



Final Monitoring Report

SULB – Al Hidd

Kingdom of Bahrain

ScaleWatcher (SW) Water Treatment Report for the
Direct Cooling Water System, 12th May 2020



Objective

OperaKool team aimed to **provide solution on the challenges concerning the corrosion and scaling problems in Direct Cooling System of SULB.** The problems related to water in Direct Cooling System was:-

- Corrosion affecting the whole system specially the inner wall of the huge pipes made of carbon steel and also the pumps.
- Bacterial challenges resulting to fouling of the water.
- Increased power usage due to variable water parameters affecting the system.
- High maintenance which is an additional operational expenses of the SULB such as replacement and maintenance shutdown of the pumps and the whole DCW system, periodic cleaning and application of chemical antiscalants.

The problems stated above are the main concern and objectives, this report shows how our team was able to solve them.



Overview

- Installations of 3 ScaleWatcher Heavy Industrial Units that is HIME40, HIME24 and IE8 was done on the pipes with diameters of 20 inches, 18 inches and 8 inches respectively on December 26, 2019.
- Initial status of some critical areas in the DCW were noted:
 - *Hard corrosion and scaling were present in the inner walls of the pipe and affecting pumps and the said water applications.
 - *Biofilm was tested positive in the DCW water.
- OperaKool recommended a reduced usage of chemical water treatment upon full installation of the SW units in order to prove that it is a perfect alternative for the current water treatment implemented by SULB.



Executive Summary

- **Bacteriological Analysis Report** confirms reduction in bacterial biofilm. Bactericide chemicals were totally stopped for one month still ScaleWatcher was able to reduce bacteria count making a saving of \$50,000/- per month.
- **Huge Pumps** had hard corrosion under deposit build-up that has developed through time in the DCW system has significantly removed and converted to Black Magnetite.
- **Pipes** with corrosion and sludge was cleaned through time and reducing corrosion even cleaning the filters of the DCW system.



SW Installation



SULB – DCW System Treatment with SW Electronic Water Treatment



Results of SW on DCW System

Corrosion Coupon

In first month of installation, under-deposit corrosion found on corrosion coupons



After 1 month of installation, reduction in under-deposit corrosion

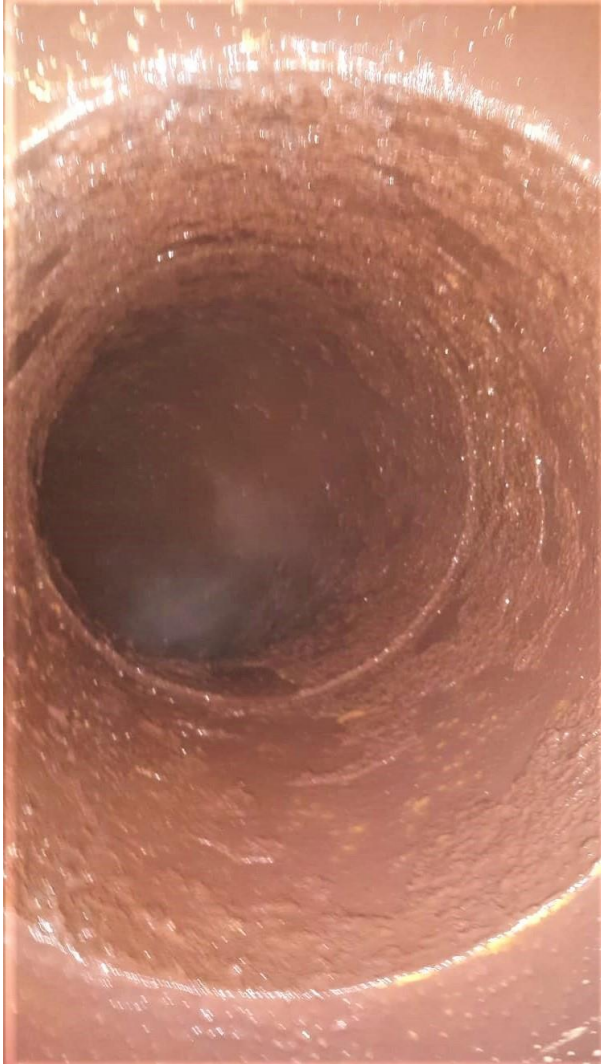


After 2 months of installation, under-deposit corrosion has significantly reduced

