FANTECH

TECH TALK

Newsletter Number 71

August 2011

New Ice Rink for Melbourne

Melbournians have the opportunity to skate to the top of winter sports with a new world-class ice sports facility developed by ING Real Estate in Docklands.

Medibank Icehouse is the only dual-rink facility in Australia and features two Olympic size ice rinks to cater for ice sports - figure skating, short track speed skating, ice hockey and curling - as well as recreational skaters. Grandstand seating for 1,000 spectators, a café, bar, gymnasium and specialist sports medicine clinic make this a world class training and competition facility and are key reasons why the Olympic Winter Institute of Australia (OWIA) relocated its training programs and administration to the Icehouse.

> **"... the first professional ice-skating rink to be built in Melbourne..."**

Entire Mechanical Services won the mechanical contract for the ice rink and Fantech supplied 26 general exhaust fans and smoke spill fans for the project.

Project Manager Garry Muscat said the Icehouse was the first professional ice-skating rink to be built in Melbourne for several decades and presented unique challenges as Olympic standard ice rink construction was unfamiliar within Australia.

Melbourne-based Cox Architects also sought guidance from abroad and designed the $58 million complex in collaboration with Canadian ice-sports specialist architects, Brisbin Brook Beynon, and international engineers ARUP.

"Ice rinks require stringent temperature and humidity control," Garry said. "The air temperature is maintained at 16°C, but at this temperature any moisture in the air could create fog. Fogging would obscure spectators' vision and could present health and safety issues because of it. To reduce fogging humidity is kept at 40-45%."

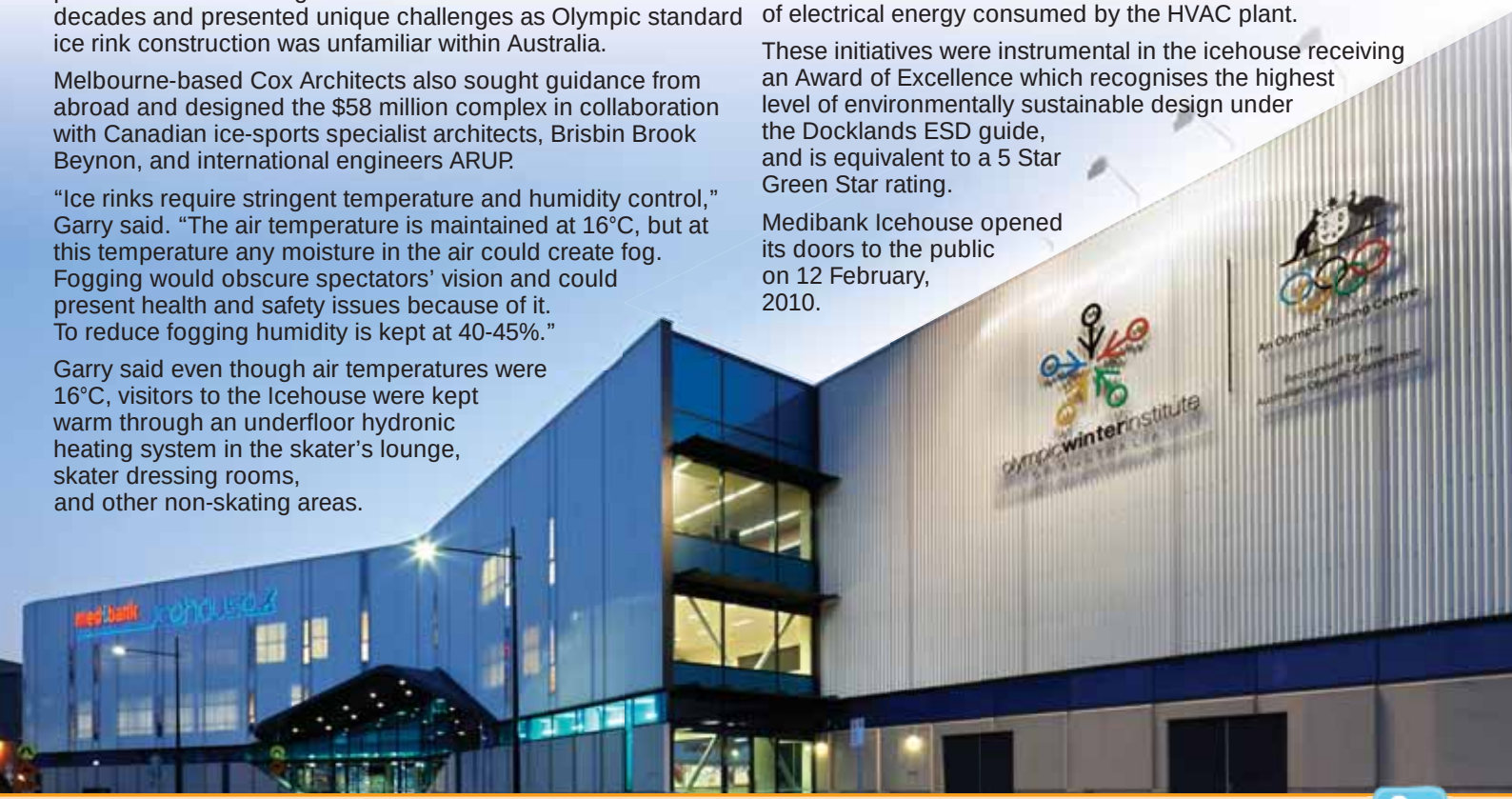
Garry said even though air temperatures were 16°C, visitors to the Icehouse were kept warm through an underfloor hydronic heating system in the skater's lounge, skater dressing rooms, and other non-skating areas.

