



CLEAN AS NEW
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CASE STUDY

UPGRADER EQUIPMENT GETS THE SPA TREATMENT

Tanya Ristoff, Communications Manager, Shell Scotford

INTRODUCTION

At first glance, it looks like a big equipment soaker tub, but there is much more than meets the eye when it comes to Tech Sonic Services' ultrasonic wash technology.

Scotford Upgrader has enlisted the help of [Tech Sonic](#) during the 2010 Spring Turnaround to clean large and small Equipment like valves, heat exchangers and other heavy-duty components.

NEW TECHNOLOGY

As Tech Sonic's Chris Monnich describes, the concept is quite simple, yet highly effective.

"It basically starts with a giant tub filled with a base solution. The, depending on the type of equipment and degree of cleaning required, Tech Sonic customizes the chemistry to produce a solution that is effective for the type of contaminants present.

For example, some equipment has oil and dirt build-up, while others are laden with coke-like heavy hydrocarbon materials which are more difficult to remove.

The equipment is lowered into the solution bath to soak for up to four hours. What makes the bath effective is Tech Sonic's "advantage" – ultrasonic technology that uses high intensity sound waves to clean the equipment.

Sonic cleaning technology is not new – jewellers have been using it for decades to renew the sparkle of precious gems. However, Tech Sonic is the only company in the world using their patented process on heavy equipment.

The company prides itself on being able to [clean](#) almost anything from scaffolding to valves to major heat exchanger components.

USING ULTRASONIC CLEANING AT SHELL

Tech Sonic is currently doing work for several major players in the oil sands industry; however, the Scotford Upgrader is the first [Shell](#) operation worldwide to use the technology onsite to clean components during a turnaround.

Scotford Reliability Engineer [Rafael Carias](#) said that while Scotford is trying on the technology for now, the benefits clearly make it worthwhile considering for future use.



Scotford Upgrader puts ultrasonic cleaning technology to the test with both large and small equipment. Pictured here – an exchanger bundle is lowered into an ultrasonic bath by crane.

“The way we would normally clean this equipment is using high-pressure water jetting, which takes much longer, uses a lot of water and also carries a higher HSE exposure risk because it is a hazardous activity performed by workers,” Carias explained.

“The Tech Sonic approach allows us to significantly reduce the amount of high-pressure water jetting we are doing, which means fewer personnel at risk, reduced water usage Scotford Upgrader puts ultrasonic cleaning technology to the test with both large and small equipment. Pictured here – an exchanger bundle is lowered into an ultrasonic bath by crane.

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“The Tech Sonic approach allows us to significantly reduce the amount of high-pressure water jetting we are doing, which means fewer personnel at risk, reduced water usage and overall less time spent cleaning equipment, which will help us get things completed more efficiently”.

“Tech Sonic can actually eliminate the need to dismantle components for cleaning because the solution, combined with the ultrasonic waves gets at hard-to-reach areas that would otherwise not be accessible unless you took things apart,” Monnich said.

There may be significant waste reduction and cost benefits as well. The Tech Sonic process often cleans components to the point of being inspection-ready, requiring only a low-pressure rinse and no HPWJ at all.

And, some equipment components that have been typically too costly to clean in the past can now

be salvaged and reused because the cleaning process is much more efficient and cost-effective.

"Even the cleaning solution itself is reused continuously, which ultimately results in less waste," Monnich explained.

Carias said that while the process is still new for the site and there is much to be learned, the results to date look very promising.



Like New! An exchanger bundle cleaned earlier in the week came out looking new after a soak in Tech Sonic's ultrasonic equipment bath.

"So far this technology is meeting most of our expectations," he said. "If things continue to progress well, we are planning for future long-term use on site as part of our ongoing maintenance processes."

RESULTS OF THE 2010 TURNAROUND

The primary benefit of using the Tech Sonic cleaning method is mitigation of risk when compared to conventional high-pressure water wash, bulk cleaning of components, reduction of wash water and elimination of over-spray. There is a time management benefit at the offsite service shops to dismantle and prepare components for repair/overhaul.

We had expected to use >10 million liters of water to clean components with high-pressure water wash equipment. The actual water usage was reduced to a small fraction of that estimate, resulting in cost saving to produce or purchase/transport the clean water and dispose of the waste effluents.

Summary of components cleaned using Tech Sonic - 650 control/relief valves, 32 check valves, 44 exchanger bundles, several hand valves, pipe spools, hose assemblies and other non-specific items.

The internals of four labyrinth mixers were successfully cleaned, which are typically difficult, if not almost impossible to clean using conventional high-pressure water wash.

We found that in all cases, the ultrasonic process, when combined with low-pressure rinsing and HPWJ produced significantly faster and better results than the traditional HPWJ methods alone.

The reduction in wastewater generation alone more than compensated for any additional cost of including the ultrasonic cleaning, and in fact made the overall cost of the TA with respect to cleaning activities less than half of a typical, similarly sized event using HPWJ only.

UPDATE 2020

[Scotford Upgrader](#) has now been using Tech Sonic technology onsite, continuously, 7 days a week for 10 years to clean valves, filters and other parts, and is now sending exchanger bundles to [ACDEN Tech Sonic's](#) offsite facility in Edmonton for fast and effective cleaning.

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Clean As New - Offsite Cleaning Facilities

1303 Thompson Park Drive
Baytown, Texas 77521 USA
T: +1.832.271.2666
E: info@cleanasnew.com
U: <https://cleanasnew.com>