AESOP 3.0 Highlights

Afloat Electromagnetic Spectrum Operations Program

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What is it?

NAVSEA WARFARE CENTERS DAHLGREN

A Comprehensive Integrated Afloat Spectrum Planning Tool

- ✓ Radar and Combat System Frequency Planning
- ✓ Communications Planning
- ✓ Minimizes EMI Among ALL Afloat Emitters
- ✓ Automated Information Flow of Spectrum Planning
- ✓ Automated Frequency Assignment Generation
- ✓ Analysis of EMI Involving SG and Shore Based Emitters
- ✓ Complete Deployment Frequency Plans and Operational Guidance
- ✓ Compliant with Navy Certification and Messaging Standards
- ✓ Version 2.1 delivered in October 2008

Mandated by ALCOM 33/05, ALSECONDFLT 18/04 / ALTHIRDFLT 06/04

Spectrum Planning Tools

NAVSEA WARFARE CENTERS
DAHLGREN

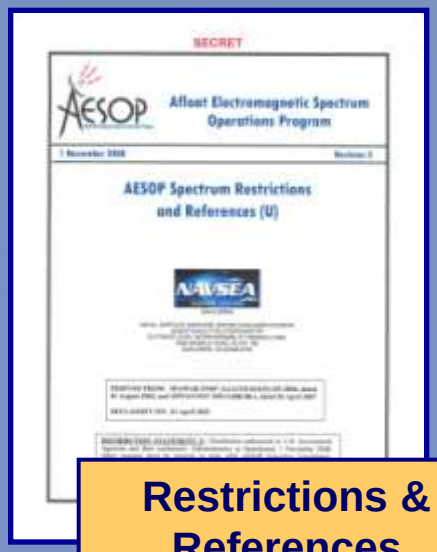
AESOP Team

OP-3840 Technical Manual and Appendix F

Update!
Check the SIPR website for updates to the Database, OP-3840 Appendix F, and Standing Plans.

AESOP Software

Spectrum Planning Guide



Restrictions & References

AESOP Info Sheet

Ship Card

SIPR Web Site *Resource Updates*

UNCLASSIFIED

AESOP 3.0 New Features

NAVSEA WARFARE CENTERS DAHLGREN

Afloat Electromagnetic Spectrum Operations Program

- ✓ Database Update Tool
- ✓ Positions of Intended Movement (PIMs)
- ✓ Joint Restricted Frequency List (JRFL)
  MCEB Pub 8, Version 2.0.1 (1 July 2010); Tactical Information - JRFL
- ✓ Enhanced Mapping Capability
  2-D and 3-D maps with Digital Terrain Elevation Data (DTED)
- ✓ Enhanced Radar Coverage Plots
- ✓ Comm Link and Net Connectivity Analysis
- ✓ Net View and Planning Board Graphics Enhancements
- ✓ Database Updates (Radar & Comm Equipment, Fourth Fleet AOR, CREW devices, Trucks, Manpacks, and UAVs)
- ✓ Expanded Net Restoral Plan
- ✓ Updated Standing Communications Plans (Commercial Broadband Satellite Program (CBSP) usage and SATCOM downlink, uplink, and rider usage, emission designator encrypted/unencrypted info)
- ✓ TACAN Scheduler

