

CONCO SYSTEMS

IN THE TUBE

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Condenser Tube Fouling and Failure Reduction

By Eric H. Fayard,
Marketing Manager, Conco Systems

Condenser tube events can have a significant impact on unit outages. In a recent Electric Power Research Institute (EPRI) survey, power generators were asked "what are your most serious cycle chemistry problems" and the number one answer was condenser tube leaks. According to Jim Mathews of EPRI, condenser tube failures in 1998 cost US generating companies \$360 million dollars while deposits in boilers and turbines cost an additional \$150 million dollars.

To further sober you on the impact of condenser tube fouling and failure, the North American Electric Reliability Corporation (NERC) has revealed that condensers were responsible for 25,955 forced and scheduled outages and deratings during a recent four year period, costing utilities 53,869 GWh with condenser tube leaks being the primary source of generation loss.

As a result of these condenser tube related issues, many generating stations have launched programs aimed at reducing condenser tube fouling and failure (CTFF). A recent presentation by Andy Howell of Xcel Energy at the 2008 EPRI condenser technology conference highlighted the need for an effective CTFF team and explained that "particular emphasis at Xcel Energy has been aimed at having all condenser tubes subjected to eddy current testing, both to prevent leaks during unit operation and to also evaluate the overall tube status with regard to retubing plans." Andy explained that benefits of their CTFF program are expected to be long-term, but they have already realized improvements during the first two years of their program.

Condenser tube fouling is one of the

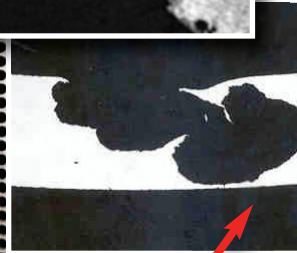
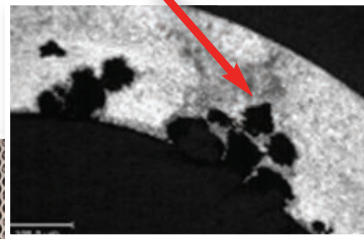
most common catalysts for tube wall erosion/corrosion. Microbiologically influenced corrosion prevalence has been on the rise and operators have begun seeking assistance in tube cleaning not only for performance but also for prevention of under-deposit corrosion. It is now widely understood that keeping condenser tubes clean not only boosts output but dramatically extends the lifespan of the unit.

Tube fouling can range from bio-films to zebra mussels and manganese to calcium carbonate, each with unique challenges to effective cleaning. The real challenge generators face is selecting the right type of tube cleaning for their site specific conditions. Once condenser tubes are free from fouling deposits, a systematic multi-frequency eddy current inspection should be performed for the prevention of tube leaks. It should be noted that reliable eddy current inspections are highly dependent on tube cleanliness. Achieving a fill factor in the 85-90%

range is optimal and finding a contractor that can provide cleaning and testing is not only efficient, but cost effective.

Conco Systems can be a key component of your condenser tube fouling and failure program. Since 1923, Conco has cleaned over 100 million condenser tubes and has integrated eddy current testing and tracer gas leak detection services to enhance performance and reliability for our customers. Conco can also provide expert condenser performance assessments, tube failure analysis and full tube deposit analysis. For a no-nonsense evaluation of your condenser tube fouling and failure prevention goals, call Conco today at 1-800-345-3476.

Tube wall cross section reveals deep pits.



Imminent failure caught in time with ECT.



Conco NDE Technician Using MIZ28 Multi-Frequency Analyzer.

Tube Images Courtesy Andy Howell, Xcel Energy and Nathan Muthu, EPRI

Newly Designed Catalog for 2009

Conco's Power Industry Catalog for 2009 is now available.

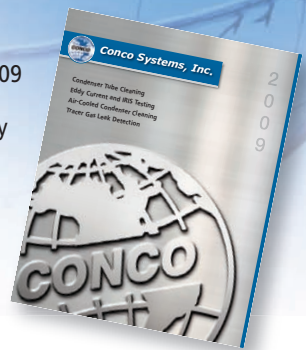
Sporting a new, fully illustrated format, the catalog features Conco Systems' extensive variety of services and products for power generating and industrial plants dependent on clean, efficient condenser and heat exchanger tubes for optimum productivity.