Like all commercial developments in Docklands, the Icehouse must meet a set of minimum performance standards outlined in the Melbourne Docklands Ecologically Sustainable Development (ESD) Guide. The guide was the first operational Green Building Rating tool in Australia and was a key reference tool in the development of Australia's Green Star program by the Green Building Council of Australia.

Garry said they had used a heat exchanger to reclaim heat from cooling tower condenser water and use this for the underfloor hydronic heating, and heating of the rink air. Similarly, in summer, some of the Fantech relief air fans are used to extract cooler air from the rinks and, via a heat exchanger, precool warmer fresh air. This was an ESD initiative to reduce the amount of electrical energy consumed by the HVAC plant.

These initiatives were instrumental in the icehouse receiving an Award of Excellence which recognises the highest level of environmentally sustainable design under the Docklands ESD guide, and is equivalent to a 5 Star Green Star rating.

Medibank Icehouse opened its doors to the public on 12 February, 2010.



Technically Speaking

with Jack Pirie

Want to reduce a fans energy consumption?

Here's some low hanging fruit

In the Fans by Fantech catalogue the 'Installation Do's and Don'ts' section illustrates some of the common errors made when installing fans. Some are simply poor design whilst others are, what is called, 'System Effect'. In this edition of Tech Talk we look at the impact of the discharge of a poorly designed exhaust system, quantify its impact and examine what can be done to improve it.

An example would be to compare the losses at the end of a system with an abrupt discharge to the losses at the discharge of a system with an evase, or discharge diffuser, at the end.

Assuming the abrupt discharge is 800mm diameter, see Fig.1, and the air flow is 8.0m³/s, the losses at this point are as follows:

Discharge losses: $P_{disch} = P_{d1} + k_g P_{d1}$

P_{d1} at discharge = 152Pa.

Loss factor for guard, k_g = 0.25

Loss across the guard = 0.25 x 152 = 38Pa

a/ Total loss at discharge = 152 + 38 = 190Pa

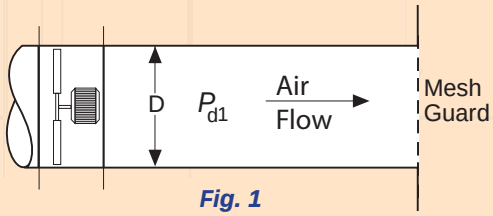


Fig. 1

Now look at the losses in the same system, but one in which the last 1.5D equivalent length of the 800mm diameter duct is replaced with an evase having an included angle of 15°.

