Spectrum Architecture & Standards

Mr. Martin Westphal
Vice Director, JS J6
“Well, lemme think. ... You’ve stumped me, son. Most folks only wanna know how to go the other way.”
The Future Operating Environment

Austere Conditions, ranging from Permissive to Anti-Access C4/Cyber Environments

Phase Zero

Permissive

Contested

Anti-Access
Commanders need ability to establish and maintain joint force freedom of action in an increasingly complex electromagnetic environment.
JCIDS Streamlining Efforts

- Consolidated four instructions into two and JCIDS Manual
- Mandated shorter document lengths
- Streamlined joint staff procedures and timelines by 50% to increase effectiveness and responsiveness of the requirements development process.
What’s Needed!
Mission Based Integrated Architectures

- Professionalize Cap Dev Corps (GS)
- Non-Materiel/Materiel Integration & Institutionalization

**Assessment**

- Capability Development
  - WF Concept/CONOPs/CONEMP
  - “Mission” Architectures (e.g. JACAS)
  - Operational (To Be)
  - “As Is” Architecture

**Gaps?**

- Migratory Architecture
  - Gaps
  - JCIDS Doc

**DOTE / JTIC**

- Materiel/Non-Materiel Integrated Certification
  - (Architecture Based)

- Best Industry Practices
  - Tech Approved Standards
  - IEMs
  - (PM is Responsible)

- CIO
  - Policy
  - Data Standards

- Systems Architecture (AT&L)
  - Technical Architecture (DISA / CIO)
  - Services (ACAT 3/4 Programs)

- Evaluation of Alternatives (EOA)
  - Analysis of Alternatives (AOA)

- POM
  - First 2 yrs
  - Remaining 3 yrs

- Current (COTs/GOTs)
  - Projected (w/in 2 yrs)
  - Long Term (over FYDP)
    - DARPA / Labs

**Research “X” Time**

**System / Technical Architecture Views**
Solution(?)

Executable Architecture Simulation Model (ExAM)

- Identify
  - Gaps
  - Redundancies
  - Duplicities
  - Deficiencies
  - Restrictions

- Determine (DOTMLPF-P)
  - Doctrine
  - Organization
  - Training
  - Materiel
  - Leadership
  - Personnel
  - Facilities
  - Policy
QUESTIONS?
Back-ups
Defense Spectrum Management
Assuring Global Spectrum Access

SATCOM, Precision Navigation & Timing

Spectrum Monitoring

Tracking Telemetry & Control

RADAR Operations

Surveillance

Communications

Data Links

Electronic Warfare

Strategic SM Planning

Influencing Capabilities Development & Acquisition

Spectrum Management Operations

Net-Centric SM Support Services

Defense Information Enterprise

GEMSIS Services

Data Services

Training & Education

Analytical Services

Tools & Software

Capabilities Development

Net-Centric SM Support Services

International

Allied, Coalition, NGO

High Level Operational Context

DSMA OV-1

National

Intra-government, State, Local, Commercial
CV1 Defense Spectrum Management of the Future

Desired Outcomes

Real-time SM at the tactical edge

Net-Centric SM Services

Critical Enablers

Operational Spectrum Planning
Assignments/Allotments
Digital Spectrum Policy Generation

Spectrum Visualization
E3 Risk Assessment

Modeling & Simulation
Education & Training

Spectrum
Supportability Risk Analysis

Interference Analysis & Resolution

HN Coordination
Spectrum Sharing

Governance
Spectrum Capabilities Development

Authoritative Data
Advanced Technologies
Policy Based SM
Shared Spectrum Situational Awareness
For definitions of operational activities refer to the AV-2
The symbol ●●● Indicates that there are child diagrams
For a more extensive decomposition of operational activities, refer to the spreadsheet version of this product.
A1 Conduct Strategic Spectrum Management Planning

- A1.1 Determine DoD Spectrum Requirements
  - A1.1.1 Develop and maintain a process for capturing DoD SM requirements
  - A1.1.2 Assess current operational spectrum requirements
  - A1.1.3 Project future spectrum requirements
- A1.2 Assess New Technologies
  - A1.2.1 Survey Academia/industry for emerging spectrum-related technologies
  - A1.2.3 Analyze new technology relative to DoD future systems/operations
  - A1.2.4 Identify required Spectrum Regulations/Policy/Plans to adopt new technology
- A1.3 Develop SM Strategic Plans
  - A1.3.1 Maintain DSM Architecture
- A1.4 Establish DoD Policies
  - A1.4.1 Collect policy requirements and inputs
  - A1.4.2 Develop and coordinate policy options
  - A1.4.3 Obtain approval and promulgate
- A1.5 Influence Spectrum Regulations
  - A1.5.1 Monitor for proposed changes of interest to DoD
  - A1.5.2 Develop DoD positions on regulatory changes
  - A1.5.3 Provide DoD inputs to National SM fora
  - A1.5.4 Provide DoD inputs to International SM fora
  - A1.5.5 Informal coordination for support of DoD positions

