



Australian Government

Department of Defence

Chief Information Officer Group

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Military Spectrum Management Challenges in a Network Enabled Battlespace

Colonel Lewis Coyle, Director Defence Spectrum Office





Scope of Presentation

- About the Defence Spectrum Office
- Spectrum Management Policy/Forums
- Spectrum Supportability Processes
- Regulatory Environment
- Why do we need Spectrum?
- Challenges
- WRC-11



Where is the Defence Spectrum Office?

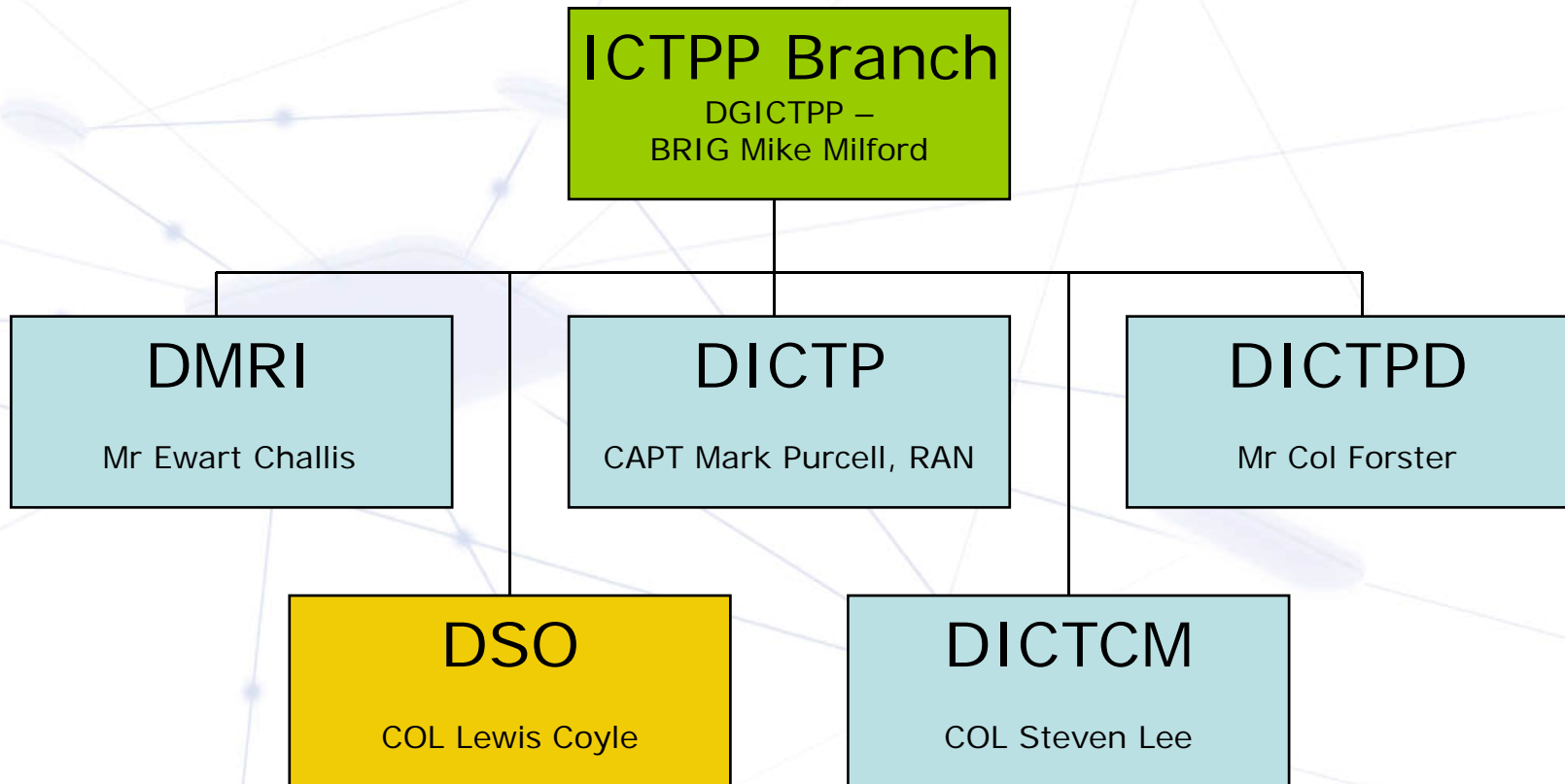
- Chief Information Officer Group
(CIO – Mr Greg Farr)

Information Communications & Technology
Operations Division
(HICTO – RADM Peter Jones) (Strategic J6)

ICT Policy and Plans Branch
(DGICTPP – BRIG Mike Milford)



Structure of ICTPP Branch





Defence Spectrum Office

- Restructured in April 2008
- DSO's responsibilities include:
 - Spectrum planning and management,
 - Spectrum policy and tools development,
 - Radio frequency assignment, and
 - Satellite coordination, for:
 - Department of Defence
 - Australian Defence Force



DSO Structure

- Radio Spectrum Planning team (MRSP – Vacant)
- Spectrum Development team (MSD – Vacant)
- Radio Frequency Assignment team (DDRFA – Mr Ron Sharp)
- Satellite Coordination team (MDSC - Mr Darrell Ninham)
- Total 16 positions; 12 currently filled; one uniform.