The discharge diameter of this system will now be 1120mm, see Fig.2, resulting in a lower discharge velocity and, therefore, a lower velocity pressure. The lower velocity pressure will have a direct impact on the loss across the discharge guard.

Discharge losses: $P_{disch} = k_e P_{d1} + k_g P_{d2}$

Loss factor for evase, k_e = 0.83 *(Ref. AMCA data)*

Pressure loss across evase = 0.83 x P_{d1} = 0.83 x 152 = 126Pa

Velocity pressure, P_{d2} = 40Pa

Loss factor for guard, k_g = 0.25

Loss across guard = 0.25 x 40 = 10Pa

b/ Total loss at discharge with an evase = 126 + 10 = 136Pa

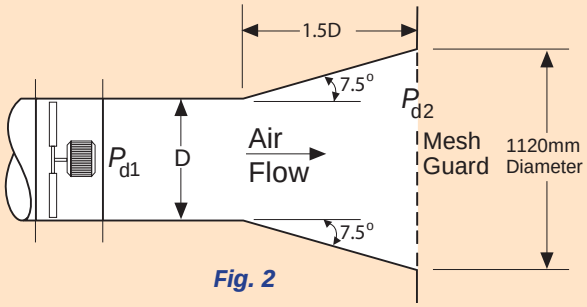


Fig. 2

Therefore, the evase has lowered the system resistance by 190 – 136 = 54Pa

If we now look to see what impact this has on the fan selection, we will look at a typical specified system where:

c/ With the abrupt discharge, the performance required is 8.0m³/s @ 340Pa and,

d/ With the evase, 8.0m³/s @ 340 – 54 = 8.0m³/s @ 286Pa.

Details of the selections are shown in Table 1 and Fig.3 shows the performance curves.

	Duty	Selection	Absorb kW	Motor kW	dB(A) @3m	Capital Cost
c	8.0m³/s @ 340Pa	AP804GP6/33	5.64	7.5	72	$2,470.00
d	8.0m³/s @ 286Pa	AP804GP6/30	4.78	5.5	73	$2,068.00

