



IPS RADIO AND SPACE SERVICES ANNUAL REPORT – FY2004/05

Ionospheric Prediction Service

Through the Ionospheric Prediction Service (IPS), the Department provides services and advice on space weather conditions for radio communications and other operations that support and enhance national security, defence, emergency services, public safety and industry.

Support for radio communications and the radio communication industry

Radio communications advice supported the tsunami relief efforts, and defence operations in the Middle East, East Timor and Australian coastal waters. Other specialised services were developed for industry and government, particularly for the Australian Defence Force, Radio Australia, Telstra, Qantas, Virgin Blue Airlines, Boeing Australia, Air Services Australia, Maritime Safety Queensland, SA Transport, the Australian Communications Authority and the Australian Antarctic Division. Specialist work was also undertaken for North Atlantic Treaty Organisation Southern Command, the African Union peacekeeping force for the Sudan and the Italian Air Force in Iraq.

The IPS assisted the Australian Communications Authority with radio propagation advice and radio spectrum policy for international negotiations on radio spectrum allocation, especially in submissions to the International Telecommunication Union.

Customer services

Accurate and timely services on radio propagation conditions are mostly delivered via the Internet, and are based on measurements of the upper atmosphere (the ionosphere), the Earth's magnetic field, and output from the Sun. Use of IPS web services reached record high levels, especially during November 2004 and January 2005, when there was major solar activity. The resulting space weather disturbances were forecast so that customers (aviation, maritime, defence, spacecraft and geomagnetic surveying groups) were forewarned, and able to safeguard against damage or lost data.

IPS real-time services were delivered without discontinuity each hour throughout 2004–05. The number of accesses to the IPS web site reached 29 million, an increase of 40 per cent over 2003–04. IPS provided 170,000 routine services during the year, and the number of participants for IPS training courses on radio propagation and space weather doubled, mainly

through an increase in the number of defence and related industry personnel attending. A survey of 100 customers returned a 98 per cent satisfaction rating against applicability, value, competency and personal attention.

Space weather monitoring network

The Solar Observatory at Learmonth, WA, continued to operate under an agreement between the United States and Australia. Joint management of the observatory provided the United States Air Force and IPS with high-quality space weather data for radio communications and space systems.

Despite the bushfire damage at the IPS ionospheric monitoring site at Perth during January, the delivery of IPS services in real-time continued throughout the year. A new ionospheric monitoring site was installed at Niue in the Pacific in collaboration with the Niue Meteorological Service. Data from Niue will provide more accurate forecasts of radio conditions in equatorial areas of Australian significance. Also, Perth, Canberra and Sydney sites were upgraded to ensure reliability of data. The near-real-time collection and analysis of space weather data is an essential part of many client operations such as the Defence High Frequency Modernisation communications program. Space weather data from the Australian IPS Network are exchanged internationally with data from other geographic sectors.

Partnerships with the space science community

Work commenced on providing the Commonwealth Scientific and Industrial Research Organisation (CSIRO) with ionospheric information in support of the siting in WA of the Square Kilometre Array (SKA), an international radio telescope. The information will become part of an Australian bid for the site to be submitted in late 2005. The SKA will provide opportunities for industry through major construction of roads, communications and radio engineering.

A tour of Australian space science groups and industries was arranged for the United States Air Force Office of Scientific Research during February, to encourage cooperation between scientific groups in both countries.

IPS is working with the Defence Science and Technology Organisation, Geoscience Australia, Australian Antarctic Division, Cooperative Research Centre for Satellite Systems and several university groups on joint space weather monitoring facilities that provide economic access to data for the Australian and Antarctic regions.