



Ionospheric Prediction Service

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

Improved services for Australian business and government

During 2006–07, IPS provided specialised radio frequency services for QANTAS, Jetstar, Virgin Blue, Airservices Australia, the Australian Maritime Safety Authority, South Australia Coast Radio, Victorian State Emergency Service, Department of Defence and others, mostly via the IPS website.

Automatic data analysis software was improved providing an increase in accuracy of ionospheric data products supplied to IPS customers. New web pages to support the International Polar Year (2007–08) programs were developed to provide alerts for space weather events at high latitudes and their impact on activities such as aviation and radio communications.

Consultancy tasks were completed for the Department of Defence in testing radio transmission channel characteristics for the design and progress of the high frequency modernisation communications project. Also, Boeing Australia Ltd renewed its contract for IPS data support to the high frequency modernisation communications project.

Other tasks included advice to Airservices Australia for assessing augmented GPS-based aircraft landing systems, an assessment of the Australian Communications and Media Authority radio direction-finding system, advice on site options for SA Transport for the maritime safety communications and to Airservices Australia in its bid for network-to-area maritime radio distress monitoring.

Customer training courses were presented in Perth, Melbourne, Canberra, Darwin, Sydney and the Adelaide–Edinburgh Air Force Base for over-the-horizon radar personnel.

Alliances with universities and research organisations

A solar wind model was developed in conjunction with the University of Sydney and is now on trial for use in forecasting arrival times of space weather storms. Meanwhile IPS and the University of New South Wales have begun a joint three-year project on 3-D monitoring of the ionosphere using multi-satellite tracking.

In conjunction with the University of Newcastle and the Australian Pipeline Industry Association, a plan to collect data from pipelines is being coordinated. The proposal will help minimise pipe corrosion due to space weather events.

Collaboration with the Defence Science and Technology Organisation testing two digital receivers to monitor radio propagation between Australia, New Zealand and Antarctica as part of IPS and Defence support of the International Polar Year (2007–08) will provide detailed maps of high latitude radio conditions.

Improved data flow from space weather network

Maintenance work has been carried out on the ionospheric and space weather monitoring equipment at Casey (Antarctica), Vanimo (Papua New Guinea), Norfolk Island, Townsville and Sydney to upgrade equipment and improve reliability of data from the monitoring network.

Airservices Australia, the Department of Transport and Regional Services, Defence and IPS are collaborating in preparations to install an ionospheric monitor on Cocos Island. The site will improve space weather and radio predictions in the Indian Ocean area.

International service

IPS participated in several international meetings by presenting scientific papers, contributing panel membership, and providing radio consultancy advice to several overseas organisations.

Specifically, the activities IPS undertook included:

- A radio consultancy task for the Italian Navy (Marina Militare) for antenna radiation maps, on request of Radiocomm Pty Ltd (Italy).
- The New Zealand Defence Force visited IPS Sydney to view online radio prediction methods.
- Telefunken Germany P/L purchased IPS radio prediction software.
- The United Nations World Food Program was advised on radio operations in rural Ethiopia.
- Dr Phil Wilkinson gave the keynote address at the Radio System and Techniques Conference, Institute of Engineering and Technology, London.
- Representing Australia on the editorial advisory board of Space Weather quarterly, a publication of the American Geophysical Union and the International Space Environment Service.
- Presented papers at the International Committee on Space Research's Scientific Assembly and presented at the International Symposium on Antennas and Propagation in Beijing.
- Presented a paper on the IPS World Data Centre for solar-terrestrial science at the World Data Centre Directors' conference in Bremen.
- Joint management of the IPS–United States Air Force solar observatory at Learmonth, Western Australia, has continued the United States–Australia agreement to produce unclassified space weather data for the United States Air Force Weather Agency and IPS.

Advance in standards and technical competency

A joint Australia–United States proposal for improved prediction of radio noise was accepted by International Telecommunication Union standards and a report produced in collaboration with the European Space Agency, France, and Austria on the trans-ionospheric effects on communication systems was adopted by the International Telecommunication Union.

IPS was represented at the Space Development Conference in Canberra and has helped develop a draft 10-year plan for space science for the National Committee for Space Science of the Academy of Science.

Data availability, viewing software and associated technical information from the IPS World Data Centre increased with the addition of data from the IPS Culgoora Solar Observatory, Southern Hemisphere Imaging Riometer and FEDSAT space weather sensors.