Table 1

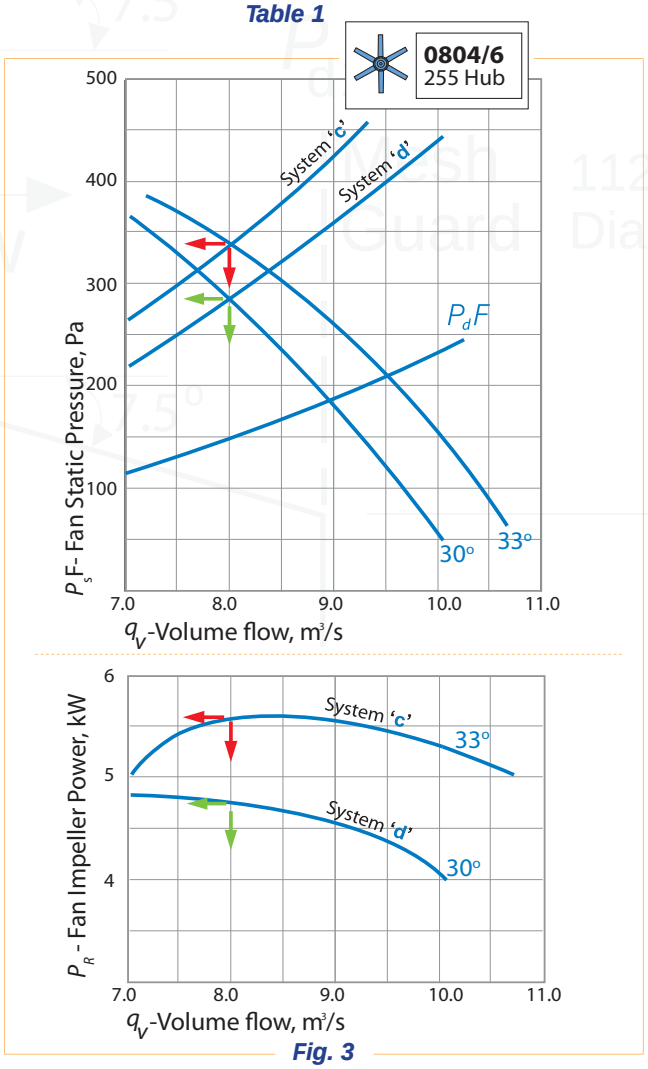


Fig. 3

Energy saved is 5.64 – 4.78 = 0.86kWh or 15%

On a system running 10hrs/day, 300days/yr and at a cost of $0.16/kWh the annual saving would be $413.00.

With the average working life of most fans being 15 years, this would make a total saving of $6,195 over that time. A saving of $402.00 is also achieved with the cost of the fan.

In addition the fan with the smaller motor will produce 2.7 less tonnes of Carbon Dioxide emissions which is a total of 40.5 tonnes over the 15 years. (Australian average)

35mm flanges a neat fit

Installing a fan to duct has just got a lot easier with the change of 25mm flanges to 35mm on Fantech products.

Fantech Engineering Manager Kerry Dumicich said changing to the new size of flange was the outcome of market research into industry practices and needs.

“We discovered that the majority of duct-work suppliers were now folding their own TDF profile flanges, rather than purchasing add-in flanges. Furthermore, as most flange sizes had increased to 35mm, the 25mm Ductmate flange used on Fantech products was not an exact match,” he said. “It made sense that since a high percentage of ducts were fitted with this TDF profile, we should provide a better fitting flange with the same profile.”

The new 35mm TDF profile flanges are now available as standard for the PowerLine, Multiflow, FlexLine and Twin Neta range of products.

Kerry said the new flanges had proven to be winners with installers because they were simple to attach with a bolt in each of the four corners and cleats were now easy to fit. This has simplified and sped up the fan installation process as well as reduced the need for reworking on site, he said.

‘Just as important, by ensuring the flange is correctly in place with a good fit, it means, the joins are virtually airtight so the efficiency of the system is not compromised.”

Certified and new dimensional drawings are available from Fantech on request.

Fans by Fantech
Product Selection Program

with Stuart Bryson

Tip No.11:
Selecting for Hazardous Environments

When selecting Adjustable Pitch Fans for Hazardous Environments, you must carefully review and consider both the motor type and impeller material.

The Fantech Product Selection Program allows you to choose from three hazardous motor types: increased motor safety (Ex e), flameproof for industrial use (Ex d) and non-sparking (Ex n). In addition to the standard Aluminium and Plastic (GRP) impeller materials, you can also select Anti-Static GRP – refer to the specification of the particular project for the correct motor and blade types.

First, select ‘Detailed Axial Adjustable Pitch’ from the Fan Types, and pick the desired case type. In the ‘Motor’ drop down on the ‘Selection Details’ screen, change from the default (‘Standard’) to the relevant type. If you need to specify the ‘Impeller Material’, change from the default (‘Any’), before clicking ‘Select’.

To select a hazardous environment fan from the ‘General Products’ range, tick the ‘Explosion Proof Motor’ option from the ‘Mounting Type’ list.

Marketplace central to Pakenham growth

As one of five growth areas designated by the Victorian Government under the Melbourne 2030 policy, Pakenham will benefit from a new 20,000 square-metre retail development.

The Cardinia shire is reported to be growing by an average of five families a day and is in urgent need of modern retail facilities. Located on a 2.9 hectare parcel of land, Pakenham Central Marketplace will fulfill this role, providing a Woolworths supermarket, Big W, Dick Smith and Planet Surf stores as well as a range of fashion, general merchandise and fresh food outlets.

The Hacer Group won the contract to construct the complex with Corbritt Air-conditioning providing the mechanical services.

