

AEGIS NEWSLETTER February 2005

Over the last year Aegis Systems Ltd. has undertaken a number of studies in conjunction with other consultancies to provide our clients with a wide range of specialist expertise across the areas of radio spectrum management and regulation, economics, market analysis, and network planning. We see that continuing in the future and have developed close working relationships with Indepen (economic consultants), Ovum (telecom analysts), and LCC (network design experts). In addition we have been extending our measurement capabilities and in conjunction with our radio propagation and software development expertise can provide a range of services described below.

MEASUREMENT CAPABILITY

Logging software

Aegis has developed a versatile data logging system that can be applied in a wide range of experimental and operational studies. The system allows the gathering, storage, processing and presentation of data from a large number of devices, based on XML standards.

In recent studies, this framework has been used:

- To examine the mutual interference between Bluetooth and 802.11g devices in an office environment, monitoring data throughput as robot positioning devices altered the separation of the terminals.
- To gather data from a mobile wideband channel sounder, operating over a range of some 15 km. The receiver for the sounder was mounted in a car, the position of which was logged to a resolution of 20 cm at normal road speeds. Several gigabytes of data were reliably logged using this scheme.

Channel sounders

Aegis has developed two systems for examining the characteristics of wideband radio channels. One operates at 2.4 GHz, and is intended to explore indoor and short-range propagation effects. This sounder is lightweight, battery-powered and has a resolution of 10 nanoseconds.

A more complex system uses rubidium frequency standards to allow the complex channel response to be recovered. This system operates simultaneously at around 200 MHz, 1500 MHz and 3.4 GHz, and with a nominal EIRP of 200 watts is intended for wide area use.

FUTURE EVENTS

Spectrum Management Strategies

Paul Hansell, Managing Director of Aegis, will be presenting a paper on "Technical issues associated with spectrum liberalisation" at the Spectrum Management Strategies conference in London on 2nd March. Issues that will be addressed by Paul include:

- Packaging spectrum: what are the dimensions?
- Managing the interference environment
- Understanding the implications of spectrum change of use
- International aspects of spectrum liberalisation
- Arbitration in the case of potential disputes
- How incumbents fit into the new liberalised spectrum management regime.

12th CEPT Conference “European Electronic Communications Regulatory Forum

Aegis Principal Consultant John Burns will be presenting a paper on the challenges that spectrum managers face as a result of increasing convergence between the broadcasting and telecommunications sectors. Issues that will be addressed by John include:

- Impact of digitalisation and convergence
- Technology developments facilitating convergence
- Market developments driving spectrum demand
- Implications for spectrum management.

John will also be co-presenting a paper with Phillipa Marks of Indepen Consulting, on “Deregulation, from early reforms to competition-based regulation: scenarios for the future”.

The conference will be held in Barcelona on 13th / 14th April. Full details can be found on the European Radiocommunications Office web site at www.ero.dk.

SPECTRUM REGULATION

Advice on cellular network spectrum issues

Aegis undertook a short study for a network operator in the Caribbean to review and provide comments, recognising best international practices as one fundamental guide, of the mobile spectrum plan and frequency allocation table.

We have also provided assistance, with LCC, to an Asian regulator with issues associated with the allocation of further spectrum to cellular operators. This has included recommendations, based on inputs from industry and expectations of future market development, on suitable frequency bands, minimum bandwidth, method of award of additional spectrum and possible pricing options.

European Commission Study on availability of information on radio spectrum

The purpose of this study was to identify the information currently provided on management and use of the radio spectrum by EU National Regulatory Authorities (NRAs) and through EU-wide facilities such as the ERO Spectrum Information System (EFIS, available at <http://www.efis.dk>) and to assess the extent to which this information meets the needs of spectrum users and other interested parties. The study sought examples of good practice in spectrum information provision and developed recommendations for improvements to such provision in Europe. During the course of the study, questionnaires were circulated to all EU and Accession Country NRAs, and there was extensive consultation with European industry players. A workshop was held to discuss the findings of the study on December 1st 2004 and was well attended by both industry and NRA representatives. At the workshop there was a strong consensus that enhancing EFIS on a step-by-step basis would be the best approach to providing the additional radio spectrum information required by industry. We would like to thank those of you and your colleagues who took the time to provide responses to the Questionnaires.

The final report can be found on the Commission web-site at http://europa.eu.int/information_society/policy/radio_spectrum/docs/info_spectrum/spectrum_info_fin_rep.pdf.

Spectrum Strategy

We have been assisting the Commission for Communications Regulation (ComReg) in Ireland with the preparation of an updated spectrum strategy document, in conjunction with Indepen and Ovum. A public consultation on the document was published on the 9th January and can be found on the ComReg website: www.comreg.ie. Our work identified that users of the radio spectrum contributed €1.9 billion to the Irish economy in 2003, up from €1.5 billion a year earlier. The biggest contributions were from the aeronautical, broadcast and mobile communications sectors. It was estimated that more than 24,000 Irish jobs were dependent on use of the radio spectrum.

WRC-07 support

We are currently providing support to the British National Space Centre (BNSC) on satellite communications related agenda items for WRC-07. BNSC is a voluntary partnership formed from 11 Government Departments and Research Councils to co-ordinate UK civil space activity.

RESEARCH STUDIES

Licence exempt occupancy model

In our previous newsletter we reported that the study into a general method for quantifying spectrum occupancy in licence exempt frequency bands had just been completed. The report has now been published on the Ofcom web-site and can be found at

http://www.ofcom.org.uk/research/industry_market_research/technology_research/ses/ses2003-04/ay4529/perc_ocp_lisc.pdf.

Automatic Transmitter Power Control for Fixed Links

Aegis in conjunction with the Rutherford Appleton Laboratory (RAL) have recently commenced a study for Ofcom into the impact of introducing Automatic Transmitter Power Control (ATPC) in point to point fixed service systems in bands above 13 GHz concentrating on rain fading effects. A simulator will be developed by Aegis that is based on detailed rain modelling undertaken by RAL and current fixed links assignments. The work is intended to demonstrate gains in spectrum efficiency obtained from the use of ATPC and will result in a methodology to be included in the frequency assignment criteria for fixed links. The study is due to be completed by the end of 2005.

Location variability

This experimental campaign, on behalf of Ofcom, to investigate the aspects of radio signal variability has now been concluded. The results of this study formed the basis of a UK input to the ITU-R Study Group 3 block meeting in October 2004.

At this meeting, attended by Aegis staff, Working Party 3K revised Recommendation P.1546, which provides a propagation model for broadcast and mobile services between 30 MHz and 3 GHz. These revisions reflect the results of the Aegis study.

OPERATIONAL STUDIES

Satellite filing and co-ordination

Aegis is currently filing a new satellite system with the ITU Radiocommunications Bureau on behalf of a client. Using ITU-R software packages (SpaceQry, Mspaceg, SpaceCap, SpacePub and GIMS) we have been:

- analysing ITU-R space databases with a view to identifying potential orbital slots
- performing compatibility analyses to determine the impact of interference on other geostationary networks
- generating parameter lists for electronic advance publication and co-ordination submissions.

It is anticipated that further support will be provided during any co-ordination negotiations that are likely to arise.