



# SOLUTIONS

ELECTRONIC FLUID TREATMENT TECHNOLOGY NEWS

ISSUE 1

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## WHATS NEW



*ETC has launched **ParaDox**, a technologically advanced system specifically engineered for the treatment of effluent.*

## Reducing Limescale helps reduce risk of Legionella & Legionella Pneumophila

### Legionnaires Disease

Legionnaires disease is a severe, progressive form of pneumonia. The Legionella Pneumophila bacteria is a water-based organism, which causes infection when inhaled in an aerosol form. It is normally associated with mains water supplies, cooling towers, potable hot and cold water systems, recirculating water humidifiers, whirlpools spas and Jacuzzis.

### Prevention

Between 100 and 200 cases of Legionnaires Disease are reported each year in England and Wales. One of the major changes in the UK prevention of Legionnaire's Disease is the approach to water management programmes introduced by The Health & Safety Commission's Code of Practice L8 (previously HS (G) 70).

Conditions affecting the proliferation of legionella include:

1. The presence of scale deposits or algae growth in the water.
2. Deadlegs in the pipework or stagnation due to very low use of outlets.
3. Low temperature in potable hot water heaters and distribution systems.
4. Stratification of water in water heaters.
5. Inappropriate water treatment.

Legionella is found in many recirculating hot and cold water systems particularly in larger, complex systems such as those found in hospitals, hotels, office blocks and factories. It is transmitted exclusively by inhalation of contaminated water droplets. High-risk areas are therefore primarily associated with showers, sprays, spray taps, taps with high water pressure and refrigeration and air conditioning cooling towers.

### Scale

Scale is a major problem in both hot and cold water systems. In hot systems, scale can harbour Legionella and biofilms. This provides a perfect growth medium, which disinfectants cannot penetrate. Scale deposits colonised by Legionella can continuously recontaminate a system, even after disinfection.


What is required is a method of continuously inhibiting scale deposition and a water treatment regime, which prevents the growth of biofilms, bacteria and, in particular, Legionella Pneumophila.

### Electronic Water Treatment

This involves fitting the patented **Scalewatcher-ENiGMA** at strategic points in the water system. Treated water will prevent scale from forming in pipework and on heat transfer surfaces, and will also remove existing scale deposits. Chlorinated water would then have a better chance of preventing bacteria proliferation.




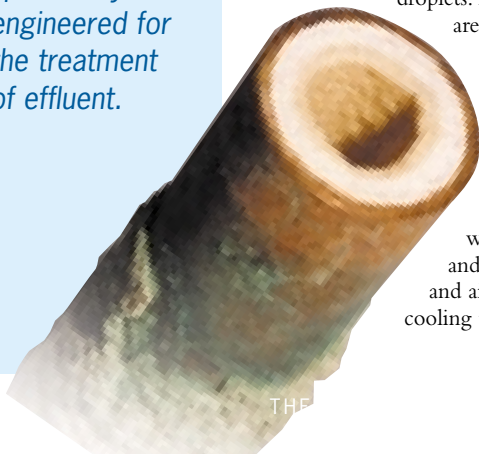
There are many advantages to this non-intrusive engineering solution:

- 1 Energy use is greatly reduced due to heat exchange surfaces remaining free of scale deposits (just 6mm of scale increases energy costs by around 40%).
- 2 Corrosion caused by scale deposits is reduced.
- 3 Extensive downtime and labour costs involved in descaling systems are eliminated.
- 4 A source of colonisation by biofilms and Legionella Pneumophila is removed.
- 5 Water distribution efficiency and pressure is increased by removal of scale deposits which can reduce pipe diameters considerably. 

## Scalewatcher-Enigma leaves pool sparkling

Fort Regent, Jersey's leading Leisure Centre, has made drastic savings on chemicals, maintenance and the early renewal of equipment following the installation of the **Scalewatcher-ENiGMA Olympic** unit on its 25-metre pool and teaching pool. The system has saved around £1600 a year on replacement valves and bundles in the swimming pool heat exchangers.

Previously Fort Regent was using 45 litres of sodium hypochlorite a day but following the installation of the **Olympic** this has dropped by a third, saving the complex around £100 per month. As an added bonus the pools no longer have to use chemical stabilisers to correct the pH balance - a case of a win, win, win scenario. 



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# St. Thomas cleans Angelerys with Scalewatcher-ENigma

St. Thomas Hospital, which together with Guy's forms the largest healthcare trust in the UK, has made substantial savings on its maintenance budget by installing the **Scalewatcher-ENigma** Electronic Descaling System onto four Angelery water generators. The **Scalewatcher-ENigma** system has successfully removed limescale from the Angelerys, which heat domestic water for two groups of buildings within the hospital.