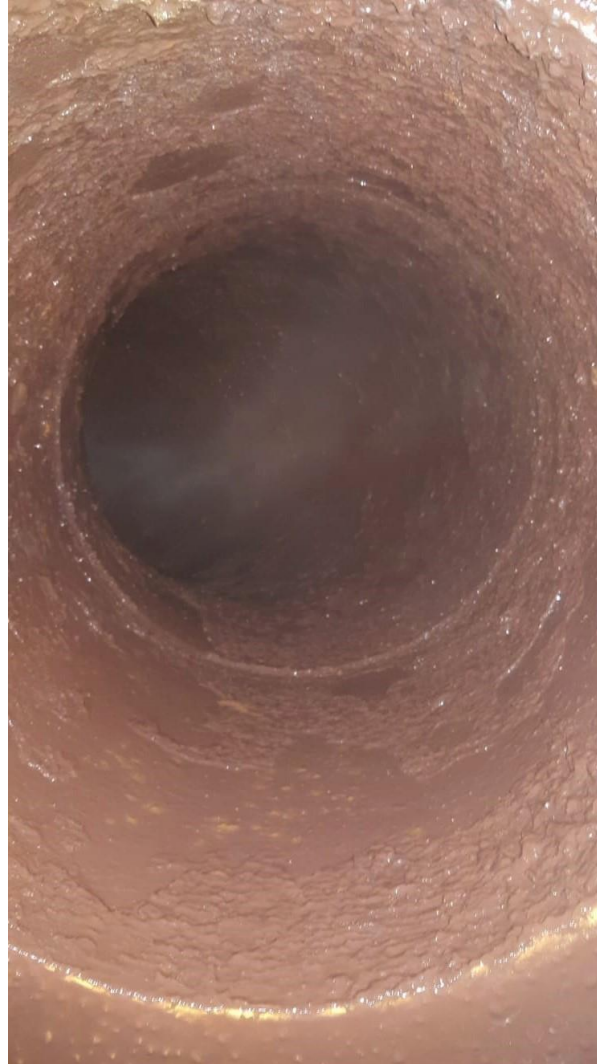


Inside the Pipe

In first month of installation, pipe from inside is reddish and rough surface due to corrosion



After 1 month of installation, reddish has reduced and slightly smooth surface



After 2 months of installation, getting black as process of forming black magnetite has started



Inside the Pump

In first month of installation, the surface is rough due to heavy corrosion and deposition.





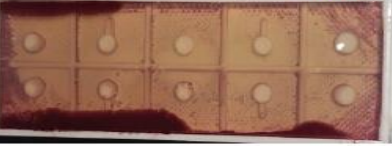









After 1 month of installation, since corrosion is reducing the surface is getting smoother



After 2 months of installation, the surface has significantly improved in smoothness



Bacteriological Analysis Report

S.N.	Sample Description	Analysis	Unit	Result	Limits
1	DCW	Total Count Bacteria	CFU/ml	<100	<10000
					
	4-Jan-20	7-Jan-20	9-Jan-20		
					
	12-Jan-20	16 Jan 2020 DCW supply	16 Jan 202 DCW return		
					
	DCW SUPPLY SHORT RANGE 16 Jan 2020	DCW RETURN SHORT RANGE 16 Jan 2020	20 Jan DCW		
					
	24-Jan	26-Jan	27 Jan Ongoing DCW fills		

Remarks: Last biocide dosage was on 28th Dec 2019 in DCW system.



