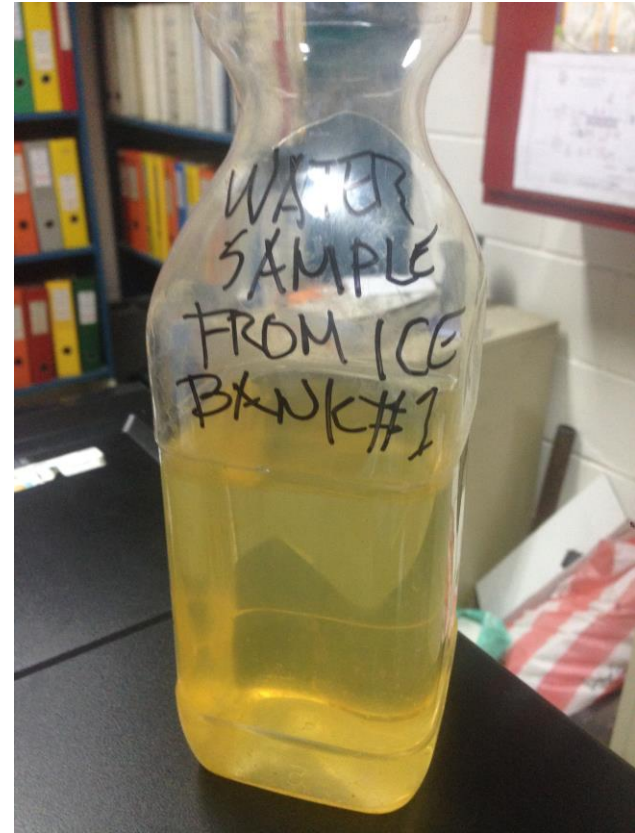
Water sample collected from the Ice Bank- August 31, 2016.



Side by Side Comparison

July 13, 2016- Before SW treatment.

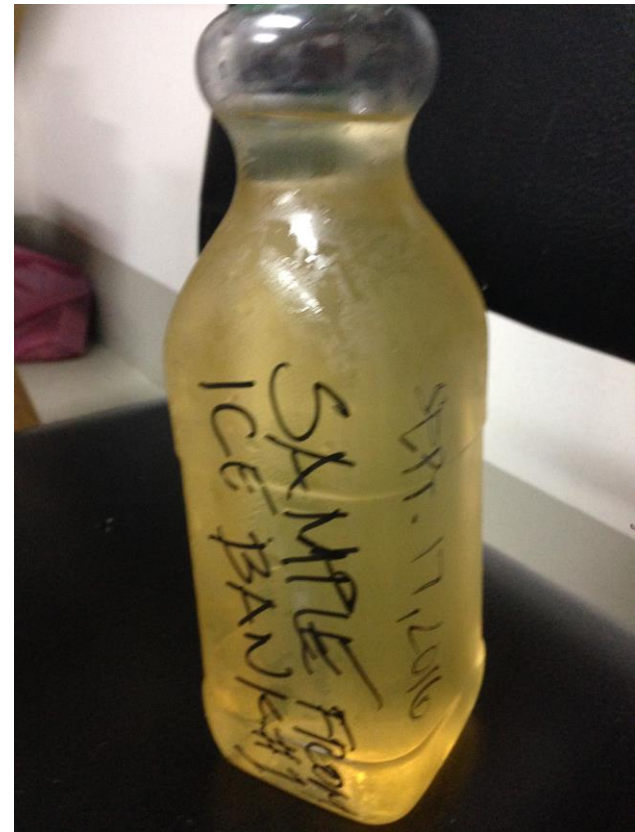
August 31, 2016- 49 days with SW treatment only.

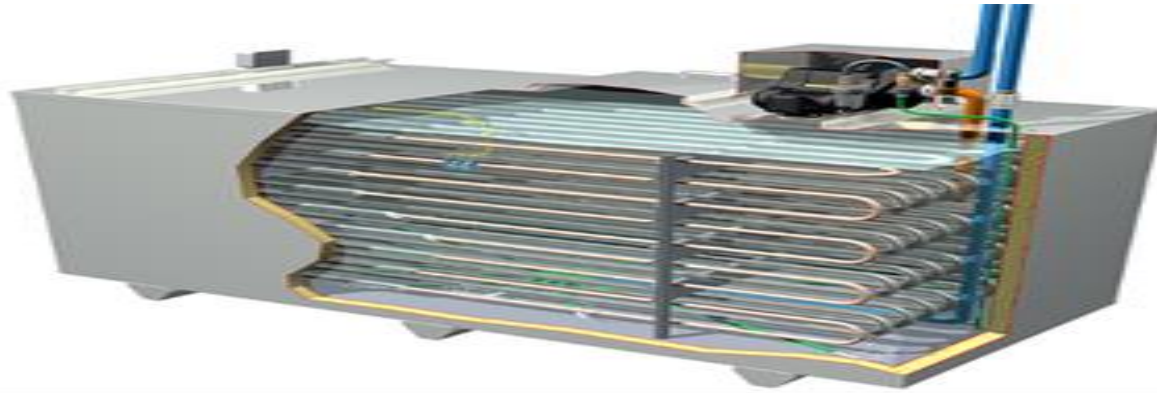
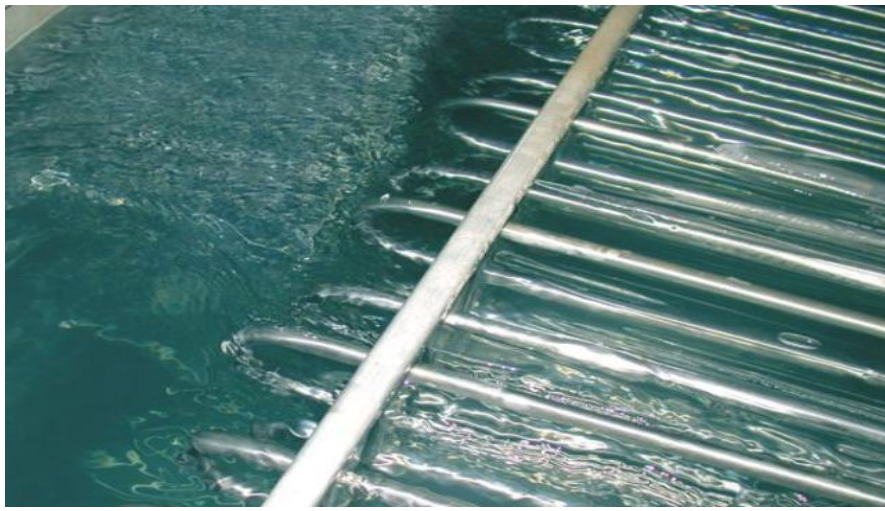