AESOP 3.0 Spectrum Planning Component

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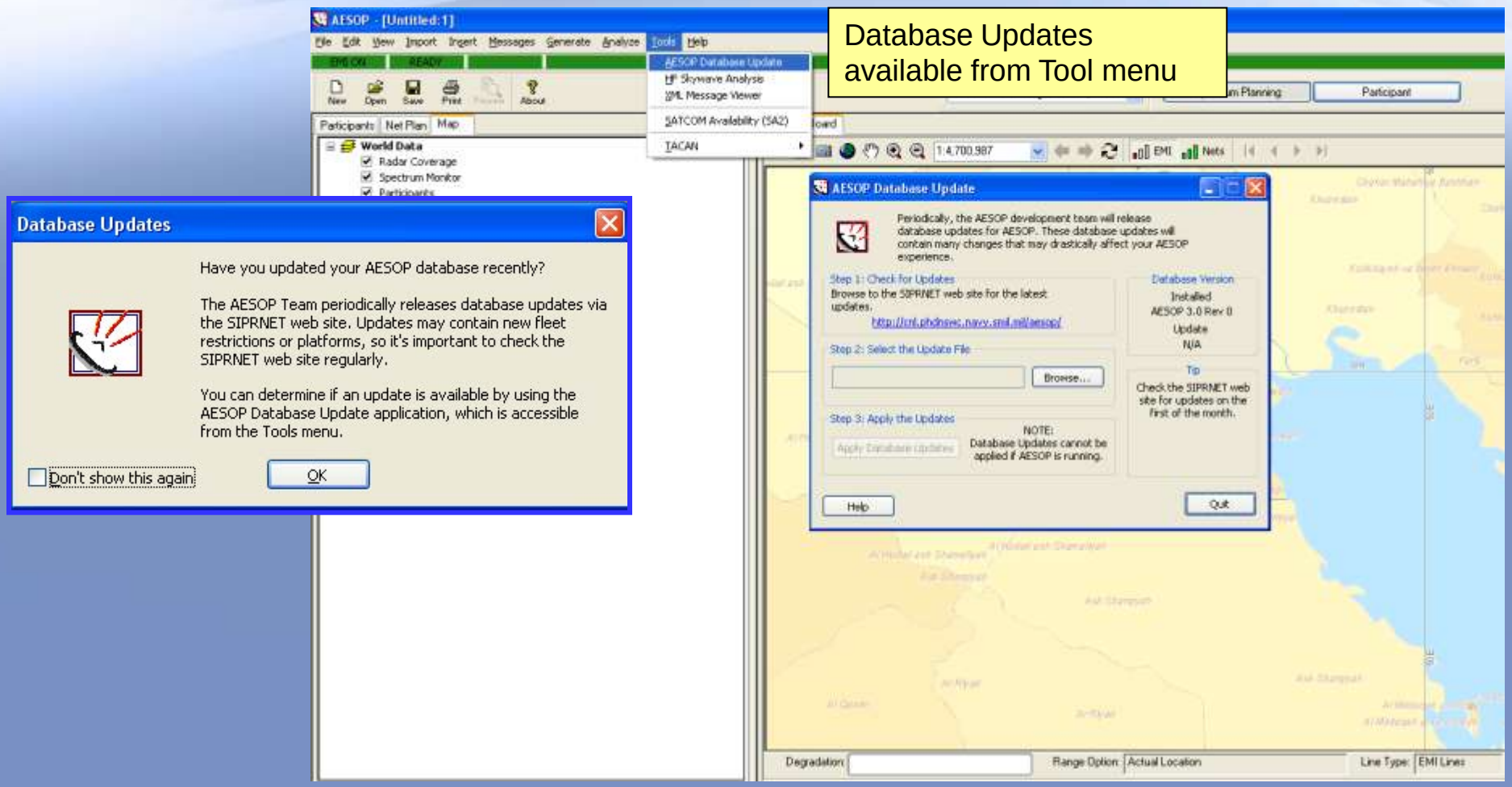
AESOP 3.0 prompts the user to check the SIPR website for database updates