Return of Investment for SULB DCW

Maintenance

	Without ScaleWatcher	With ScaleWatcher
DCW estimated chemical expenses per year basis	\$ 94,500/Year*	\$ 66,300 (as based on quoted price for DCW - 1 time investment only)
Estimated wages for maintenance staff per year (rough estimate only- labor cost in repair and maintenance of each building)	\$ 50,000/Year	\$ 25,000/Year (estimate only- 50% only of the labor cost in repair and maintenance ; 1st year is covered)
	$\$ 94,500 \times 5 = \$ 472,500$ $\$ 50,000 \times 5 = \$ 250,000$	$\$ 66,300 - 1 \text{ time investment only}$ $\$ 25,000 \times 5 = \$ 125,000$
Total expenses for 5 years	722,500	191,300



ROI Summary

*as based on the average maintenance expenses for DCW per year in the GCC Region

Projected savings for the next 5 years for ScaleWatcher Water Treatment

\$722,500 – \$191,300 = **\$531,200** for DCW system.

- Therefore, total potential savings or income for 5 years for SULB will be

\$531,200 for DCW system

- Potential savings of **\$531,200** for DCW system is a significant amount of money as savings of the company if compared to the initial investment of only \$ 66,300 for DCW in 5 years.



Observations:

- Hard corrosion that has developed through time in the DCW system has significantly removed and converted to Black Magnetite.
- Bacteriological Analysis Report confirms reduction in bacterial biofilm.
- The maintenance team had reduced the usage of heavy chemicals for water to the DCW system.
- The Blow downs have been significantly reduced as the maintenance work has reduced for the DCW system.
- The ScaleWatcher has really worked on the DCW without the usage of chemicals.



Conclusion

- Providing an effective ScaleWatcher water treatment will ensure a significant reduction of maintenance expenses of the SULB, lesser maintenance shutdown of high invested units with longer performance period and minimal concerns on water parameters affecting any system or application.
- Achieving these results will positively increase the revenue of the SULB.
- In order to achieve and maintain the ideal water parameters with a minimal expenses, we are proposing to install an Electronic Water Treatment (EWT) - ScaleWatcher to have a 24/7 water treatment.
- ScaleWatcher is a patented technology from The Netherlands proven to provide solutions to various problems associated with water.
- It is a non-invasive and eco-friendly water solution that guarantees to eliminate scaling, corrosion, biofilm and significantly lower the maintenance expenses for SULB.



Recommendations:

- Secure a 24/7 electrical power connection for the SW Electronic Water Treatment System.
- Monitor the status of the systems and check the inner surfaces of the system and compare to the records of expenses before the SW was installed.
- Check the status of the progress of conversion the red rust and the intensity of maintenance work. This will heal through time by converting the red rust into its beneficial form- “Black Magnetite”.
- Installation of ScaleWatcher for the water line of other cooling systems and water applications to significantly reduce maintenance expenses and provide protection to extend functionality of the said high-value equipment.



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.
- 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



Team OperaKool #@yourservice



Testimonials of Satisfied ScaleWatcher Users Bahrain and Other Countries



Testimonies

Sharjah Electricity & Water Authority
WATER DEPARTMENT
P.O. Box : 150 Sharjah - U.A.E.
Telephone : 06 - 5671114
Telefax : 06 - 5670008



هيئة كهرباء ومياه الشارقة
إدارة المياه
ص.ب : ١٥٠ - الشارقة. ا.ع.م.
هاتف : ٥٦٧١١١٤ - ٠٦
فاكس : ٥٦٧٠٠٠٨ - ٠٦

الموضوع : إجراء تجربة على جهاز إزالة الأملاح والمعادن من أنابيب المياه بواسطة اسمكبل واتشر (Scale Watcher) الهولندي المصنع .

لقد قام مختبر المياه في الإدارة العامة للمياه بالشارقة بتركيب الجهاز في أماكن محددة لمعرفة نسبة الحديد في الماء قبل وبعد تركيب جهاز (Scale Watcher) في كل من مستشفى الأسنان بكلية الهندسة والمجمع السكني بو خاطر حيث أنه قد تم تركيب جهاز واحد في مستشفى الأسنان - كلية الهندسة ولثلاثة أجهزة في المجمع السكني بو خاطر - الشارقة (جهازين في أنابيب توصيل المياه الرئيسية وجهاز في الخزان العلوي) وقدما بإجراء التحاليل وكانت النتائج كالتالي :