Administering to 101,000 in-patients, 165,000 A&E patients and 403,000 outpatients a year, St. Thomas Hospital's Maintenance Department is fully stretched maintaining facilities. One of the problems facing them was the constant scaling-up of the Angelery water generators providing domestic hot water to the North Wing for wards and

laboratories and to the Lambeth Wing accommodating the Out Patients department in addition to a number of wards.

Until the **Scalewatcher-ENigma** Electronic Descaling System was installed, scale build-up necessitated the frequent downtime of the Angelerys. To monitor performance of the system, ETC installed a data logger, which took



temperature readings of the water every 15 minutes over a 3-month period. This data was transferred to a spreadsheet graph, which visually illustrated that the **Scalewatcher-ENigma** was working

successfully and removing scale from the system.

Nearly eighteen months after the **Scalewatcher-ENigma** system was installed, the Angelerys were opened for inspection and found to be almost scale free.

"They provided a payback within 12 months based on labour, energy and maintenance costs", said Brian Shrubsole. "Now we only open the Angelerys for insurance purposes".



# Geothermal Green Energy Provider Solves Scaling Problems

The UK's first geothermal energy and combined heat and power (CHP) district heating and chilled water scheme in Southampton City Centre is ensuring it maintains its environmental credentials by using state-of-the-art electronic descaling instead of chemicals to prevent scale build-up in its chillers and cooling towers. Launched in 1986, **Southampton Geothermal Heating Company's** £4 million heating, chilling and electricity generation scheme supplies 20 major consumers in the city centre as well as the newly opened West Quay shopping centre, the largest of its kind in Europe.

A well, sunk 1,800 metres below the City Centre, contains water at a temperature of 76°C. This has been utilised to supply a primary heating source for buildings in the vicinity, including Council Offices and two large hotels, the Ibis and Novotel. This well provides about a fifth of the current system's heat input,

operating alongside the CHP units, whose waste heat is recovered for distribution through the 11 km mains network. The district heating scheme helps reduce Geothermal's customers' energy bills by 25% and the City's CO2 emissions by 10,000 tonnes a year.

In 1994 the company decided to use waste heat from the CHP generators to provide chilled water for air conditioning. Initially connected to the five-star De Vere Grand Harbour Hotel, the scheme has recently been expanded to

include the city's leisure centre, West Quay development and the BBC studios.

A water softener was used to control scale in the first chilling system installed. However with a tonne of salt a week being used at a cost of £250, when the chilling scheme was extended four-fold, the company decided to source an alternative means of preventing scale. This was done for cost-saving as well as operational reasons, as the softener could not keep up with peak demand of 100 tons of water per day, resulting in the system scaling.

**Scalewatcher-ENigma** units were fitted onto five linked cooling towers, used in the condensers of six 500 ton chillers. After a few weeks one of the chillers was opened for the first time in 12 months and found to be completely scale free.

"We would have expected to see some residual scale on the chillers and inlet pipe, but both were completely clean", said Mike Zorab, Engineering Manager. "Since then the chillers and cooling towers have remained scale free resulting in reduced maintenance, downtime and less power being used. The units will provide us with a payback within 18 months based on savings in salt alone."

"This was an exciting and fascinating project", said John Thompson, Managing Director, Environmental Treatment Concepts. "We have worked very closely with Southampton Geothermal Heating Company to ensure the **Scalewatcher-ENigma** worked successfully, visiting the site on a weekly basis to check and monitor unit performance."



# Cruise Line goes overboard for Green Solution to Water Scaling

ETC is on course to save a major cruise line substantial costs in downtime, maintenance, chemicals and renewal of water-fed equipment and pipework. The savings follow the installation of the Marine version of the patented **Scalewatcher-ENiGMA** Electronic Descaling system on cruise liners. The **Scalewatcher-ENiGMA** system has successfully treated the scale build-up in the fresh water hot and cold systems, swimming pools, chiller system and the seawater feed to the Nirex Fresh Water Generators.

Scale build-up in the potable water supply and desalination plants on the ships necessitated engineers descaling both mechanically and with acids. The Nirex desalination plant was being descaled every two months to maintain sufficient quantities of fresh water. In addition, they had to frequently renew large amounts of the 2000 metres of ship's pipework, at a cost of £30 per metre.