AESOP 3.0 Spectrum Planning Component

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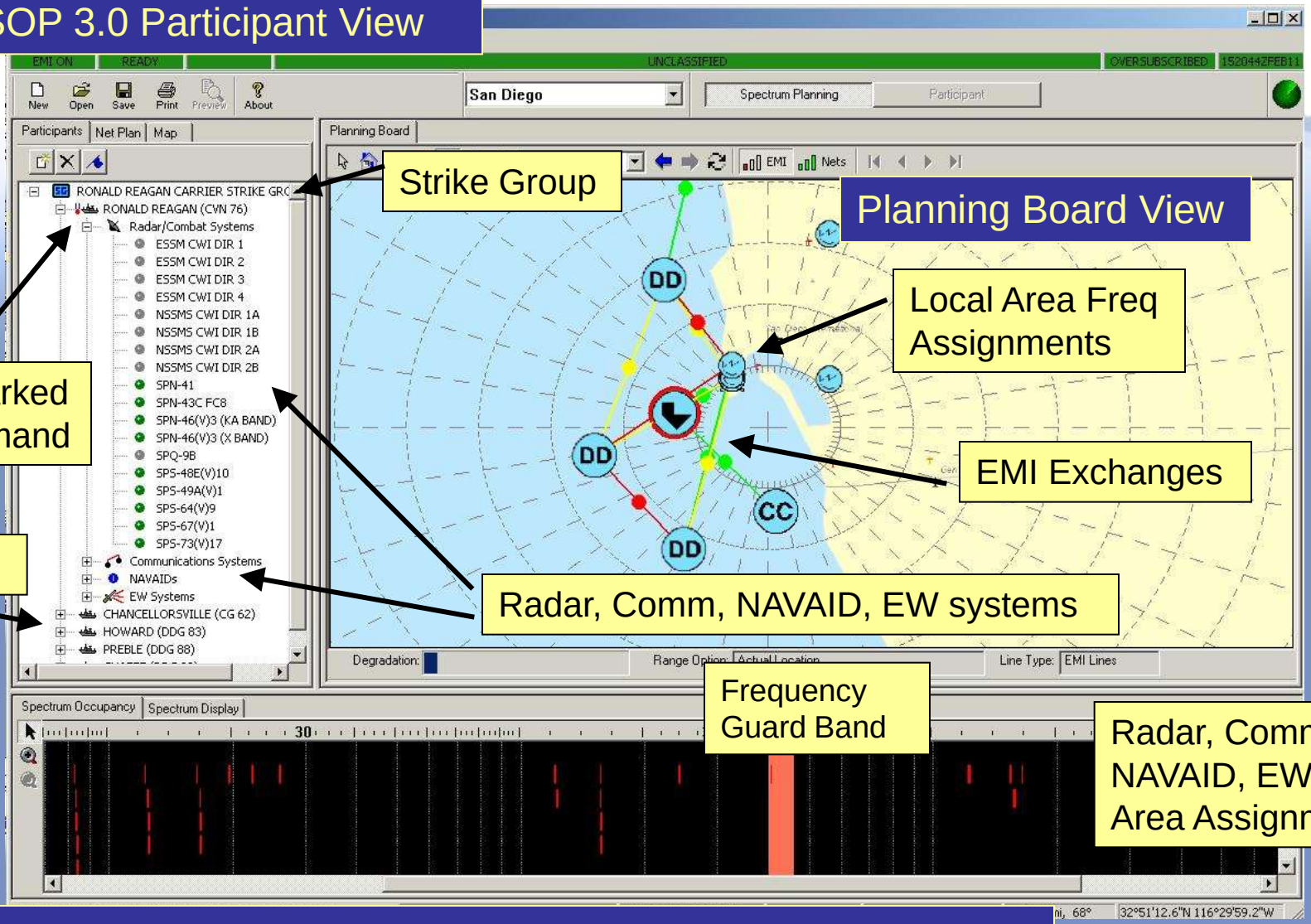
AESOP 3.0 Participant View