Radio Spectrum Planning Team

- 5 staff
- Short and long term planning of Defence use of the RF spectrum
 - Monitor Regulatory Environment
 - Plan and manage Defence use of the RF spectrum
 - Process applications for Spectrum Support
- Domestic and International Work
 - Close relationship with the ACMA & other stakeholders
 - Various Australian spectrum WG
 - ITU, CCEB SWG, JTIDS MNWG , etc
- Provide policy advice to projects on spectrum issues



Spectrum Development Team

- 2 staff
- Produce the Australian Defence Spectrum Strategic Plan (ADSSP)
- Maintain Defence policy in relation to Spectrum Management
- Sponsor spectrum management tools for the Australian Defence Organisation, eg SATURN
- Develop procedural matters in relation to spectrum management (MOU with ACMA)
- Note: Currently vacant



Radio Frequency Assigning Team

- 3 staff
- Responsible for frequency assignments and licensing of defence systems, & deals with:
 - Internal Military Organisations
 - External Military Organisations
 - External Agencies
- Frequency Assignment Transactions
- Frequency Assignment Requests
- Involved in planning for Joint and Combined Exercises (this week attending EX Talisman Saber 2009 MPC)



Satellite Coordination Team

- 4 staff
- File, coordinate and protect Defence Satellite orbital positions
- Participate in national and international forums to ensure protection of our satellite capability and spectrum (ARSG, APT, ITU)
- Conduit to the National Regulator (ACMA) on satellite matters



Spectrum Management Policy/Forums

- Within the ADO
 - ADFP 6.0.4 / DI(G) OPS 7-14 / ADSSP
 - CIOG/DMO/DSTO/CDG/Services
- National Work
 - ARSP / Band Plans / Spectrum Licenses / Embargos / RALIs
 - Close relationship with the ACMA & other stakeholders
 - ACMA Reviews/Discussion Papers
 - RCC, DSLC, IRAC WRC PG, ARSGs, WRC AI Coordination Groups, Aviation Spectrum Group
 - Govt groups: NCCGR, AGRWG, LESRSC, etc
- International Work
 - Military
 - CCEB SWG, JTIDS MNWG, US Defence Spectrum Summit
 - Civilian
 - WRC-11, ITU-R SG & SG WPs, APG, AWF, APT



Spectrum Supportability Processes

- Within Australia
 - Requirement to seek spectrum supportability advice
DI(G) OPS 7-14
 - Submission of AA763 form (Equipment Supportability Request)
Ideally before Commonwealth commits to procurement
 - Equipment entered into SATURN Spectrum Management Tool
 - Advice given on Spectrum requirements, including any restrictions for use within Australia
- Within CCEB Nations
 - Exchange of information using CCEB equipment supportability formats (CF299 and CFAL) - data stored on SATURN
 - Existing CFAL and CF299 process being suspended (possibility of joining NATO supportability process)