Site Foreman Steve Devine said two double width, double inlet, aerofoil centrifugal fans had been designed into the carpark ventilation system. “However installation of the second fan was certainly a challenge, as it had to be brought in through the carpark entrance. Weighing almost 3.5 tonne, and with a height of over 3 metres, we were left with only millimetres to spare as we fitted the fan into position,” he said.

Made by The Fan and Blower Company of Australia (FBA), the two fans act as a primary exhaust for the 1100 space underground carpark. Here eight strategically placed JetVent impulse fans mix the fresh air in the car park and thrust contaminated air towards the FBA fans for exhaust.

Architecture by i2C Design & Management

“...its speed runs according to the demand in the carpark.”

Fantech Victorian Project Manager Phil Nevill said it was an energy efficient system where carbon dioxide sensors monitored and controlled the speed of the JetVent system and the primary fans. “Each of the FBA fans is fitted with a 45kW motor and has a capacity of up to 55,000 litres a second, but its speed runs according to the demand in the carpark. This provides considerable power savings without compromising the quality of air within the carpark,” he said.

FBA specialise in the design and manufacture of centrifugal fans and industrial blowers. The company has an established marketing arrangement with Fantech to distribute their HVAC products. This means companies like Corbritt Air Conditioning can source a mix of smoke spill and general exhaust fans as well as specialised impulse and centrifugal fans from the one supplier.

The Pakenham Central Marketplace is expected to be open in time for Christmas shopping.

Product News

with Adrian Bartlett

Air Design release new range of Energy Recovery Units

Air Design has just released a new, defined range of energy recovery units, developed and manufactured in Brisbane.

Air Design Air Handling Unit Sales Manager, Adrian Bartlett, said heat exchangers were fast becoming more popular as architects, developers and building owners searched for technologies that would help to reduce the cost of heating or cooling an occupied space.

“Heat exchangers transfer the heat (or cool) from the exhaust air leaving a building, to the fresh air coming in. This means less energy needs to be expended to bring the fresh air up to (or down to) the required indoor temperature and therefore saving cost,” he said.

This high quality, locally made range of energy recovery units, complement Air Design’s Modutherm Air Handling units and fan coil products. This new range consists of the Compact and Plantroom Series, and as the name suggests, the Compact Series includes four low profile products with their maximum height between 450 and 650mm and an air flow capacity between 200 and 900L/s which makes them ideal for in-ceiling mounting. The larger capacity Plantroom Series has an air flow capacity between 700 and 1800L/s and a configuration that has one fan on top of the other. The Plantroom Series is much taller but are still compact and are ideal where larger air flows are required.

Adrian said the range came with two different heat exchange options – total energy transfer or sensible only energy transfer.

“The total energy transfer exchanger transfers both latent heat and moisture and is ideal for areas with high humidity. It is made from a special moisture infiltration paper which allows water molecules to pass between airstreams,” he said. “However, most applications only require sensible heat exchange and this is achieved with an aluminium heat exchanger.”

“We manufacture the energy recovery units to the same high standard as our Modutherm air handling units. They all have an extruded aluminium pentapost construction and double-skin polyurethane-insulated panels with a colorbond exterior. A side panel with quick release quarter turn locks, allows easy access to internal components for maintenance and service.”