مستشفى الأسنان بكلية

S#	PARAMETERS	DIRECT	AFTER SCALE ATCHER	DATE
1	IRON	0.733	0.005	20/07/03
2	IRON	0.494	0.008	19/09/03

المجمع السكني بو خاطر - الشارقة

S#	PARAMETERS	DIRECT	AFTER SCALE ATCHER	DATE
1	IRON	0.134		22/09/03
2	IRON	0.135	0.08	13/10/03
3	IRON	0.134	0.069	22/12/03

وهذا يوضح تأثير جهاز (Scale Watcher) في إزالة الترسبات التي تؤدي إلى تآكل مواسير التوصيل في المباني التجارية والسكنية .
هذا وقد أعطيت هذه الرسالة بناء على طلب الشركة ودون تحميل الإدارة العامة للمياه أي مسؤولية .
ملحوظة : مرفق شهادات بالنتائج .


Michael Datan
Senior Technician
Fraser Suites Seef- Bahrain
Road 2825, Block Al Seef 428, Bldg 2109
Al Seef, Kingdom of Bahrain





November 10, 2016

Recommendation for Scale Watcher

Fraser Suites Seef Bahrain is a fantastic 5-star luxury hotel ideally situated next to the Al Seef Mall. Located in the heart of Al Seef's financial and business centre, this excellent hotel offers superb accommodation in a central location for valued guests.

Providing a well maintained amenities such as the swimming pool as well as the shower area with good quality house water is a daily routine closely monitored by our Maintenance Team.

It is a monthly exhausting routine to us to bring the chemical softener on the 20th floor to regularly treat the main water tank that ensures the normal water supply of our hotel. Another perennial challenge that we encounter is the regular replacement of heating elements situated in each floor of our hotel and the scaling and corrosion that greatly affecting our pipelines and medium size RO unit.

Our challenge to overcome this water related problems was impressively solved when we tried Scale/Watcher which was introduced to us by OperaKool. There were 3 units of the said Electronic Water Treatment(EWT) were installed in our main water tank as well as to inlet pipe to our RO unit. Scale/Watcher models of IE8(after main water tank), IE4(before main water tank), and CM2(inlet pipe before RO) has clearly demonstrated to us very convincing results for the next 60 days after installation.

The cost of the 3 installed units mentioned was relatively very economical to our company as compared to the total costs of the usual water treatment expenses for the next 5 years which is approximately 40% cheaper excluding the expenses of the water heater replacement.

The usual problems and chemical water treatment is no longer being observed which is a very strong indication that this EWT is perfect alternative maintenance free solution. We noticed a significant improvement on the water pressure specially in the 7th floor where some pipe problems has been noted before installation as well as in the shower areas of each room in each floor.

This testimonial is hereby issued to support our satisfaction on the performance of Scale/Watcher.

Yours truly,


Michael Datan
Senior Technician
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Al Seef, Kingdom of Bahrain

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The Fraser Collection
Bahrain, Bangkok, Beijing, Glasgow, Hanoi, Hong Kong, London, Manila, Nanjing, Paris, Seoul, Shenzhen, Singapore, Sydney, Tokyo, Vancouver (2009)
Beijing (2006), Chongqing (2011), Dubai (2006), Edinburgh (2009), Guangzhou (2011), Harbin (2010), Hyderabad (2010),



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January 21, 2016

RECOMMENDATION FOR SCALEWATCHER

Adhari Park is the kingdom's largest indoor and outdoor amusement park covering a total of 165,000 square meters, consisting of various built up areas, green areas along with 3 outdoor lakes.

Ever since the park began its operations in April 2008, maintaining these lakes has been a huge challenge as we had to use large quantities of chlorine and other chemicals to ensure the water remains clean and bacteria free. Unfortunately because of the increased chlorine and chemical levels the water was hazardous for our visitors.

After extensive research and searching the local market we came across Mr. Ali and he offered us a simple solution by the name of "Scalewatcher" which he said would make all our water worries go away, being highly skeptical of his claims the management decided to invest in one unit for testing purposes and to our surprise the effects were visible within a week.

The water was much cleaner, there were no algae or bacteria floating in the water and our cost of chlorine became zero. Looking at this we decided the management decided to invest in two more units and it has been over four years now and we have not had any issues with the units and in the process increasing the longevity of our pushback systems.