AESOP 3.0 Spectrum Occupancy View with International Taboo List Frequencies

AESOP 3.0 Spectrum Planning Component

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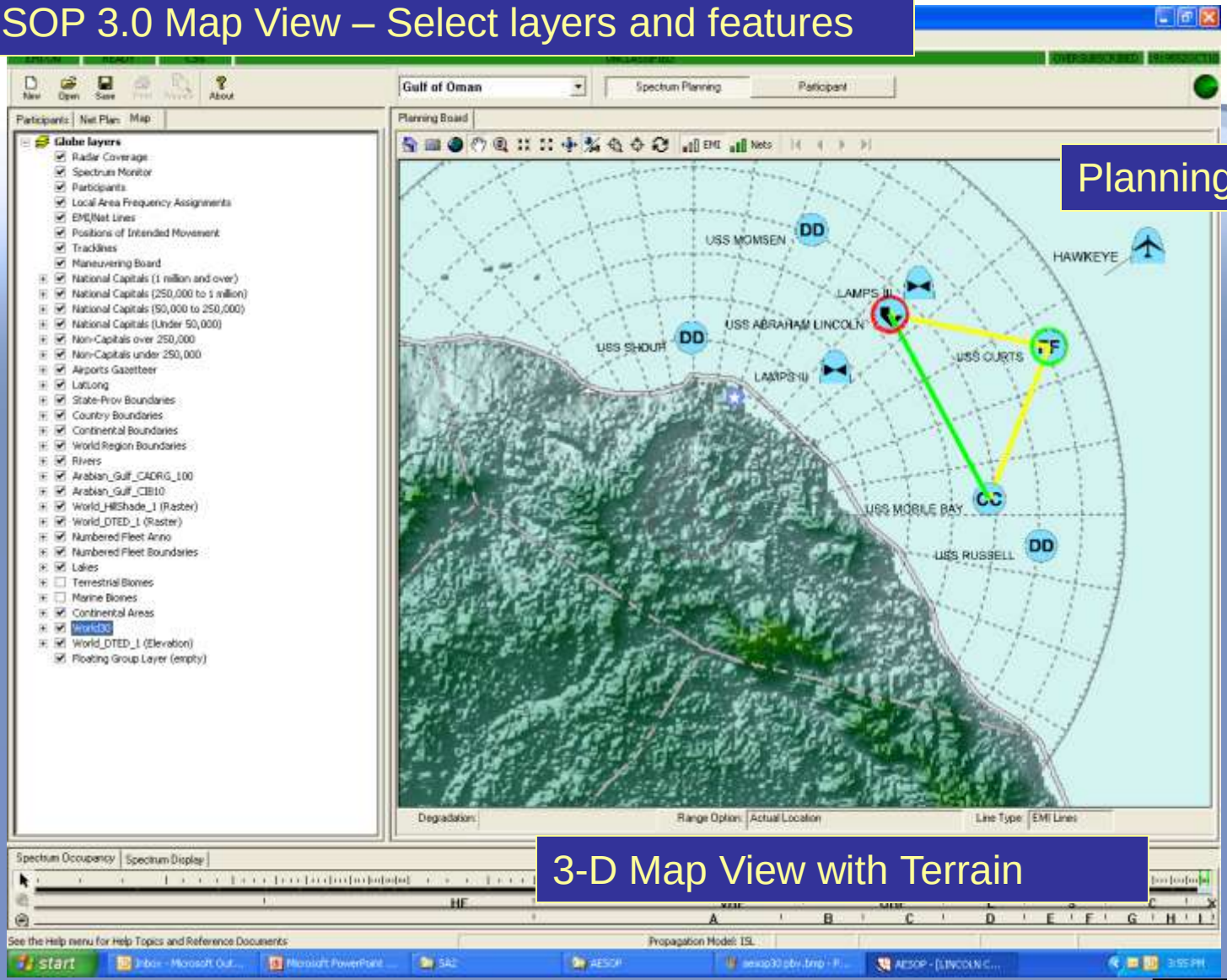
AESOP 3.0 Map View – Select layers and features