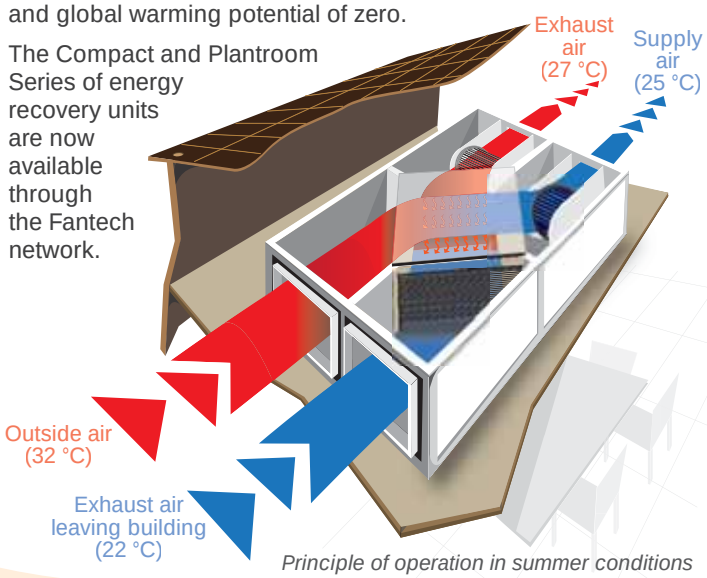
Compact Series

Plantroom Series

The units come with a variety of direct-drive single-phase fans, with an option for EC motors. They also feature Integral 50mm deep panel filters for both exhaust and supply-air streams.

Adrian said the energy recovery units were a good option for developers looking for ‘green’ products. The polyurethane used in the panels does not contain hydro-fluorocarbons (HFCs) or hydro-chlorofluorocarbons (HCFCs) and has an ozone depletion potential (ODP) and global warming potential of zero.

The Compact and Plantroom Series of energy recovery units are now available through the Fantech network.



Principle of operation in summer conditions

Lean & green

Fantech is undergoing a ‘Lean to Green’ program to maximise efficiency and sustainability. The program began in June 2010 and aims to reduce the company’s impact on the environment by reducing landfill, its carbon footprint and gas emissions.

Manfred Adam, from Fantech’s Operations team, oversees the program.

“Closer inspection of our waste disposal practices revealed just how costly it was to dispose of the scrap materials,” he said. “We did not want to continue sending it to landfill and began the search for more sustainable options.”

“As part of the program we have rationalised our suppliers and in doing so have achieved high levels of recycling and placed a greater emphasis on reducing gas emissions,” he said. “For example, each day about 25 kilograms of plastic waste, that’s up to 6 tonnes per year, is now being recycled. Blade off-cuts are segregated and returned to the current supplier for reuse. Waste plastic created in the manufacturing process is also placed in bales for recycling. Amcor collects the bales weekly and pay a rebate for the material.”

“Broken pallets were also sent to landfill but are now collected by our pallet manufacturer who directs them to be recycled as timber chips for freeway landscaping.”

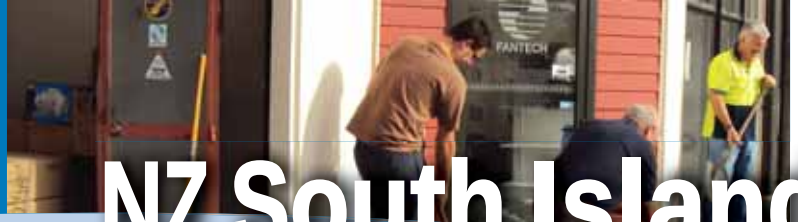
“As a result of the program we now have significantly less waste going to landfill. Since June 2010 we have recycled 41 tonnes of cardboard, 8 tonnes of metal and 7.5 tonnes of plastic. We also have fewer deliveries and pickups meaning reduced carbon miles and gas emissions.”

> **“ … each day about 25 kilograms of plastic waste… is now being recycled. ”**

The program also looks at water and energy use. The first wastewater assessment reported that 4.5 million litres of water was being used annually during fire sprinkler system testing.

Manfred said by adjusting the system’s pressure relief valve and switching to a maintenance regime where sprinklers are tested monthly instead of weekly, water use was slashed to 800,000 litres a year, a saving of 3.7m litres or 83%.

Manfred said the program was ongoing, but already Fantech had made considerable gains in achieving a lean and green sustainable approach to manufacturing.



NZ South Island remains strong

Shaken by a string of earthquakes and tragic loss of life, New Zealand's South Islanders have found strength in the support of friends and colleagues.

The most serious was a shallow quake of 6.3 magnitude on 21 February. It occurred on a new fault line close to Christchurch, where it caused extensive damage to the city centre and great loss of life. It was followed by numerous aftershocks, the most violent 5.5 and 6.0 magnitude quakes on 13 June.

