

Quality conversion down under



To future-proof its markets, Pan Pac of New Zealand decided to convert a large part of its standard TMP production to BCTMP. It chose ANDRITZ to design, deliver, and install the new line – which today has one of the largest two-stage peroxide bleach plants in the world.

Two tectonic plates meet underneath New Zealand. From time to time these plates move. Earthquakes don't happen often, but Kiwis (as New Zealand's residents are called) have adapted to the threat of them. It is a small price to pay for the pleasures of living in this exquisite country.

The city of Napier, on the east coast of the North Island, is famous for its Art Deco architecture. Napier was rebuilt after an earthquake in 1931 when Art Deco was the fashion.

Blame the internet

Pan Pac is a timber and pulp mill about 15 km from Napier. It is owned by Oji Paper of Japan. Pan Pac's production includes solid lumber, wood chips, and 720 t/d of mechanical pulp which has been feeding Oji's newsprint machines in Japan since 1973. The fiber source is primarily long fiber (*Pinus Radiata*), sustainably managed in accordance with FSC certification.

Tony Clifford, Pan Pac's General Manager, Pulp Division, explains, "Basically we were contract manufacturing for Oji in Japan. We had two ships dedicated to moving TMP to Japan doing a roundtrip each month."

But Pan Pac and Oji realized that straight TMP production was not the direction for the future. The rise of the internet and the slow demise of newspapers and Japanese comic-style graphic novels signaled the decline of standard newsprint. Oji has a long-term view and was willing to invest substantially in an upgrade to BCTMP (Bleached Chemi-Thermo Mechanical Pulp) to help future-proof the mill's production and its markets with improved pulp for higher value-added paper grades.

"Recognizing there would be a decline in the demand for newsprint grade pulp, we started planning for this change," says Clifford. "Although the demand for TMP has not declined at the speed we forecast, we need alternatives such as BCTMP."

In December 2010, the Board approved a project to convert roughly two-thirds of the

TMP pulp to high-grade BCTMP. The project included a two-stage alkaline peroxide bleaching facility from ANDRITZ and a new effluent plant with two stages of biological treatment.

Accommodating design

As with other countries in the Pacific Rim, industrial design and construction in New Zealand must take into account staunch seismic building codes, according to Bruce Ayling, Pan Pac's Manager of Engineering and Development. "For example, any tower or large tank is designed to withstand horizontal forces," he says. "This is to reduce the potential for a tower tipping over if the earth moves underneath it, or a tank rupturing because of unexpected horizontal pressures."

Designing and installing bleach plants is part of ANDRITZ's usual business, but this project was noteworthy because it was going to be the largest two-stage peroxide bleaching line for long fiber, and because it was an upgrade to an existing plant where there were extremely challenging space

limitations. Accommodating the seismic design considerations was also part of the challenge.

"ANDRITZ knew there would be stringent design requirements when the contract was negotiated, but probably did not know how difficult the design was going to be," Ayling, who managed the project for Pan Pac, says. "But their team quickly got their heads around the seismic code complexities and came up with effective solutions. We are very happy with the result."

A local engineering company, LHT Design, worked closely with ANDRITZ. Of special note are the two bleach towers – 25 m high and weighing 650 tonnes each when full. Pan Pac made a colossal underground concrete and reinforced steel raft for the tanks to stand on. ANDRITZ designed a steel cradle on four legs to hold the tanks in place. The legs were each bolted to the concrete raft with eight huge bolts (2 m long and 90 mm in diameter), strong enough to withstand horizontal pressures and long enough to provide some flexibility.

ANDRITZ designed a steel cradle on four legs to hold the bleach tanks in place in case of a seismic event. ▶



Big things in small spaces

The bleach plant includes a two-stage peroxide system (medium consistency and high consistency) which provides high brightness with low chemical consumption. Included in the scope was a screen room (including reject refining), extraction washing stages, and a chemical farm located alongside the mill. The delivery was performed turnkey by ANDRITZ.

According to Josef Liendl, Sales Manager for ANDRITZ, there are several key products in the line. One of note for its uniqueness is the HC Mixer, which helps to achieve very high brightness with low chemical consumption. "The mixer fluffs the pulp to create more surface area without impacting strength or other pulp characteristics," Liendl says, "creating an ideal environment for thorough, intimate mixing."

Pan Pac wanted their new plant to be located within an existing building as much as possible. Equipment that would not fit in the building was to be close by and compact. Ayling explains, "We wanted to keep everything compact so our people can quickly and efficiently get to all parts of the mill from the control room. This also helped



“Our new BCTMP is a super product of value to our markets. Demand is exceeding our ability to supply.”