Beginning with a review of Conco's fast, effective tube cleaning services, this section includes tube clean, plugging and pulling services, as well as retubing and a case study of calcium scale removal at a nuclear power plant. Following sections address Conco's Leak Detection Services, with emphasis on Tracer Gas Leak Detection, for which Conco is an industry pioneer, Air-Cooled Condenser Cleaning, featuring Conco's FinTechSM ACC Services and Conco's Eddy Current Testing Services.

A new section in this catalog focuses on Conco's Industrial Services, which, in addition to Tube Cleaning and HydroDrilling, highlights Conco's new NitroLanceSM Liquid Nitrogen Cleaning Service. This section is followed by a review of Conco's various tube and deposit analyses Support Services.

The new catalog concludes with a comprehensive review of Conco's extensive array of products and equipment, including Tube Plugs, Alkaserts, Polyethylene Inserts, the Conco Two-Gun Tube Shooting System and the wide range of Conco Tube Cleaners that have been engineered with configurations designed to effectively solve any tube fouling problem.

For a copy of the new catalog, contact Conco Systems at 1-800-345-3476 or visit www.concosystems.com.



Conco Systems Displays, Presents, at Conferences

The 2008 ASME Power conference was held July 22-24 at the Disney Contemporary Resort Convention Center in Orlando Florida where Conco was on display. In addition to the Conco booth, Marketing Manager Eric Fayard presented his paper titled "Case Studies: Plant Performance Improvements Through The use Of Innovative Condenser Cleaning Technology and Leak Detection



Inspection." The paper focused on the various mechanisms of tube surface fouling, advances in tube cleaning, and tracer gas leak inspection for the isolation of both air and circulating water inleakage.



Additionally, St. Petersburg Florida played host to the Electric Power Research Institute (EPRI) Condenser Technology Seminar and Conference where Conco had an informative display. President of Marketing George

Saxon, Jr., as well as Marketing Manager Eric Fayard, presented three technical papers at the conference highlighting eddy current testing, calcium carbonate scale removal and advances in tracer gas leak detection. If you would like a copy of any the technical papers presented at 2008 conferences by Conco please write, email or call us.

Showtime for Conco

■ PowerGen International
Orlando, Florida
December 2-4, 2008
Booth 4407

■ Cooling Tower Institute
Annual Conference
San Antonio, Texas
February 8-12, 2009

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ADDRESS SERVICE REQUESTED

This is Conco

■ Established in 1923

■ Recognized worldwide for "Absolutely the Best"

- Condenser Tube Cleaners
- Tube Cleaning Services
- Air Cooled Condenser Cleaning
- Tracer Gas Leak Detection
- Eddy Current Testing
- Support Services

■ Manufacturer of a wide variety of state-of-the-art equipment that includes tube cleaners, tube cleaning systems, hydrodrills, air-cooled condenser cleaning services and testing instruments engineered to keep you productive and efficient

■ Headquartered in the United States, with offices and representatives throughout the world:

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Conco Cleaners Foil Shellfish in Philippines

The AES Masinloc Power Station is a 600MW base-load pulverized coal-fired power plant located in the municipality of Masinloc, Province of Zambales, north of Manila, Philippines. Power generated at this plant is delivered at the plant's 230 kV switchyard connected to the transmission system of the National Transmission Company. Seawater from Oyon Bay, north of the plant, is used for cooling.

PROBLEM: The plant's chlorine dosing system went down, resulting in the introduction of shellfish into the cooling system. The buildup of shellfish affected the performance of both the condenser as well as four auxiliary heat exchangers. Time restrictions permitted only a quick shutdown, allowing for the cleaning of the condenser with a plan to clean the auxiliary units independently.

SOLUTION: Responding quickly and in coordination with Conco Systems Pty. Ltd., Conco's production department shipped the appropriate Conco tube cleaners to our distributor, Powerhaus Industrial Sales and Service in the Philippines, allowing them to quickly meet the power station's need to clean the tubes within the



Worker loads Conco Tube Cleaners into tubeshield at Masinloc Power Station.

restrictive timeframe. The condenser unit was returned to service quickly, enabling the plant to meet power needs, with the auxiliary heat exchangers being taken out of service one at a time for further

cleaning. Shells were efficiently removed from 10,970 condenser tubes and 4,320 tubes in the auxiliary units. Masinloc intends to incorporate Conco cleaning during future outages.

From the Mailbag

Platte River Power Authority
Rawhide Energy Station
Wellington, CO 80549

Subject: Conco Leak Detection Services

Dear Conco;

Recently, I had the pleasure of having Conco Systems provide air-ingress leak detection services at our facility.