AESOP 3.0 Spectrum Planning Component

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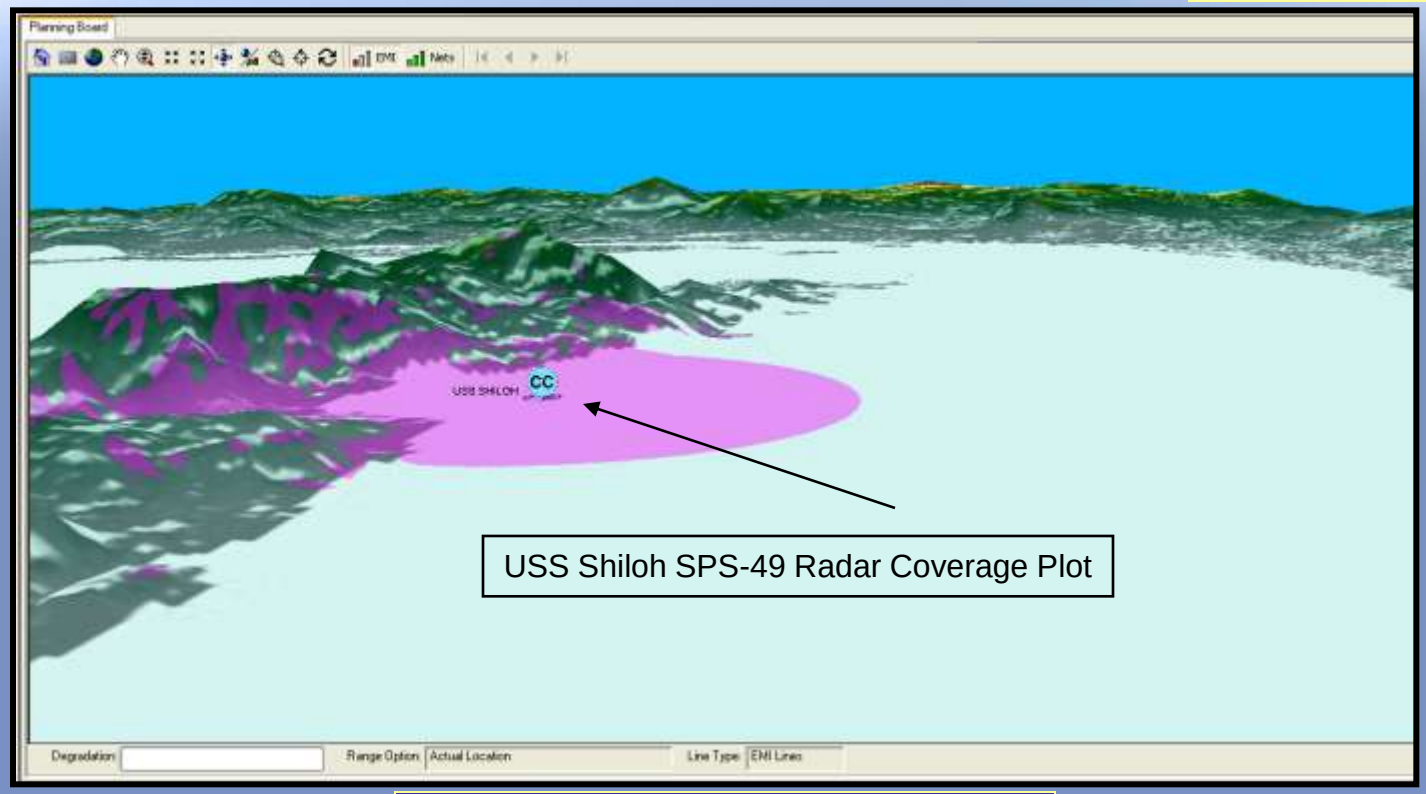
Map View

AESOP 3.0 Draped Radar Coverage Plot using Advanced Propagation Model (APM) and DTED data