Side by Side Comparison

July 13, 2016- Before SW treatment.

September 17, 2016- 66 days with SW treatment only.





Cooling Coil- A very expensive component of an Ice Bank application.

Typical cooling coil of an Ice Bank which is being greatly affected with corrosion and if NOT fully maintained and protected, it will result to leaking resulting to shutdown and very expensive repair and maintenance for the company.



Observations:

- The circulating water in the Ice Bank (checked last July 13, 2016) was just newly replaced last EID- July 5, 2016. The immediate water replacement was due to the unexpected leaking in the 2.5 year old coil affected by high corrosion.
- The existing chemical treatments is not enough to fully protect the high invested units of Awal Dairy.
- The physical appearance of the circulating water has significant indications that corrosion has been minimized by the SW IE8 Model. From orange to light yellow color implies an effective water treatment of SW without any usage of chemical.
- Water parameters are stable even without any chemical treatment since Day 1 of SW full installation up to present.



Recommendations:

- Install a SE8 High TDS SW Model in the main pipe circulation to fully maximize the protection of the Ice Bank application. The installed IE8 model was just for demonstration purposes to show that SW is effective in providing solutions to water related problems such as corrosion and scaling.
- The SE8 High TDS Model is the appropriate and ideal unit to serve the purpose in fully protecting this application especially the cooling coil of the Ice Bank.
- Secure a 24/7 electrical power connection for the SW Electronic Water Treatment System.
- Regularly check (DAILY) the SW head unit reading and make adjustment with the (+) or (-) sign. Reading should be within the range of 100-103.
- Implement a non-chemical water treatment to further demonstrate the efficacy of our water treatment system- SW.



ScaleWatcher(SW) Guaranteed Product Benefits:

- 24/7 water pH stability ensuring no scaling, corrosion, biofilm and algae to develop in the water; meaning a healthy water source for the users.
- Removes old scale layers and prevents further build-up of new scales.
- Improves cleaning properties of water resulting to lesser amount used resulting to savings for the company.
- Reduces or prevents algae and bacterial growth in the water line (ex. Legionella).
- Eliminates and reduces corrosion and removes rust and replaces it with a black layer called Black Magnetite.
- Zero usage of water softener and other chemical treatments (ex. Broxo Salt).
- No chemicals for descaling.
- No expensive maintenance, non-invasive system and guaranteed environmentally friendly.
- Guaranteed protection of pipeline with lesser maintenance costs and shutdown.
- Prolonged shelf life of existing system or high invested system such as water pumps, filtration and pipelines.
- Increased water pressure in the pipelines and higher water yield for the RO system.



Benefits

–ScaleWatcher will Save

- Money
- Energy
- Water
- Time
- Safe and Environmentally Friendly



Quality Assurance on SW Mode of Action- Health Declaration Assurance Aligned to EU Standards

Health Declaration

Most natural water contains calcium and carbonate ions that form – depending on temperature and other conditions – several crystal structures like calcite and aragonite. Calcite is essential for the human body – so it should remain in the water. But it should not remain in the pipe, as this would increase maintenance costs.

Scalewatcher treatment follows this rule: It does not remove any calcium components from the water, but influences crystal formation. Calcium and Carbonate ions no longer form particles with matted structures, but smaller crystals with a rounded shape. These will no longer adhere to the pipe walls, but are flushed through the pipe by the flow of water.

The Scalewatcher electronic hard water treatment system operates with a signal cable, wound around the pipe work. It emits a weak magnetic and electric field around the inside and outside of the pipe work which affects the calcium molecule formation.

The Scalewatcher system neither adds nor removes anything from the water and there is no physical contact. **So the water quality is not changed by the Scalewatcher. It has no adverse effect on health and can be consumed in the normal way.** In the stomach, the Ca-related content is dissolved by the acidity and available for the human metabolism.

Since 1989 over 300,000 units have been sold worldwide for residential use. There has never been any suspicion that related a Scalewatcher system to health problems of consumers nor has there been any reference to health problems associated with the product from any organization either government or consumer.

Good drinking water is rare and expensive. So SW treatment will not change water quality, but will protect pipes and water related equipment and reduce maintenance costs. That's what the SW is made for.



The World Green Building Council specifies only NON-CHEMICAL water treatment such as the FMW/SW, currently registered with the US and UK Green Building Councils.



OperaKool

ENVIRONMENTAL CONTROLLERS

Your **SERVICE**
SPECIALIST in saving
water, money and
energy for the
Kingdom of Bahrain
and the rest of the
GCC Region



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Testimonials of Satisfied ScaleWatcher Users Bahrain and Other Countries

