



December is always a hectic month and for Dobbie Engineers it also included the regular external audits of our ISO 9001 System and OSH Pressure Piping Design Verification work.

Both our offices had busy years with our Auckland office increasing its client base. About 30% of Auckland's work is with new clients in the area from Morrinsville to Kaitaia. Our Auckland clients appreciate the rapid response available from a local office.

You may have noticed our new logo which is more distinctive and emphasizes our specialist discipline as mechanical engineers.

ISO 9001

Dobbie Engineers objective is to provide effective engineering solutions. Our ISO 9001 quality accredited system concentrates on these objectives:

- Your objectives and constraints are understood.
- Both obvious and novel options are considered.
- Detailed design and documents are accurate.
- Contracts are administered fairly.

Our interaction with you in terms of correspondence, meetings and understanding deadlines is very important to us. We want to ensure all our staff relate effectively with your team.

Compliance to procedures is a key objective of the quality assurance review by the external auditor. The auditor noted that our overall performance was excellent.

NORSKE SKOG TASMAN TA3 TURBINE REPLACEMENT

During 2004, Chris Macindoe and our Rotorua office were involved with the replacement of the TA3 geothermal steam turbine. Several options were worked through with Tasman. The final selection was an Elliott supplied turbine. Since the introduction of the Pressure Equipment, Cranes and Passenger Ropeways



Regulations in 1999, importing pressure equipment into New Zealand has become more difficult. Chris Macindoe and Jim Dobbie assisted with the turbine purchasing and the analysis required for New Zealand conditions. The new turbine was situated on the existing foundation block which required extensive use of our AutoPLANT 3D model to ensure accurate co-ordination. Dobbie Engineers produced approximately 60 mechanical drawings for the installation. The turbine was successfully commissioned in November, its performance exceeded Norske Skog Tasman's target output.

MECHATRONICS

Equipment is often monitored and controlled by sophisticated instruments and control systems. The University Engineering Schools have identified this increasing area of work and now provide a Mechatronics degree. It is a blend of mechanical, electrical and computer systems engineering.

The first of these Mechatronics graduates completed their studies in 2004. Dobbie Engineers has employed Greg Dingle from the University of Auckland School of Engineering. Greg joins our Rotorua office in January 2005.

AUTOPLANT

Since Dobbie Engineers' significant investment in AutoPLANT 3D design package, several large projects have been designed and implemented with this software. These projects are the Kinleith PM6 broke pulper, Fonterra Reporoa Ethanol plant upgrade and the Norske Skog Tasman TA3 geothermal turbine replacement. The 3D model allows accurate visualisation and coordination of the installation. AutoPLANT integrates with AutoPIPE pipe stress analysis software, and produces piping isometrics with automatic bills of materials.

PVE5 SOFTWARE

This year we purchased the pressure vessel design software PVE5. This is the same software that SGS M&I use to design verify pressure vessels and therefore we are now able to achieve design verification much quicker. The software allows us to rapidly try various design options and plate thicknesses to ensure safe and economical pressure vessels.

CHATEAU 39 ROOMS EXTENSION

The Bayview Chateau Tongariro, located in a World Heritage Park at the foot of Mount Ruapehu, was first completed in 1929. This year the Chateau's owners committed to a 39 room extension. Dobbie Engineers designed and monitored construction of the heating, ventilation, soil and waste and domestic water systems. Because of the harsh climates associated with the location of the Chateau, the 39 rooms were built individually in Auckland and the modules were freighted to Mt Ruapehu.

CARTER HOLT HARVEY PM6 REEL BROKE PULPER

This year Michael Lee and our Rotorua office undertook the detailed design, construction and project management for the new PM6 Reel Broke pulper with a project value of \$2.2M. This equipment recovers the rejected reel broke and returns it to the paper machine base ply system. The repulper required excavation of a 9m x 8m x 4.5m deep hole to accommodate the tub and drive unit.



The installation was commissioned in August following an 8 month design and construction period. Trials have shown the pulper exceeds the original design specifications and can process in excess of the 300t/day required.

PRESSURE EQUIPMENT AND CRANES

Equipment owners and operators have legal obligations for the safe use of pressure vessels, pressure pipes and cranes. In 1999 regulations were passed into law that defined these requirements. Pressure equipment now includes pipes and vessels containing steam that is at atmospheric pressure or higher and at 100°C or hotter. This has caught many vessels that were previously considered exempt.

Our mechanical engineers have carried out several projects this year to evaluate such vessels and determine for the owners if they are complying with the safety requirements.

FONTERRA REPOROA ETHANOL UPGRADE

Dobbie Engineers analysis of a corroded distillation column resulted in Fonterra's decision to replace the front end of the Reporoa Ethanol plant with a new distillation column. Dobbie Engineers were engaged to design the pressure vessels and piping associated with this project. Chris Macindoe from the Rotorua office ran the project for Dobbie Engineers with

Steve Holm from the Auckland office designing the pressure vessels. The largest vessel was 2.3m diameter by 28m tall weighing 28 tonnes. The space available for plant and piping was limited so extensive use of AutoPLANT 3D software was made.



NEW ACCOR IBIS HOTEL

Accor has added yet another hotel to its portfolio. The new 145 room Rotorua Ibis Hotel built by R&B Construction stands on the shores of Lake Rotorua. Dobbie Engineers provided detailed design and construction monitoring for the mechanical and hydraulic services. We congratulate Accor and R&B Construction on their addition to Rotorua's tourist industry.

GEOHERMAL ENERGY PLANT

Our largest geothermal project this year was the geothermal steam turbine replacement at the Tasman pulp and paper mill. There have been a number of other geothermal projects that were initiated by rising natural gas prices and concern about carbon dioxide emissions.

Geothermal energy is considered a renewable energy resource. It also has low carbon dioxide emissions compared to fossil fuels. CO₂ emissions are less than 2% of a similar sized coal station.

Dobbie Engineers have been involved in studies and the design of geothermal plants that provide alternative energy options for Tenon's sawmill and Laminex's fibreboard plants at Taupo. Both geothermal plants are direct heat applications and are cost effective alternatives to natural gas.

STAFF ACTIVITIES

During 2004 three new staff joined our Rotorua office they are Jeff Carter, Kirsteen Lowe and Emma Fox. Also Peter Meek, a graduate engineer was employed by our Auckland office.

Biking remains a popular activity for our staff. A team was entered in the Taupo day night thriller and Jeff Carter (Mech Eng) has designed and built the 4X track for the world championships.

Dobbie Engineers Ltd. Consulting Mechanical Engineers