It was also decided to install the **Scalewatcher-ENiGMA** onto the desalination plant's plate heat exchanger which is housed in a vacuum chamber and regularly scaled-up. This usually needed attention every 2 months, whilst cruising, in addition to a thorough mechanical and chemical descale during docking periods, which could take up to 10 days.

Eight months after the system

was installed, ETC received confirmation that the units were operating successfully on the fresh water systems. In addition, they were informed that the Nirex Fresh Water Generator had not required cleaning since the **Scalewatcher-ENiGMA** had been installed. The cruise line was so pleased with the results that it was decided to extend the treatment to cover all seawater services including the fresh water generators and cooling systems on main engines, shafts and electricity generators.

On one of the cruise liners, only the Alfa Laval Fresh Water Generator was treated, as ship's staff felt that it was not scale, but the growth of crustaceans inside the pipework of the sea water system that was causing greater problems.



Coincidentally, **Scalewatcher** had just produced a report on research carried out on the settlement of zebra mussels along the Welland Canal in Southern Ontario, Canada. The independent tests demonstrated that the **Scalewatcher** reduced the incidence of marine growth by up to 97%. A copy of this report was sent to the cruise line, which has resulted in ETC being asked to re-survey the ship

Twelve months after the **Scalewatcher-ENiGMA** Electronic Descaling systems were fitted, neither the desalination plant nor the fresh water systems on any of the ships have required cleaning. 📌



## McKay Securities chooses Environmental Treatment

Property investment and development company, McKay Securities PLC, has chosen the environmental route as the most cost effective way of treating the water system and air conditioning plants at its properties. To date, the company has installed **Scalewatcher-ENiGMA** scale control systems in 8 of its properties, which are primarily situated in the hard water area of Central Southern England.

The **Scalewatcher-ENiGMA** Electronic Descaling System was first installed at Chancery House, a 10-storey office block in Sutton, Surrey where despite the fitting of a water softening system, a build-up of scale on the chillers had affected the efficiency of the air conditioning system necessitating regular mechanical and acid cleaning.

McKay Securities heating contractors, Metro Heating, initially treated the **Scalewatcher-ENiGMA** with scepticism. However, within a matter of weeks, Michael Flannagan, Director, Metro Heating, noted that new scale was no longer forming and existing scale was being removed by the **Scalewatcher-ENiGMA** system.

He said: "Not only have we saved money on chemicals and expensive monitoring but also reduced the risk of legionella, as scale is a breeding ground for the legionella bacteria".

Michael Mobbs, group surveyor for McKay Securities, said: "We are now fitting **Scalewatcher-ENiGMA** units into all our new properties as a preventive measure, as well as retrofitting them in our older properties to remove existing scale in hot water systems and chillers. All the systems are functioning extremely well". 📌

# Lifting the Scale


One of the UK's leading seafood and frozen food companies has found another way of removing scale - not from fish but plate heat exchangers and pipework. Dedicated to taking an active approach to ensure best practice in environmental matters, the company sought a 'green' solution to the problems of scale build-up on its plate heat exchanger and calorifiers at its Grimsby factory.

Situated in one of the hardest water areas in the UK, with calcium levels of around 490ppm, the plate heat exchangers had to be stripped down and acid descaled every two to six weeks. The **Scalewatcher-ENiGMA** Electronic Descaling System was installed on a two-inch pipe feeding one of the three plate heat exchangers and was then regularly monitored to determine whether the technology could substantially extend cleaning times.

Four weeks after installing the system, the plate heat exchanger

was opened for inspection. It was immediately noticeable that the level of scaling was substantially less, and when the plates were tapped, a large amount of soft scale fell away. At the same time it was reported that factory floor workers and night cleaners had commented to the engineering department on

the increased levels of hot water.

The period between cleaning has more than doubled and in some cases it has been extended by 300%. In addition, scale in valves and pipework is now minimal with remaining scale being soft and easily removed. 


## It may be a *paradox* ...but it works



ETC has launched **ParaDox**, a technically advanced system specifically designed for the treatment of effluent. Three years in the development, **ParaDox**, uses special frequency modulated signals to both enhance polymer effectiveness and reduce fouling.

Following a number of successes using the existing patented technology to reduce costs in effluent treatment plant, it was discovered that the treated fluid often affected the performance of polymers, particularly when used for solids separation. ETC embarked on a series of laboratory and field tests in conjunction with a Process Scientist at Southern

Water, resulting in the discovery of the most effective output parameters.

The result is a *patent applied for* system that is capable of improving separation, coupled with improved filtrate/centrate. In addition it is possible to reduce polymer costs very significantly and prevent or reduce scaling. 

