

# Supporting the Antarctic programme

Significant changes have occurred over the past 25 years in the way the Australian Antarctic programme is supported.

The 80s was the decade of a major rebuilding programme for the Antarctic stations. The period involved a working relationship with the building contractor – the Department of Housing and Construction – and opened up opportunities for more people to work in Antarctica. Many more trades personnel were required, especially those with construction experience, as well as plant operators, riggers, painters and carpet layers. This left little accommodation capacity for station-based scientists. Instead, a number of glaciological traverses were operated from Casey, and summer bases were established at Edgeworth David Base in the Bunger Hills, west of Casey, and Law Base in the Larsemann Hills, west of Davis.

Gaining knowledge of construction techniques in the harsh, cold environment was a major challenge, requiring novel and innovative design solutions to overcome a range of problems – including establishing foundations in areas of permafrost and the production and curing of concrete in sub-zero conditions. A new building system – the Australian Antarctic Building System – was introduced. This comprised a steel framework on concrete foundation pillars and floor, with large foam insulated panels. New two-storey buildings with modern kitchen, dining, medical and recreational facilities, and more comfortable bedrooms and living areas were provided.

A number of purpose-built, separate, single-storey buildings were also constructed to house science laboratories and operations centres (incorporating communications facilities). Office space, balloon release buildings for the Bureau of Meteorology, trade workshops, stores buildings, wastewater treatment buildings, water tank storage, and high temperature incinerator buildings, were also provided.

The buildings are energy efficient. They use triple-glazed windows, heavily insulated wall panels, and are heated with waste heat from the powerhouse. A Building Monitoring and Control System (BMCS) was installed to allow staff at the stations and at Kingston to monitor (and control) the operation of all the building facilities such as temperature, air quality, sewage, water, power and heat production. The BMCS has allowed the fine-tuning of the operation of the building facilities, optimising both the energy usage and living comfort.

Also during the 80s, changes to recruitment and administrative processes for selection of expeditioners and station leaders were introduced, to improve processes for selecting personnel for Antarctic service. Management consultants were employed to deliver pre-departure training to reinforce behavioural standards. A new performance appraisal system was also introduced to provide regular feedback to expeditioners on their performance, and more reliable information for possible future re-employment.

At the same time an Antarctic Code of Personal Behaviour was implemented. Expeditioner training both pre-departure

and in Antarctica was improved to reflect changes taking place in community standards, including increased responsibility for others' safety and well-being, alcohol use, and recreational pursuits (to reduce the chance of injury and time off work). New environmental and safety standards resulted in the implementation of waste minimisation strategies, training in search and rescue, fire fighting and vehicle driving, personal protective measures, and risk assessments for new activities. A new category of expeditioner was recruited, the Field Training Officer, employed to train expeditioners in safety and survival skills necessary to work and live in Antarctica.

The rebuilding programme delivered other significant operational changes, with a requirement for a larger ship than *Nella Dan* or *Nanok S*, which had been used for a number of years to move expeditioners and cargo to and from Antarctica. In 1984 a 10-year charter was entered into with the German owned vessel *Ice Bird* – a special purpose ice-strengthened ship, with a large crane and cargo capacity, and the ability to carry over 100 passengers. The ice-strengthened, Canadian-owned *Lady Franklin* was also chartered. In 1989, the construction and long-term charter of the Australian owned and operated *Aurora Australis*, provided a multi-purpose platform for Antarctic use.

The 90s saw the completion of the rebuilding programme; continuation of tractor train traverses (remote, long range, field travel) in support of the glaciology programme, but now operated out of Mawson; a small team winter at Heard Island; summer programmes undertaken in the Bunger Hills, Prince Charles Mountains and Larsemann Hills; and the return mid-decade to a one ship operation in support of the Antarctic programme. *Ice Bird* continued to support the programme until the end of her 10-year charter period. This was also the era of the introduction of long-range helicopters, capable of flying between stations and deep inland in support of field science projects.

Further changes included environmental management policies to reflect obligations imposed by the Antarctic Treaty system and changes to domestic legislative requirements for occupational health and safety. These changes necessitated revision of the expeditioner training programme. Competency-based training modules were developed for safety and environmental training programmes, to test knowledge and understanding. As a result, emergency response training scenarios are now undertaken at the stations each year for such things as fuel spills and search and rescue.

The turn of the century saw a return to a two-ship operation with a further three-year charter of the Norwegian-owned *Polar Bird* (former *Ice Bird*) and later the Russian-owned *Vasily Golovnin*. Large wind turbines were installed at Mawson to supplement power generation and reduce fossil fuel consumption. A joint summer field programme was conducted with Germany in the Prince Charles Mountains



In 2004, two CASA 212-400 ski-equipped aircraft were introduced to Antarctica, to support scientific and logistic operations.

WADE FAIRLEY



For decades tractor trains have been used to deliver fuel, food, camping equipment and vehicles to remote field locations.

ANTHONY EVERETT

and there was a return to summer field operations at Heard Island.

Other changes in this period saw the AAD attain international accreditation status for its Environmental Management System (which ensures our activities in Antarctica comply with internationally acceptable levels of accountability) and the development of a Safety Management System (which ensures expeditioner safety in Antarctica through the development of risk assessments, standard work procedures and appropriate training). Revised recruitment practices involving 'selection centres' that specifically assess personal qualities for Antarctic service have been introduced, and are now a standard part of the recruitment programme.

More recently we have seen the move to fixed-wing aircraft operations with the use of Twin Otter aircraft for two seasons, followed by the introduction of two CASA 212-400 ski-equipped aircraft. These will complement the inter-continental jet service from Hobart to an airfield near Casey station. The introduction of a regular air service in 2007 will see the most significant change to the transport of expedition personnel to and from Antarctica in the history of the Australian Antarctic programme.

Operational support for the future Antarctic programme is presently undergoing considerable scrutiny to ensure it best meets the ever-changing nature of the programme and will continue to do so for the foreseeable future.

—RICHARD MULLIGAN  
Support and Coordination Manager, Operations Branch,  
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Expeditioners undertake competency-based training modules in search and rescue techniques.



The AAD's Environmental Management System ensures our activities in Antarctica comply with internationally acceptable levels of accountability.

A major rebuilding programme at each station was initiated in the 1980s and continued until the mid 1990s. The 'Australian Antarctic Building System' consisted of a steel frame on concrete foundation pillars and floor.

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