

AN AUSTRALIAN METALS REFINERY INCREASES CAPACITY, AND IMPROVES EFFICIENCY VIA THE DEPLOYMENT OF A CUTTING EDGE COOLING TOWER FILTRATION SYSTEM.



The Yabulu industrial metals refinery in the Australian State of Queensland currently produces in excess of 30,000 tons of nickel and nearly 2000 tons of cobalt annually. The facility went on-line in the mid-1970s, following the completion of a rail line linking Yabulu to a Queensland mining operation near the town of Greenvale. The mine provided the refinery with nickel laterite ore until shortly after its closure in 1992. Since then, Yabulu has sourced supply beyond Australia's borders from mining operations in Indonesia, The Philippines, and New Caledonia. The facility is administered by QNI Nickel (WA) PTY Ltd, whose parent company, BHP Billiton, is a global player in the exploration, production and marketing of high quality nickel and cobalt.

In 2005, an expansion was launched on Yabulus's back end plant to increase its refining capacity. A new main building was added, and with it, a steam generator and several smaller structures. A new cooling tower was built as well, in order to cope with the additional heat loadings created by the project. Hatch Consulting Group based in Brisbane first approached Sonitec for their side stream filtration need and started working with Sonitec's Australian representative. The tower was soon fitted with a Vortisand® filtration system to maintain high water quality so that the cooling tower was running at a high efficiency, this was achieved by reducing the TSS and in turn reducing the chemical loading needed to maintain the system.

"Suspended solids can leave accumulations of slime and other materials on cooling tower blades, cutting back on the tower's ability to function effectively" explains Steve Pettit,



Vortisand® Product Manager, Standard Products Division, Aquatec-Maxcon, Pty. Ltd., a broad-based water services provider headquartered in Ipswich Queensland, "Since cooling tower efficiency reduction will have the opposite effect on running and maintenance costs, the plant fitted the tower with Vortisand® rapid sand filtration as preventative medicine."

The filter was installed as a side stream system, Steve Pettit adds, and since installation, suspended solids have been no problem. Vortisand® deployment also made it possible for the plant to cut back on the expensive chemicals needed for water quality maintenance, and with them the handling and storage space required for safe stowage. Chemicals are a necessary adjunct to cooling water as they inhibit corrosion, disperse sludge, control pH levels and retard the growth of algae. Good filtering will not supplant the need for cooling water chemistry, only the need to use it in copious quantities.

A Good Fit

Vortisand® deployment has paid off in a number of ways, according to Aquatec Maxcon Standards Products Division Manager, Ron Howick.

"The system has actually reduced the plant's cooling tower water use," he says. "As such, it's a good fit for BHP Billiton, whose pursuit of excellence is driven by the use of the very latest and best-available technology and equipment. The Vortisand® sand filter is also virtually, maintenance-free, and this is borne out by the fact that post-installation, the refinery hasn't made a single breakdown call to service the unit."

Suspended solids disappear as well, Howick adds, increasing cooling tower efficiency and trimming the cost of plant operation overall. Vortisand's talent to slim solids was demonstrated by water quality tests carried out on the 22nd of September, 2008. The tests showed a



solid level of 34 PPM, pre-deployment, but a level of only 9 PPM since the system was brought on board. Moreover, this huge reduction correlated an equally significant cutback in chemistry use.

Let's Just Say It Works!

"It's hard to actually number the savings that have been made, as the Vortisand® was installed along with the new cooling tower and has been operational since the beginning," says Yabulu Refinery Technical Superintendent, Jennifer McCulloch. "The system has been operational for roughly 18 months for the purpose of reducing suspended solids, scaling and water fouling. We did some testing, and determined that the Vortisand® did indeed cut back on solids. So it's fair to say the system is doing its job."

Vortisand is the Cadillac of the product fleet of Sonitec Inc., a Montreal-based, global solutions provider for water cooling, heating

process and quality enhancement. The system isolates and exiles suspended solids via an ingenious process combining centrifugal force and automatic backwash.

This motion-driven operational concept is revolutionary, and side-by-side with conventional filters, a lot more effective. Many sand filters fall flat because they rely on large grains for particle capture. As such, they miss the small stuff easily snagged by Vortisand's nearly microscopic filtering media, a mix fine enough to seize particles as small as 0.45 microns. Static systems are also programmed for malfunction in that they must employ oversized media since the use of finer material risks choking the system. Most conventional systems lack Vortisand® brain power as well, the ability to self-monitor and self-flush at the point when particle accumulations threaten water quality.

These virtues have not been lost on BHP Billiton, who according to Pettit is so impressed with the system's performance that



it is now considering a Vortisand® retrofit for Yabulu's original pair of cooling towers. The organizational phase of a full-scale pilot plant is currently underway to test the system's effectiveness on the two towers. The plant is slated for completion by the end of this year.

"Since the expansion and the cooling tower went up together it's difficult to pinpoint the dividends its paid the refinery so far," he points out. "I can say, however, that the dosage of chemistry needed to keep water quality levels up for the new tower is much less than it is the two older ones. And that, coupled with the filter's little-or-no maintenance requirement, enhances the system as a whole and helps it function much more effectively."



For more information on the Vortisand® filters contact Sonitec at:
1-888-876-9655
or visit the website: www.sonitec.com



CANADIAN INTERNATIONAL OFFICE
4020 Bois-Franc, St-Laurent, Quebec, Canada H4S 1A7
Tel: +1 (514) 335-2200 Fax: (514) 335-2295