My biggest compliment was how Conco worked with me on short notice to get your technicians to our site. We were four days from our major outage and wanted to ensure that we located the source of a sudden increase of air inleakage so it could be addressed during the outage.

Your technicians were EXACTLY on time, got right to work, and found a major leak in our expansion joint as well as four or five other leaks, all of which could now be addressed during the planned outage.

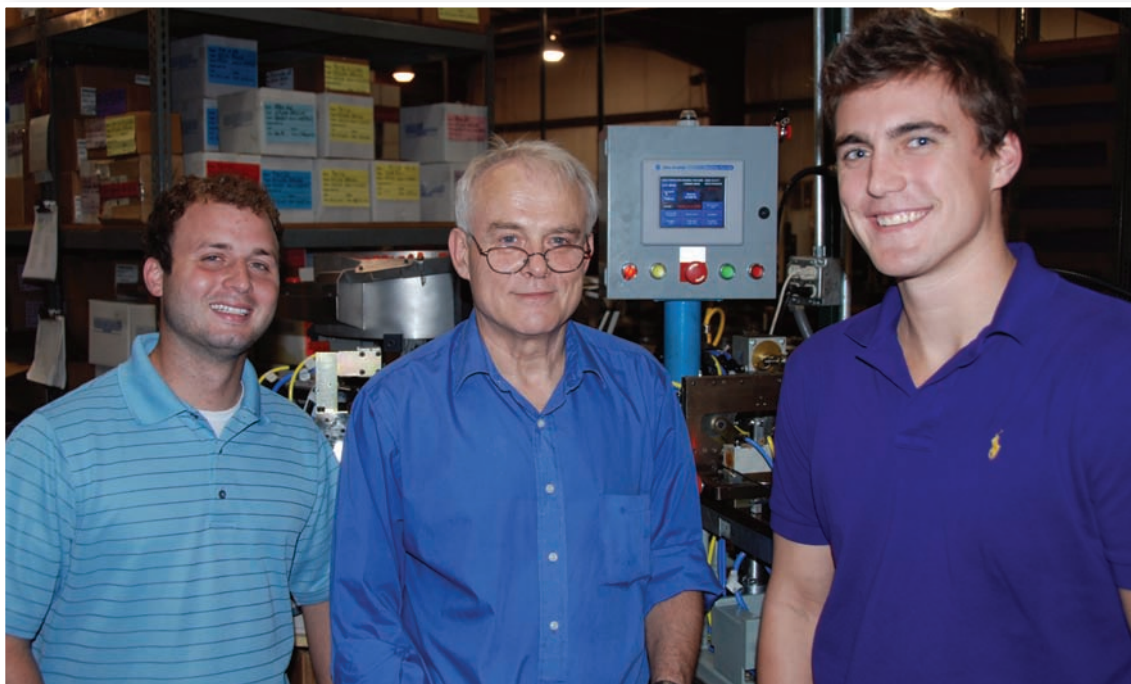
This is the second time I have used Conco Leak Detection – earlier this year, your technicians uncovered a condenser tube leak that we had been chasing for several weeks!

Thanks Again,

Doug Adair
Maintenance Manager
Platte River Power – Rawhide Energy Station

Conco Systems recently received this letter from Mr. Doug Adair, Maintenance Manager, Platte River Power - Rawhide Energy Station in Wellington, Colorado. Mr. Adair complimented Conco's Leak Detection crew on their timely response and success concerning a major leak at his facility.

Thank you, Mr. Adair.
We appreciate your comments.



Engineering Group (L-R) Gregory Savinda, Michael Toth, Zack Godish.

"Engineered by Conco"

Extraordinary attention to detail, material and build quality are just a few reasons why Conco tube cleaners are considered the gold standard in offline mechanical tube cleaning.

Behind every Conco tube cleaner are thousands of man hours of research and development that begin with the same basic philosophy, "better engineering yields better results." Conco chief mechanical engineer, Michael Toth along with Engineers Greg Savinda and Zack Godish work in concert to develop new product designs and enhanced delivery of Conco field services.

Conco engineers are mainly driven by condenser and heat

exchanger cleaning application challenges presented by the industry. Product developments such as the Calbuster, Stainless Steel Twist Brush, Hex Cleaner, U-tube Cleaner and others have all been developed to resolve specific heat transfer issues related to specific problem deposits where suitable solutions did not exist.

Call your Conco sales representative and learn why "engineered by Conco" means consistent and reliable tube cleaning products and services, which yield higher levels of efficiency and plant availability than any other method.