Fantech's Christchurch office was closed periodically as staff attended to damage caused by the earthquakes. Fantech NZ Southern Area Manager, Mark Rickard, said soil liquefaction had created the most problems. "The saturated sediments broke through our basement floor and have flooded the building on numerous occasions. We have taken remedial action and have had to clean up a number of times," he said.

Fantech was prepared to transfer staff to other areas, but with homes and jobs intact they decided to stay and help others. "The support from Fantech has been fantastic," Mark said. "The main office in Auckland and the Asia Pacific head office in Melbourne were in constant communication with us, to ensure we were all safe".

"A large number of fans were damaged in the quake, so we have pulled out all stops to help clients with urgent issues," Mark said. "We have the largest stock holding of any fan supplier in New Zealand, so we are able to respond to customers' needs in a prompt manner."

Mark said that prior to the earthquakes, most of their work was capital projects, but now the focus was on remedial work and retrofits of warehouses which have become offices. "We have assisted consultants and contractors alike with technical expertise. This has enabled the end user to be relocated into reconfigured buildings in the shortest possible time frame, with ventilation systems that work in buildings that were not originally designed for multiple occupancy."

There are reports it will take Christchurch 15-20 years to recover. Buildings are still being carefully deconstructed and concept drawings are beginning to appear, but plans and construction are yet to be commenced.

Mark said it had been a tough six months for the South Island which was still reeling from Pike River Coal's underground mine explosion on 19 November 2010. "These disasters have seen the entire country band together to provide financial, physical and emotional support, it really is outstanding and stands us in good stead for the future."

Investing in the future through education

From its inception in 1973, Fantech has been driven by its need to continually improve its products and service. This philosophy extends to employees and customers who are encouraged to train and expand their knowledge and skills on an on-going basis.

One such example is Brad Ackehurst, who joined Fantech 26 years ago and has worked hard to further his career. He began as a sheet metal apprentice and at the completion of that was offered a production support role.

"As these new opportunities arose I felt it was important to further my education so that I could make a significant contribution to the roles," he said. "I completed a Diploma in Purchasing and Materials Management through Central Queensland University and was offered entry into the business degree – Bachelor of Business - Specialisation in Operations Management."

The degree took Brad eight years to complete part-time by correspondence and included core subjects such as accounting, marketing, economics and many more. It also included specialist units on production and operations management, supply chain management and procurement management. Fantech has supported Brad in his endeavours, allowing him to sit exams during work hours and providing him with financial assistance towards the cost of his education.

Fantech Managing Director Chris Ogilvy said: "Furthering the education of our staff is a wise investment that has many benefits to the company and our customers. Brad's studies have equipped him with the necessary skills and knowledge to enable him to rise through the ranks to Production Manager and on through to National Operations Manager."

"As a result Brad has been a key figure in transforming the manufacturing practices at Fantech with Lean Manufacturing and his contribution and implementation of Clear Vision, a system that delivers real time data to the relevant staff on the status of jobs in the system. The system also incorporates capacity planning, a skills matrix and delivers live work orders electronically to the assembly areas."

Brad said he had developed a real thirst for knowledge, which he transferred into his work environment. "I investigate concepts and ideas more thoroughly and as a result it creates new opportunities that enhance the level of customer service we provide," he said. Fantech is proud of Brad's achievements and congratulates him on his recent degree and long-term contribution to the company.

CELEBRATING 50 YEARS
WOOD & GRIEVE ENGINEERS

Wood & Grieve celebrate 50 years

Staff photo of Wood & Grieve Engineers, Melbourne branch

The Wood and Grieve story began 60 years ago when Tony Wood and Kip Grieve met at the University of Western Australia. The friends then flatted together in London while gaining international experience and later joined forces in Australia to form Wood and Grieve Engineers in 1961.

Initially based in West Perth, this two-man consultancy specialised in structural and mechanical engineering. Fifty years on, Wood and Grieve offers a range of engineering services from acoustics, right through to property asset management, and now employs more than 300 staff across Australia and China (Shenzhen).