Doug Ducker
Managing Director
Pan Pac

us minimize piping and cable runs to keep our costs down."

Pan Pac prepared 3D layouts to evaluate clearances and space requirements. They worked collaboratively with ANDRITZ to make sure that equipment could be installed within the space limitations.

"ANDRITZ was receptive and obliging and provided good support to ensure the process was kept as simple as possible within the space constraints," Ayling says.

Keeping it running

Construction began in January 2011. The installation job was intense and involved a number of different activities that needed to be spliced together. To add to the challenge, the existing pulp mill remained operational.

"The existing TMP plant was in production right through the construction period," says Ayling. "There was less than a week of total downtime to perform all the tie-ins and changeovers."

According to Ayling, organizing the logistics of this was challenging, with people and product coming from Austria, China, and Japan – as well as a large contingent of specialist local tradesmen.

"On any large engineering job, little things that had not been anticipated create challenges," says Maurice Garvie, ANDRITZ Project Director. "We had our challenges, but there was an excellent spirit of cooperation. It is really a tribute to the people at Pan Pac. They created a work environment where cooperation and fairness came first, which was a sound basis for addressing each challenge as it appeared during the project."

▲ Six new ANDRITZ pulp screw presses are key to achieving the proper consistencies for bleaching and washing.

The unique HC Mixer helps to achieve very high brightness with low chemical consumption. ▼



▲ The team, left to right: Bruce Ayling, Manager of Engineering and Development, Pan Pac; Koji Aoyama, Technical Director, Pan Pac; Doug Ducker, Managing Director, Pan Pac; Josef Liendl, ANDRITZ Sales Manager; Tony Clifford, General Manager Pulp, Pan Pac; Danny Eagleton, Projects & Development Pulp, Pan Pac

Ayling says, "There was total commitment to solve problems. The ANDRITZ team was great to work with. There was a lot of pressure, but we also enjoyed it."

At times there were several ANDRITZ people with different areas of expertise at the mill. It did not appear to be difficult to get people to head "down under," especially during the Austrian winter. Napier, besides being quaintly Art Deco, is also famous for its wine, sun, sailing, and fresh Southern Ocean seafood.

A new market

The BCTMP plant was running by April 2012. According to Clifford, "At present, we are producing to demand – 160,000 tonnes BCTMP and 120,000 tonnes TMP annually. We have flexibility to change the production ratios between TMP and BCTMP according to market demand."

Since BCTMP is a higher quality and bright pulp, it can be used to make fine white cartonboard for packaging and is also food safe. "Food-grade board must be 100% virgin fiber, which ours is, so there is a good match there," says Clifford.

"Our objective has been to convert logs from sustainable forests into wood products and fiber utilizing New Zealand resources – electricity, technology, and the skills of our people," says Doug Ducker, Managing Director. "Initially our products were used solely in Japan, but now they are being used on a more global level. We have one of the world's largest market mechanical pulp mills in the world at a capacity of around 280,000 t/a. Our new BCTMP is a super product of value to our markets. Demand is exceeding our ability to supply."

The TMP still goes to Oji mills in Japan, but the BCTMP is sold on the open market. About 80% is exported to China, with the balance to Indonesia. As Clifford says, "Our investment to produce BCTMP gives Pan Pac access to new markets, establishes a new direction for us, and is the source of new vitality. And we increased pulp sales by 50,000 tonnes last year. We can sell every tonne of pulp that we produce."

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For the sake of good cooperation

On April 11, 2014, a magnificent ceremony to celebrate the expanded pulp business was held at Pan Pac's facilities in New Zealand. Mr. Shinoda, Chairman of Oji Holdings, and Mr. Yajima, President of Forest Resources and Environment Marketing Company and the Chairman of Pan Pac, were in attendance.

In his speech, Mr. Shinoda highlighted the close relationship between Oji and Pan Pac, the background for the investment in BCTMP production, and a commitment to further business expansion in New Zealand.

Steven Joyce, New Zealand's Minister for Economic Development, acknowledged Pan Pac's contribution to the development of the country as a bridge between Japan and New Zealand.

A collaborative opening of a sake barrel – one of the highlights of the celebration – was an excellent expression of the cross-cultural relationship between the companies and countries.



▲ Sake barrel opening, left to right: Doug Ducker, Managing Director, Pan Pac; Steven Joyce, NZ Minister for Economic Development; Craig Foss, NZ Minister of Commerce; Yasuaki Nogawa, Japanese Ambassador to New Zealand; Shinoda, Chairman of Oji Holdings