Not to mention excellent after sales service and support offered by Mr. Ali and his organization "Opera Kool Trading".

We recommend "Scalewatcher" to everyone and like us you can conduct your own research online to compare and help you make your decision.

Sincerely,

Khayari Ali Salem
General Manager
Adhari Park Development Co.



شركة تطوير منطقة عذاري، ش.م.ب (مفصلة)
Part of Adhari Park Development Co.B.S.C.(c)



Unigate Dairies

Unigate Dairies Limited
Station Yard, Tames
Devon TQ9 5UP

Tel: 0800 865898 Fax: 0800 865899

22nd October 1993

Mr Jeff Clark,
Etcetera Limited
Funtley Court,
Funtley Hill,
Parnham.
Hants.
PO16 7UY

Dear Jeff,

I would like to inform you as to how we are getting on with our trial of your scale watcher system on our bottle washers.

As you know we were experiencing condensation and water droplets on the glass leaving the bottle washer which was giving us high false rejects on our dairy scan bottle scanners.

I suggested that the problem could be caused by water hardness in our washer in the area of 20 - 30 ppm.

Having installed the scale watcher the problem has completely disappeared. While I am very happy with this inexpensive and simple way of overcoming our problem I still have to confirm my trial is complete by turning the system off and monitoring the return of the problem.

In the meantime many thanks for your support and I will keep you informed as and when I have some final results to report.

Yours sincerely

M. R. Allen
Engineering Manager

Registered Office: Unigate 96-98 Victoria Lane, Colchester CO1 1 1SP
Registered in London Number 367206



GFC/RF/16/001
2nd February 2016

RECOMMENDATION FOR SCALEWATCHER

Gulf Air club is a part of Gulf Air company engaged in promoting leisure and recreational facilities to Gulf Air Staff and their families. After initial success of operations these facilities were extended to general public so that they could take advantage of the facilities offered by our company.

Amongst other facilities, we have 3 swimming pools – one which is semi-Olympic in size for Mix gender and the remaining two are exclusively for Ladies. For the past several years, it is the struggle of our maintenance crew to properly maintain our swimming pools. The company's maintenance expenses is a significant budget that really burdens our operational expenses. In addition to this concern is the scaling that we observed not only in some area of our swimming pools but also to the water tanks that we have in the area.

This is a concern that our team seek to have other alternatives to address the problem. Our company was introduced to OperKool which is providing EWT solution to our problem. The basic and simple approach of Scale Watcher to treat water was clearly explained with the support of shared experiences of satisfied customers of the said application.

After careful assessment of pros & cons of the instrument, we have decided to install one unit of IE-8 model for trial basis and within a week's time of installation, we noticed visible changes on the quality of water compared to the past. Scaling in some area in the swimming pool as well as the water tank were gradually reduced and our expenses for chlorine and acid treatment has significantly improved by 25%. Having satisfied with the improvements. The company is planning an additional 2 units to serve the same purpose that we have in our first installation since our problem for high maintenance, scaling concerns and even the not so clear water quality withy intense chlorine odor was really improved with satisfaction by ScaleWatcher.

Sincerely,



Adnan Al Khadem
Senior Supervisor Recreation & Maintenance
Gulf Air Club



Date : August 12, 2004
To : Mr. Mousab Mousa
Subject : Approval Scalewatcher in Steamer

Dear Mousa,

It's my pleasure to inform you about your Scalewatcher unit which you have installed on 17th of May 2004. Our technical engineer had noticed the performance of this unit after 1 week of the installation.

The Scale around muzzles in the steam room became very soft and was easy to remove than before. Also we didn't suffer from this scale anymore because of the effect of Scalewater.

Moreover is no any chemical treatment needed from now to keep muzzles clean and open. The maintenance of the steamer in the steam piping is also reduced. In short, the unit is perfect.

I hope you hereby sufficiently have been informed.

Sincerely yours,



Khalil Khamiri
Asst. Chief Engineer
Engineering Department
Tel No. : 17 586801
Fax No. : 17 580172
Mobile No. : 3 9688845