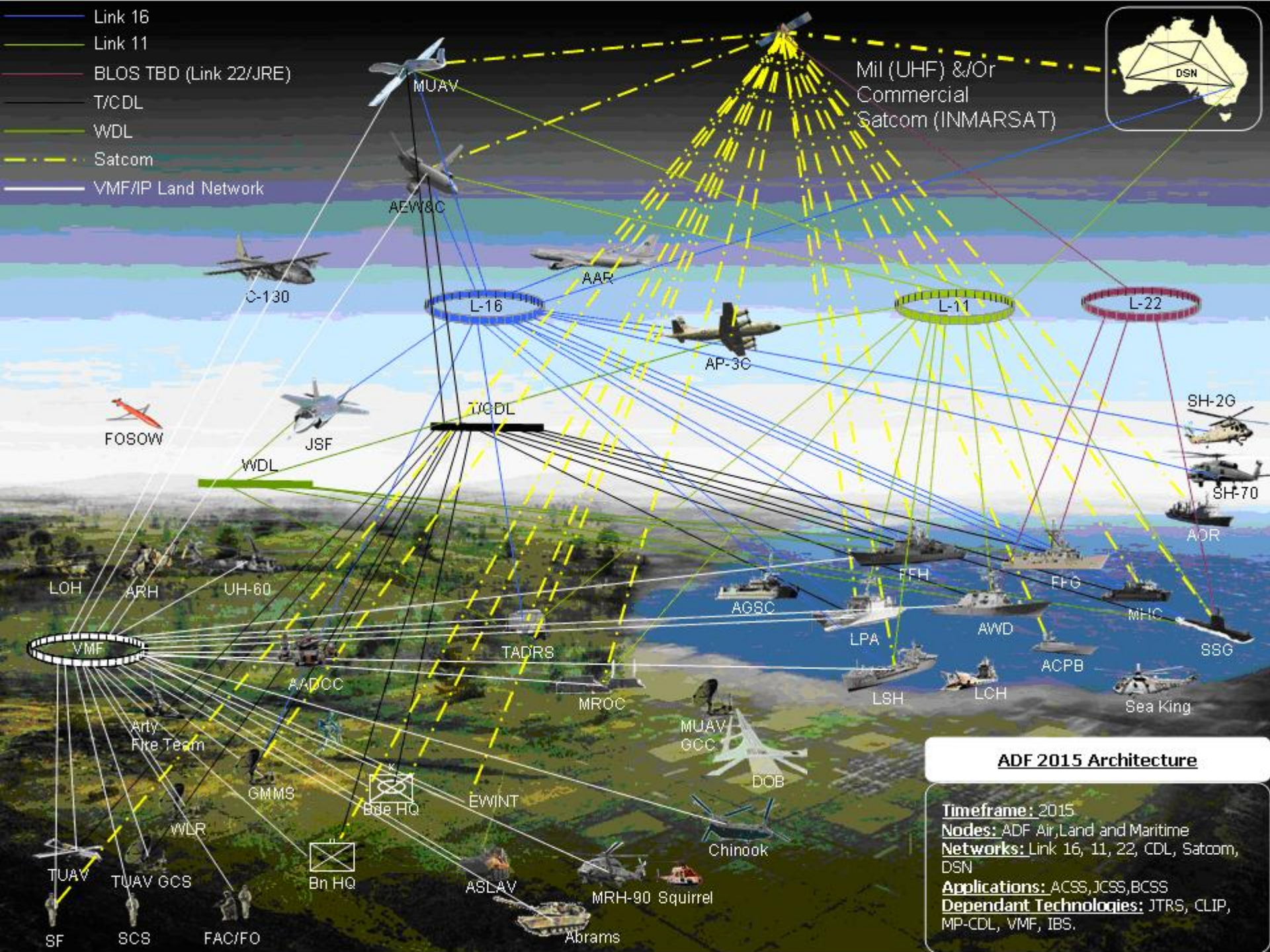
Regulatory Environment

- Radiocommunications Act 1992
- Requires all use of the spectrum to be licensed through:
 - Class licences
 - Spectrum Licences
 - Apparatus Licences
- The Act provides minimal privileges to Defence, except in emergency
- Australian Radiofrequency Spectrum Plan (ARSP)
 - has Footnotes which specify that some bands, or services operating in a band, are to be used principally for the purposes of defence
 - other FNs relate to sharing of certain bands with Defence
- ACMA is the Regulator



Why do we need Spectrum?

- Defence requires access to the RF spectrum
 - for the conduct of modern military operations
 - for activities in support of operations (systems for communications, tactical data links, radars, satellite, electronic warfare and telemetry)
 - When we need spectrum, we need it now
- Developments in technologies are
 - increasing demand for spectrum for commercial applications
 - increasing pressure on Defence to share spectrum
 - Increasing military demand for high speed and reliable information for situational awareness and NCW



- Link 16
- Link 11
- BLOS TBD (Link 22/JRE)
- T/CDL
- WDL
- Satcom
- VMF/IP Land Network



Mil (UHF) &/Or
Commercial
Satcom (INMARSAT)

ADF 2015 Architecture

Timeframe: 2015
Nodes: ADF Air, Land and Maritime
Networks: Link 16, 11, 22, CDL, Satcom, DSN
Applications: ACSS, ICSS, BCSS
Dependant Technologies: JTRS, CLIP, MP-CDL, VMF, IBS.



Challenges

- Staffing
 - Critical employment category recognition
 - Demands on staff increasing/complexity of tasks
 - Proposed new structure being developed
- Competition for Spectrum
 - Not just Defence going Network-enabled
 - Increased demand by consumers, industry, OGOs
 - Continuous battle to retain and gain spectrum
 - ACMA Discussion papers and responses
- Funding
 - Defence pay ACMA \$11m for spectrum license fees
 - Potential for large increase in fees charged



More Challenges

- Support to Military Operations & Training
 - Highest priority task
 - New Battlefield Spectrum Management tool
 - Need staff and time for spectrum planning and analysis
- DCP Projects
 - Projects expect Spectrum advice and support
 - Many big projects at critical stage for spectrum support
 - Need to explore alternative options for professional support
- Capabilities introduced without Spectrum advice
 - Must consult DSO for spectrum supportability advice



Even More Challenges

- Threats to Defence Spectrum:
 - IRGSH Paper
 - ‘400 MHz Band’ RCC Working Group
 - Numerous Defence bands desired by others
- Software Defined Radio / Cognitive Radio
- Extensive Defence Spectrum Audit
- Digital Audio Broadcast Trial 230-240 MHz
- CDL/TCDL C2 uplink
- Licensing of threat emitters
- Wide area surveillance data links
- CIED developments
- “Unsupportable” micro/mini UAVs



WRC-11 Campaign Plan

- Approximately three years left to perform relevant studies toward WRC 2011
- 25 Agenda Items for the next WRC
- More than half of high interest to Defence
- Need to develop a campaign on a number of Agenda Items to ensure full exposure to Defence community
- SG4 and SG5 met recently in Geneva
- Defence WRC-11 Campaign Plan being formulated



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Questions ?