



ENGINEERS
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Timor Sea LPG plant wins top engineering excellence award

The LPG facility located in the Timor Sea which includes the most complex liquid stripping plant ever built offshore, and the largest investment proposed for the Timor Sea, has been awarded the 2006 Sir William Hudson Award for engineering excellence, at the 2006 Australian Engineering Excellence Awards in Canberra last night.

Known as the Bayu-Undan Development – Phase 1, the project uses cutting edge technology to recover oil and gas that would otherwise be too costly or difficult to tap.

The project set many new benchmarks in its engineering, not the least being its size given its hostile weather and ocean environment. Bayu-Undan is a world-class gas and gas condensate deposit located in the Timor Sea. To manage the US\$1.9bn gas recycle project, ConocoPhillips contracted Fluor Australia and WorleyParsons.

Phase 1 involved the separation of condensate and natural gas liquids, and storage in a multi-product floating storage off-take vessel before being sold via tanker. The remaining lean dry gas was re-injected into a sub-sea reservoir. Approximately 22 wells are required over the life of the project and 13 were drilled in the first drilling program.

As a world first for LPG offshore processing, Fluor Australia and WorleyParsons used state-of-the-art processing technology and comprehensive risk analysis to manage the process complexities. Facilities and other structures were extensively modelled in 3D utilising advanced PDS model technology. Surface facilities consisted of three primary components: the Central Production and Processing Complex, Wellhead Platform and the Floating Storage and Offloading vessel.

The other 2006 Australian Engineering Excellence Awards winners were:

- **Westlink M7 Motorway** - This \$1500m project is Australia's largest operating urban road project. It was delivered under a "public private partnership" model to the satisfaction of all stakeholders and even at this early stage of operation, it is clear that it is one of Australia's most successful pieces of infrastructure. Maintaining a major focus on safety, including construction of the largest interchange in the Southern Hemisphere over and around traffic on one of Sydney's busiest motorways, the project involved massive logistics for the design and construction of 144 bridges, 7 million cubic metres of earthworks, 40km of motorway, 47 km of noise barriers, 42 km of shared path and 20km of local road upgrades. Abigroup Contractors Pty Ltd, Leighton Contractors Pty Ltd, Maunsell, SMEC and the Roads and Traffic Authority of NSW delivered the M7.
- **Bushlight – Light & Life in the Bush** is a renewable energy project that has provided sustainable energy services to more than 2000 people living in 80 remote indigenous communities across Northern & Central Australia. Formed in 2002 to address critical shortcomings in the reliability and performance of renewable energy the project has created a new Australian and international benchmark for the design and performance of small and medium scale renewable energy systems and has helped expand the renewable energy industry in Australia. The project was developed by the Centre for Appropriate Technology in Darwin.

- **CondensorBoost™** is a patented system for improving the performance of the main condenser used to condense exhaust steam from a power generating steam turbine. Cooling water is redirected from the auxiliary cooling system back through the condenser, thereby maximising heat transfer and recycling water, improving turbine efficiency by up to 0.5% in summer. First implemented at the Callide B Power Station in Queensland, it reduced coal burned by 10,000 tonnes a year and carbon dioxide emissions by 36,000 tonnes per year. The system was developed by Sigma Energy Solutions Pty Ltd and CS Energy Corporation.
- **Starbug** is a novel robotic vehicle developed for underwater monitoring and surveying of the Great Barrier Reef. Starbug achieves this with a small, low cost, easy to use, untethered vehicle which displays remarkable design ingenuity. Key innovative features include an advanced stereo vision navigation system and slim-line “flat” manoeuvring thrusters of unique design. Such vehicles are receiving attention worldwide, but prior to Starbug, efficient navigation without tethers and significant external infrastructure had not been achieved. Starbug is a world-class item of equipment that not only enhances reef research but has many other potential commercial uses. Starbug was developed by the CSIRO ICT Centre.
- **The VentrAssist Left Ventricular Assist Device (LVAD)** is a third generation centrifugal implantable blood pump designed for long-term use in patients with advanced heart failure. It is an alternative to heart transplantation and is capable of restoring patients to normal health and daily activities. The core of the system is a small blood pump featuring patented contactless bearings, a laser-welded hermetic titanium-alloy structure, unique blood compatible diamond coatings and an integrated slotless motor. There are no wearing parts, yielding operation in the body indefinitely without maintenance. The device was developed by Ventracor Limited.

The Australian Government’s Engineering Innovation Award, sponsored by AusIndustry, was won by a **new device for treating Obstructive Sleep Apnea**.

It has been estimated that up to 10% of the community suffer sleep disorders of some extent. Disorders such as obstructive sleep apnea are insidious and progressive, reducing quality of life, and increasing mortality through effects on the cardiovascular, metabolic and autonomic nervous systems. The integrated S8/Swift system for treating obstructive sleep apnea by continuous positive airways pressure consists of an airflow generator (S8) that directs air to a mast (swift), with soft tubes making an airtight seal into the nostrils. The system meets the extreme requirements of comfortable maintenance of a therapeutic pressure of air to the nose with minimal noise during 8 hours of sleep. The distinctive advances in engineering over prior and competing systems are its modular construction, and most importantly, compact size. The device was developed by ResMed Limited.

The Environmental Engineering Excellence Award, sponsored by the University of Technology Sydney, was awarded to the **Victor Harbour Wastewater Treatment & Reuse Project**.

The South Australian Water Corporation called for tenders for a new state of the art wastewater treatment plant capable of providing high quality treated wastewater to reduce environmental impacts and facilitate further reuses in the coastal town of Victor Harbour on Encounter Bay, SA. Provided through a Build Own Operate Transfer contract, Victor Harbour wastewater treatment plant is now a state of the art facility capable of providing high quality treated wastewater that is reused on irrigation and providing environmental flows to the local river. The plant is the most advanced in Australia. The project was delivered by United Utilities Australia.

The Engineers Australia National President's Prize was awarded to **The Stingers**, a team of 5 Australian schoolboys from Trinity Grammar School in Melbourne, and Australian champions of the Schools Innovation Design Challenge, took their winning model car and portfolio of supportive work to the International Championships in the UK, competing in the F1inSchools World Finals.

Competing against teams from 17 countries they won the title of World Champions and best Engineered Design. Producing a body of work that impressed Europe's top engineering executives with its innovation, understanding and use of advance engineering techniques they received international acclaim for their work – all the more outstanding given the fact that the boys are 13-14 years of age.

Full details of all 41 projects for the awards are at www.engineersaustralia.org.au .

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