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A2 Influence Capabilities Development and Acquisition

A2.1 Assess Spectrum Supportability
- A2.1.1 Document SDS Technical Information
- A2.1.2 Assess EMC for Supportability
- A2.1.3 Obtain US Equipment Certification
- A2.1.4 Obtain Host Nation/Allied Supportability Comments
- A2.1.5 Prepare and provide MCEB Guidance

A2.2 Assess E3 Risks
- A2.2.1 Apply interface standards such as MIL-STD-461 and MIL-STD-464
- A2.2.2 Conduct E3 Test and Evaluation
- A2.2.3 Determine E3 risks and recommend mitigation measures

A2.3 Influence SDS Program Decisions
- A2.3.1 Review and provide input to JCIDS/Acquisition Documents
- A2.3.2 Oversee compliance with MCEB Guidance

A2.4 Register Satellites
- A2.4.1 Submit Advance Publication Information
- A2.4.2 Coordinate with affected host nations
- A2.4.3 Verify ITU Notification in MIFR
- Provide Satellite Operating Status

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A2 Influence Capabilities Development and Acquisition

- **A2.1 Assess Spectrum Supportability Risks**
  - A2.11 Document SDS Technical Information
  - A2.12 Analyze EMC within Planned Operational Environment
  - A2.13 Assess E3 risks against design parameters
  - A2.14 Respond to foreign nation coordination requests

- **A2.2 Obtain spectrum supportability approval**
  - A2.21 Obtain US equipment certification
  - A2.22 Obtain Host Nation/Allied Supportability Comments
  - A2.23 Obtain supportability approval from Joint Staff
  - A2.24 Prepare and provide MCEB Guidance

- **A2.3 Influence SDS Program Decisions**
  - A2.31 Review and provide input to JCIDS/Acquisition documents
  - A2.32 Collaborate with and advise program offices
  - A2.33 Oversee compliance with MCEB Guidance
  - A2.34 Provide design support and E-3 testing

- **A2.4 Register Satellites**
  - A2.41 Submit Advance Publication Information
  - A2.42 Coordinate with affected host nations
  - A2.43 Verify ITU Notification in MIFR
  - A2.44 Provide Satellite Operating Status

- **Activity boxes that have changed from the previous epoch are in bold**
- **For definitions of operational activities refer to the AV-2**
A3 Perform Spectrum Management Operations

- A3.1 Plan Spectrum Use
  - A3.11 Develop Operational SM Policy and Guidance
  - A3.12 Define Operational Spectrum Requirements
  - A3.13 Assess Electromagnetic Battlespace (EMB)
  - A3.14 Obtain Spectrum Resources
  - A3.15 Deconflict Planned Spectrum Use

- A3.2 Provide Spectrum Authorization
  - A3.21 Publish Allotment Plans
  - A3.22 Nominate and Assign Frequencies

- A3.3 Use EM Spectrum
  - A3.31 Transmitting
  - A3.32 Receiving
  - A3.33 Generate JCEOI

- A3.4 Respond to Electromagnetic Interference (EMI)
  - A3.41 Characterize EMI
  - A3.42 Perform EMI Resolution Activities
  - A3.43 Report EMI

For definitions of operational activities refer to the AV-2
A3 Perform Spectrum Management Operations

- A3.1 Plan Spectrum Use
  - A3.11 Develop Operational SM Policy and Guidance
  - A3.12 Define Operational System Requirements
  - A3.13 Assess Electromagnetic Battlespace (EMB)
  - A3.14 Obtain Spectrum Resources
  - A3.15 Deconflict Planned Spectrum Use

- A3.2 Provide Spectrum Authorization
  - A3.21 Publish Allotment Plans
  - A3.22 Nominate and Assign Frequencies
  - A3.23 Generate JCEOI

- A3.3 Use EM Spectrum
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  - A3.32 Receiving

- A3.4 Respond to Interference
  - A3.41 Characterize EMI
  - A3.42 Perform EMI Resolution Activities
  - A3.43 Report EMI

- A3.5 Provide Digital Spectrum Policies
  - A3.51 Generate Digital Spectrum Policies
  - A3.52 Disseminate Digital Spectrum Policies

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