# Effluent Plant Goes Green

David S Smith Corrugated, part of David S Smith Packaging, has found an environmental way of resolving the scale build-up in its effluent plant by installing the **Scalewatcher-ENiGMA** scale control system. Not only has the company substantially improved the performance of its plant but has also received a payback on the system in just 7 months based on chemical savings alone.


Situated in the very hard water area of Newmarket in Cambridgeshire, the company manufactures around 2 million square metres of corrugated fibreboard a week. The board is sold to a wide range of end users including bakeries, pet food manufacturers and pharmaceutical companies.

As part of the process, the company produces around 25 cubic metres a day of effluent mix, comprising of wheat starch with a high pH value of 13 and print wash-down with a pH value of 4. Lime and ferric sulphate is added to the effluent mix at the treatment plant to flocculate the

solids from the liquids. The combined effluent cocktail with its high pH values, together with the high levels of calcium in the mains water, caused severe scaling in the effluent plant's pumps. This necessitated the company having to regularly strip them down to acid clean.

The **Scalewatcher-ENiGMA** system was rented for a three-month evaluation period in order that they could appraise its benefits and was installed throughout the effluent plant to cover the complete treatment process. The system was closely monitored for scale deposition and found to be completely scale free.

"We were delighted with the results", said Ian McLaren, Engineering Manager. "Not only have we reduced our chemical usage by between 25 to 30 per cent which is far better for the environment, but we have also substantially lowered our costs on chemical disposal, downtime and maintenance."

As an added bonus, the **Scalewatcher-ENiGMA** system has also removed the scale from the probes, which are used by the plant to automatically measure the pH balance. They now give a more accurate measurement, which has allowed the plant to have tighter tolerance levels. 

# Clear Solution to the Belfry

De Vere's internationally renowned hotel and championship golf course, The Belfry, has saved costs on maintenance, downtime and salt, and has also extended the life of capital equipment by replacing water softeners with the **Scalewatcher-ENiGMA** Descaling System providing them with a payback in less than 18 months.

Prior to the system being installed, the hotel used water-softening equipment to control scale build-up. Located on the roofs of the bedroom blocks, the softeners had to be regularly topped up with salt. This necessitated the hotel's maintenance engineer having to carry bags of salt through the hotel and up a ladder to the water softeners.

ETC's Managing Director, John Thompson, suggested that the hotel initially install a **Scalewatcher-ENiGMA** to one of the plant rooms, providing hot water to one of the bedroom blocks, to evaluate its effect. As part of the evaluation process, The Belfry's Maintenance Engineer cut out a section of pipework and replaced it with a piece of pipe that he could remove to assess the level of scale. Twelve

months later the pipe was removed for inspection and found to be completely clean.

Following the successful evaluation, the **Scalewatcher-ENiGMA** was expanded to treat the plant rooms providing hot water to the Floyd and Ballesteros bedroom blocks via the Apollo bedroom block. A fourth **Scalewatcher-ENiGMA** system was then installed in the Leisure Centre to prevent the scaling-up of the showers.

Grant Stanton, Maintenance Manager, stated: "We remove the section of pipe every 12 months to check it for scale, but have so far found it to be clear. The Belfry will continue to expand the system on new build projects and older water systems as and when appropriate". Such has been the success of the

**Scalewatcher-ENiGMA** system that Environmental Treatment Concepts has been asked to quote for extending the system to treat the Jacklin bedroom block, the Bel Air Nightclub as well as the Woodlands Conference Suite and Woodland Lodges.

Recommendation from The Belfry has resulted in ETC fitting systems in to the PGA (Professional Golfers Association)

headquarters, located within the grounds of The Belfry. In addition the company has treated all the water systems in The De Vere Belton Woods Golf & Country Club, near Grantham and two of the Group's new Village Hotel and Leisure Centres. These installations have additionally included swimming pools and Jacuzzis. Other hotels in the group have also shown interest. ■

## Scale Control for Water Tanks at Wadworth Brewery

Wadworth Brewery has installed the **Scalewatcher-ENiGMA** scale control system onto its hot water storage tank and mains cold water supply to the Brewery. The 300-barrel hot water storage tank, heats in excess of 3000 g/hr of water via external steam calorifiers, to a temperature of 80°C. The hot water is then fed to a ring-main system for use in draught beer production, cask and keg washing as well as a limited number of hot water outlets.

Limescale was deposited on the calorifiers and pumps as well as the storage heater, reducing efficiency and costing the company £1000 a year in extra fuel charges. Descaling necessitated plant shutdown for two days whilst acid cleaning was carried out.