Company Director, David Simpson, said the firm had been busy recently in the health sector, working on the Fiona Stanley Hospital in WA, the Epworth Hospital in Richmond Victoria, the bid phase of the new Cancer Centre in Melbourne and the planning stages of Campbelltown and Macquarie Hospitals in NSW.

"We are pleased to have recently won the BRW Client Choice National Awards for Exceptional Service, and Outstanding Client Care and I think that can be related back to the client service culture originally instilled by Tony and Kip."

In 1977 Wood and Grieve allowed its senior staff to purchase into the company and in 2009 it became an unlisted public company, 100% owned by its working principals. David said the vested interest of senior staff was one of the key reasons the company had been so successful and continued to expand.

In 2008 the company acquired Swaan Consulting in Brisbane, a civil engineering company, and opened their first international office in Shenzhen, southern China. "It is currently helping out with some of our Australian projects, but the next step is to find Chinese projects and begin to build a reputation," he said.

Locally they are excited to be part of the Upper West Side development on Spencer Street, Melbourne, a project by Far East Consortium. "The project is one of the largest inner city developments in Australia with 2600 apartments over four towers including ground floor retail, cafés, gym, function centre and garden lounge," he said. "With double-glazed windows, provision for recycling rubbish and almost one acre of podium rooftop garden, the development is loaded with 'green' features. It has just achieved a 5 star Green Star Residential rating, the first Green Star Residential certified rating in Australia."

"...the Upper West Side development ... is one of the largest inner city developments in Australia..."

Fantech congratulate Wood and Grieve on their 50 year milestone.

WOULD YOU LIKE MORE INFORMATION?

- ☐ Please send me a "Keen to be Green" Mouse Mat.
- ☐ Please send me a "Keen to be Green" Poster.
- ☐ Please send me a copy of the Energy Recovery Units Catalogue.
- ☐ Please send me a copy of the Fans by Fantech Product Selection CD.
- ☐ Please send me a copy of the current Fans by Fantech Catalogue.

We know you enjoy Tech Talk. How would you prefer to receive it?

Please tick one, complete your contact details and return it to us.

- ☐ I would prefer the electronic version of Tech Talk only.
- ☐ I would prefer to get both electronic and printed versions of Tech Talk.
- ☐ I would like to be removed from the Tech Talk distribution list.

Have you relocated? Please help us keep our records up to date by including your new details.

NEW DETAILS

Name: .....

Position: .....

Company: .....

Address: .....

Suburb: ..... State:..... Postcode: .....

Tel: ..... Fax: ..... E-mail: .....

OLD DETAILS (if applicable)

Name: .....

Position: .....

Company: .....

State: .....

Photocopy this form and mail or fax the information to: Fantech Pty. Ltd., 42 - 62 Pound Rd West, Dandenong South, Vic. 3175, Australia. Fax: 61-3-9554 7833 or E-mail: rmayen@fantech.com.au

Fantech - a member of the Elta Group of Companies

Fantech Contacts

Australia	
Adelaide	(08) 8294 0530
Albury	(02) 6025 1866
Brisbane	(07) 3299 9888
Canberra	(02) 6280 5511
Darwin	(08) 89470447
Launceston	(03) 6344 6888
Melbourne H.O.	**(03) 9554 7845**
Melbourne CBD	(03) 9696 3044
Geelong	(03) 5229 0188
Newcastle	(02) 4961 6088
Perth	(08) 9209 4999
Sydney	(02) 8811 0400
Sydney CBD	(02) 9698 8130
Sydney South	(02) 9153 6005
Townsville	(07) 4775 5222
Wollongong	(02) 4226 5133
New Zealand	
Auckland H.O.	(09) 444 6266
Christchurch	(03) 379 8622
Wellington	(04) 566 0532
Asia	
For agents in the Asian region call	(603) 5121 4453
or visit	www.eltafantechasia.com

Visit our website at **www.fantech.com.au**

FSC SGS-COC-2586

NATSPEC ProductPartner