Launceston General Hospital, Tasmania

BACKGROUND

Launceston General Hospital is a 300 bed public hospital providing acute care facilities for residents of Launceston and the Northern Region of Tasmania and treats over 24,000 inpatients and over 220,000 outpatients annually.

Faced with escalating power costs the Department of Health and Human Services enlisted the expertise of Tasmanian gas distributor, Tas Gas Networks, to develop recommendations that would deliver the hospital substantial environmental, financial and energy supply benefits.

Tas Gas Networks’ Industrial Manager, Fraser Kirkpatrick, was intimately involved in the production of a cost benefit analysis submission that demonstrated the advantages of installing the hospital’s own cogeneration plant to meet their power and heating needs.

According to Fraser, Launceston Hospital was burning heavy oil to fire two old boilers that supplied steam to the laundry house and LPG for heating, hot water and cooking, but didn’t have their own large-scale emergency power plant.

REQUIREMENTS

“As the only natural gas distributor in Tasmania, Tas Gas Networks have available networks to supply over 40,000 commercial and residential customers in Tasmania through a 712 kilometre network of pipeline, and our focus is on facilitating the adoption of this environmentally friendly energy source in order to reduce the State’s reliance on imported fuels, coal and diesel standby generated power.

“With Launceston Hospital we looked at the various options available and then opened an expressions of interest process that sought submissions from interested parties.

“Based on these submissions we prepared an open tender and then selected a preferred supplier based on a combination of best price and best outcome.

SOLUTION

“Energy Power Systems Australia was the successful tenderer with a Caterpillar cogeneration plant based on an attractive price and the fact that they had an extensive range of gas fuelled generators operating in Australia. The Cat equipment was also supported through the Launceston based Caterpillar servicing dealer, William Adams – which was another key factor.

“Energy Power Systems’ solution delivered the hospital a cost effective package that not only met their heating and hot water requirements, but provided them with their own base load power capacity which meant they could secure their long term energy costs and guarantee them security of supply, which was a major concern to the hospital.

“So, in the end the cogeneration plant not only enabled the hospital to isolate themselves from the power grid, and therefore the costs the Department of Health and Human Services currently pay. It also provided a substantial environmental, financial and energy supply benefit.

LOCATION

Launceston General Hospital, Tasmania

CUSTOMER ISSUE

Tasmania was experiencing escalating energy prices and increasing uncertainty over the effects of the proposed tax on carbon, so Launceston Hospital was looking for an all encompassing energy solution that would enable them to get off the power grid and fix their energy costs.

SOLUTION

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PRODUCT

2 megawatt Caterpillar G3520C co-generator set complete with heat recovery and remote monitoring systems.

FURTHER INFORMATION

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vagaries of supply, the investment also provided it with more than 80% of its base load power requirements and a significant amount of its thermal energy requirements as a by-product of the Natural Gas powered cogeneration plant.

“And in terms of savings, based on the price of energy at the time of commitment the 2 megawatt Caterpillar cogeneration plant was forecast to save more than $20 million in energy costs over 15 years, and see the initial capital outlay recovered within 5 years of operation.

“Energy Power Systems was responsible for the plant’s design, installation and incorporation of the latest energy management technology to enable the equipment to be monitored remotely by William Adams, as well as alerting staff on-site via SMS if a problem arises so that any issues can be dealt with quickly and effectively.

RESULT

“Since the hand-over the cogeneration plant’s performance has been very, very good, and has delivered on every level of the tender and positions the hospital to capitalise on the escalating cost of power that is expected when a tax on carbon is introduced.

“The cogeneration plant has proved to be an extremely sensible and cost effective solution for the hospital and has provided us with a real-time demonstration site for other potential industrial users, enabling them to see this ground-breaking energy saving concept in action,” Fraser said.

Energy Power Systems Australia’s Engineering Manager, David Etherington, headed the project and following commissioning in May 2010 said that the entire team was delighted to have been able to provide Launceston Hospital with a state-of-the-art cogeneration plant that delivered savings, continuity of power supply and a substantial reduction in exhaust emissions.

“Being the first cogeneration plant of its kind in Tasmania the pressure was on from day one to make the entire upgrade process as seamless as possible, and while the project threw up a number of unique challenges the end result is a credit to all involved.

“At the heart of the plant is Caterpillar’s world proven 2000 Ekw G3520C low emission gas generating set that is engineered to deliver unmatched performance, reliability, durability and cost effectiveness.

“The project’s scope of works was extensive and included everything from the engine’s specifications through to site preparation and supply of ancillary monitoring and interface equipment.

“To meet the hospital’s thermal demands the G3520C Caterpillar cogeneration set was fitted with a jacket water waste recovery heat exchanger, an exhaust waste heat exchanger and a remote aftercooler water and dump waste heat radiator.

“Noise and vibration were big issues for the hospital as the plant room was located directly under the hospital’s library. As a result, a high level of attention was paid to the acoustic and vibration isolation systems that ultimately incorporated airbag vibration isolators, an isolated foundation slab and an acoustic enclosure complete with ventilation system.

“Other interesting aspects included the inclusion of gas leakage detection equipment, a fuel gas reticulation system and motor control centres and variable speed drives for the cooling fans and pumps to reduce parasitic power losses.

“Once installed the cogeneration plant was interfaced with the hospital’s existing building management system and a remote human machine interface system was installed to facilitate performance monitoring, diagnostic checks and fault identification by remote technicians.

“The plant was then integrated with the hospital’s existing hot water systems to automatically direct the waste heat recovered into the hot water reticulation system, reducing the need to heat the water with less efficient boiler equipment.

“And in terms of efficiency, with electricity generation and waste heat recovery the plant is capable of an overall thermal efficiency of over 86%,” David said.