The **Scalewatcher-ENiGMA** system was installed to treat before and after the pump on the recirculating pipeline, which includes a calorifier to heat the hot water in the storage tank. An inspection of the hot water storage

heater six months' later found that the cover, when lifted, had only soft calcium on the inside which could be easily wiped away. Instead of a thick covering of limescale on the inside of the tank, soft calcium fell off the walls to the floor with just a touch and was easily removed.

Following this successful application, a second unit was configured to treat both inlet water feed pipes to the storage tank as well as the ring main calorifier. A decision to purchase a third unit to treat the main cold water supply to the Brewery soon followed.

"I have calculated that the **Scalewatcher-ENiGMA** system has provided a pay back in just 18 months", says Robert Tyre, Chief Engineer, Wadworth Brewery. "We are now using less fuel and acid, have saved on labour costs and improved the lifespan of our pump. In addition the **Scalewatcher-ENiGMA** system has also removed hidden costs. These include reducing production losses and downtime due to blockages caused by the build-up of limescale". ■



## Scalewatcher defends its patent

**Scalewatcher** has once again been forced to take legal action to defend the **Scalewatcher** patent. Previous court action taken against companies infringing the patent has resulted in substantial compensation being awarded to the owners of the **Scalewatcher** patent. ■



# Providing a Solution for Wastewater Treatment Plant

Southern Water is celebrating finding a solution to the scaling up of its plate heat exchanger and condensers at the new state-of-the-art wastewater treatment works at Ford, West Sussex.

The company has worked closely with ETC to resolve the scale problem by installing a **Scalewatcher-ENiGMA** Descaling System. This has resulted in a dramatic reduction in time spent cleaning the plates from 12 hours a day to just six hours a month.



The plant's recycling process involves blending the different sludges to produce a homogenous mixture of water and solid material. Polymers are added to thicken the mixture and this is fed into one of three large digester tanks where it remains for up to 14 days. During this time a temperature of 35°C is maintained, allowing bacteria within the waste to break down organic matter to water, carbon dioxide and methane gas. The methane gas is stored on site in a gasholder. A proportion of the gas is used to provide the necessary heat to maintain the

temperature of the digestion process with the remainder being used to heat the dryer.

The second stage of digestion cools the material and feeds it into a centrifuge dewatering plant, which separates the solid material from the water and creates a "cake". The "cake" is fed into a huge drying machine, which heats the "cake" to temperatures of 90°C. This evaporates the remaining water to produce virtually odour-free, dry granules that are then sold as fertiliser to customers for £10 per tonne. This is a major financial saving for

Southern Water, which would have had to transport solids to landfill at massive cost.

Prior to the **Scalewatcher-ENiGMA** being installed, the plate heat exchangers were producing high differential pressures every 24 hours that necessitated the plates having to be individually descaled with jet washing and wire brushing. This procedure took 12 hours each and every day.

"We were initially sceptical", says Mark Day, Process Scientist. "However, the **Scalewatcher-ENiGMA** Electronic Descaling system has now been installed for two months and instead of having to shut down everyday for up to 12 hours we now just wash down the heat exchanger plates every couple of weeks which takes just 3 hours. In addition, we have seen a remarkable change in the condensers, which, during inspections, show that the existing scale is now getting soft and being removed from the sides."

Now that the **Scalewatcher-ENiGMA** is working efficiently, the dryer is able to operate a 24-7 system, which has enabled the Ford wastewater treatment site to expand throughput which will enable it to produce 7,500 tonnes of pellets a year, the maximum production for the plant.

"The thermal drying is a critical section in the recycling system and one that we cannot afford to shutdown", concludes Mark Day. "The **Scalewatcher-ENiGMA** Electronic Descaling System is working way beyond our expectations and will in the long term save us costs on preventative maintenance, labour and downtime".



## New Sales Support Manager

Wendy Willmott has been appointed as Sales Support Manager, returning to Environmental Treatment Concepts after a break of 7 years. Wendy brings to ETC a wealth of experience in sales support as well as an in-depth knowledge of the **Scalewatcher-ENiGMA** technology.

Previously, Wendy was Recruitment & Training Manager with Scottish & Southern Energy plc where she was responsible for recruitment for the company's call centre at its Portsmouth Customer Service Centre.

In her new role she will be responsible for developing new business from existing customers, direct marketing and sales administration.

Commenting, Wendy says: "I am delighted to be back with ETC and to be part of a management team that is at the forefront of this exciting technology which is now becoming an accepted means of treating hard water problems in industry and commerce".



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