value of our input to the COMNAP processes and increases our standing in the international Antarctic community.

But this is not all that we do with our COMNAP colleagues. The 'passage way discussions' that COMNAP facilitates are what (perhaps) are of most interest to the people who do the work in Antarctica. They include topics regarding the practical '*what if*" and '*oh really*' and '*how about I do this, if you do that*' interactions between national programs that are important to success in the conduct of day to day operations in Antarctica. For example, the trade that goes on between national operators in 'drums of fuel' that are stored at various Antarctic bases, field camps and caches is pivotal to the success of many programs/projects; just as the sharing of technical/trade support between programs can be important too.

It hopefully will not be surprising to hear that COMNAP provides a valuable means to develop levels of mutual understanding, friendship and familiarity between operators and which allows requests for assistance to be made easily at any hour, and with the assurance that there is a commitment to help out in an emergency if it is at all possible.

In Antarctica there are many more examples of how this support at the operational level works. This season we asked for and received immediate and positive responses for support with flights between Davis and Casey from our Russian colleagues at Mirny; we also received generous advice and assistance with our runway project at Casey from the USAP (I am relieved to report that we gave a little back when the NSF requested our support in the recovery of a data package from a high altitude balloon that landed only 200 km from Mawson); and there was a solid amount of work between the Chinese and Australian programs to deliver and return expeditoners to Zhongshan station. Of course, the longstanding partnership with our neighbouring French colleagues has allowed our project at Commonwealth Bay to progress easily.

In fact, each season the interactions and cooperation shared by the 'operators' allow for better results than would otherwise be possible; they are frequent, regular and operationally very important. I can assure you that we in 'Ops' are extremely grateful for the opportunity to work and share with, and to learn from, the experiences of our colleagues in COMNAP ... the title of this article was chosen with good reason.

Kim Pitt, General Manager Operations, AAD

Mawson: Antarctica's first wind-powered station

On 3 March 2003, the Parliamentary Secretary to the Minister for the Environment, Dr Sharman Stone, opened Antarctica's first wind farm at Mawson. The opening was a culmination of several years' effort by the Australian Antarctic Division to harness the persistent katabatic winds which give Mawson one of the highest average wind speeds in the world. The wind turbines are now generating cost effective, renewable energy to heat and power the station.

Because of the inherent risks of undertaking a major project such as this in Antarctica, the main contractor, the turbine supplier and the AAD agreed to use a partnership agreement for the project – a first for the AAD. The three partners in this endeavour agreed to work together to share the risks and the gains to achieve the most cost effective outcome.

The Darwin-based contractor, Powercorp P/L, supplied new switchboards and engine control systems for the main powerhouse, as well as control software to optimise the wind turbines' and diesel generators' operation against the station heating and electrical load. Powercorp also developed a unique electric boiler-based energy storage system which is used to stabilise the frequency and voltage on the station grid as well as providing for the station's heating needs.

The wind turbine manufacturer, Enercon GmbH from Germany, developed a special cold temperature, high wind version of their E-30 300kW wind turbine, specifically for the Mawson application. The AAD constructed the concrete foundations for the wind turbines and installed the infrastructure and cabling connecting the wind turbines to the powerhouse as well as the new switchboards.

JOHN SMITH

Wind turbines now provide up to 80% of Mawson station's power requirements.

Pouring each 80 cubic metre concrete foundation over the 2002–03 summer required the cooperation of the entire station staff. As well as the specialist trades, the station's scientists, chef, communications staff and the station leader were involved in different facets of the batching, transport, placing and finishing of the concrete. A satellite video link back to Kingston was used so that the design engineers could monitor the process and offer advice if necessary. As it transpired this was not necessary and the foundations were successfully poured and more than met the design specifications.

The success of the cooperation between the three partners resulted in the three turbines being delivered to Mawson, and two machines erected and commissioned during a four-week period. The foundations for the third turbine were not completed in time due to a ship besetment in 2001–02 which meant that materials and construction crew did not arrive in time.

The two turbines have been operating successfully for 12 months. During this period fine-tuning of both the wind turbine and powerhouse control systems has been undertaken to optimise the system operation and to maximise the diesel savings and minimise greenhouse gas emissions. Fuel savings during this first 12 month period amounted to 27 percent, with the wind turbines typically providing 60 percent of the station load, and on average 44 percent. At times, the penetration has reached 80 percent. Further fine tuning including single diesel gen-set operation, during the next 12 months is expected to increase the annual fuel savings from two generators to 51 percent.

Peter Magill, Innovation and Development Engineer, AAD