Planning Board View



USS Shiloh SPS-49 Radar Coverage Plot

3-D Map View with Terrain

AESOP 3.0 Spectrum Planning Component

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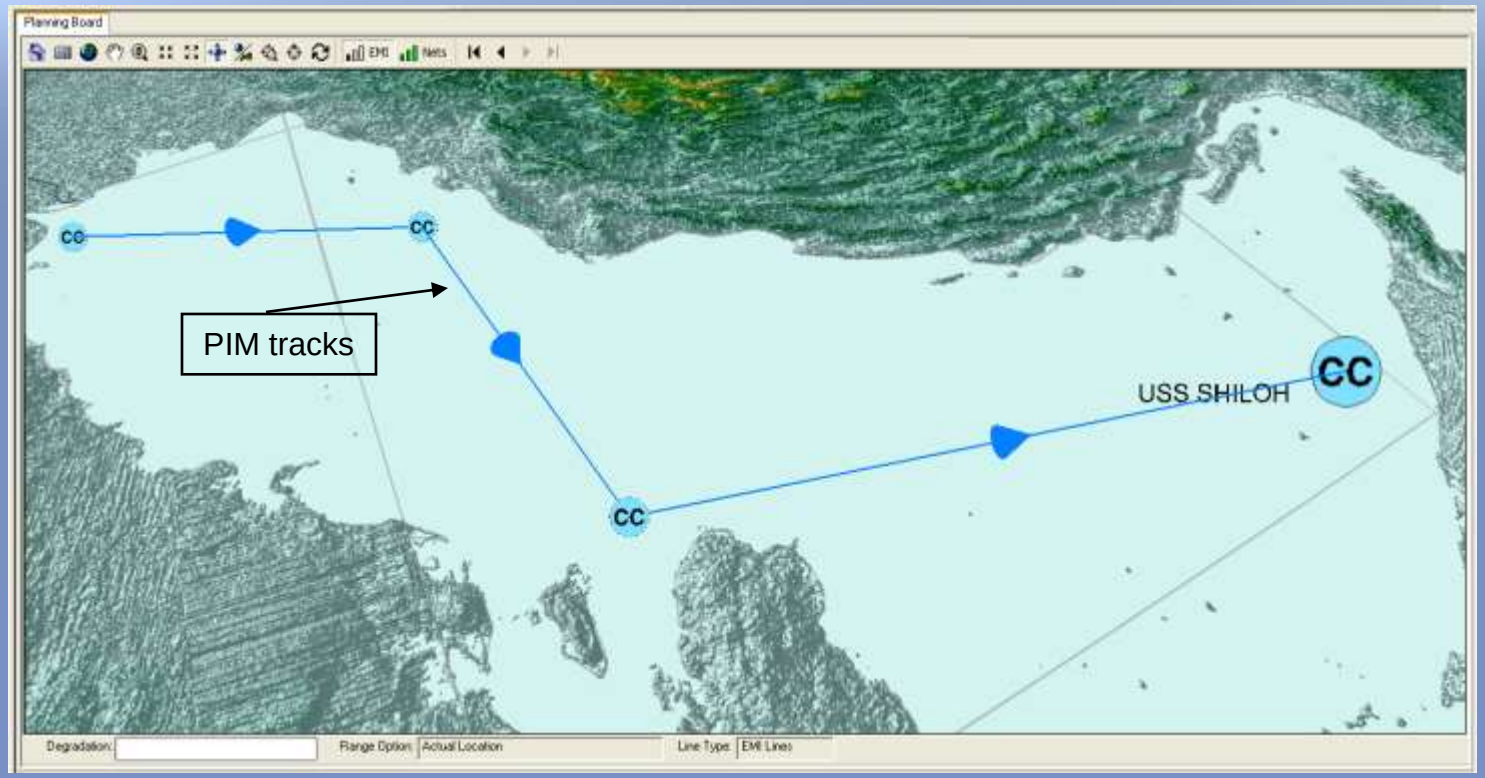
AESOP 3.0 Position of Intended Movement (PIM) Tracks

Planning Board View



3-D Map View with Terrain

AESOP 3.0 Spectrum Planning Component

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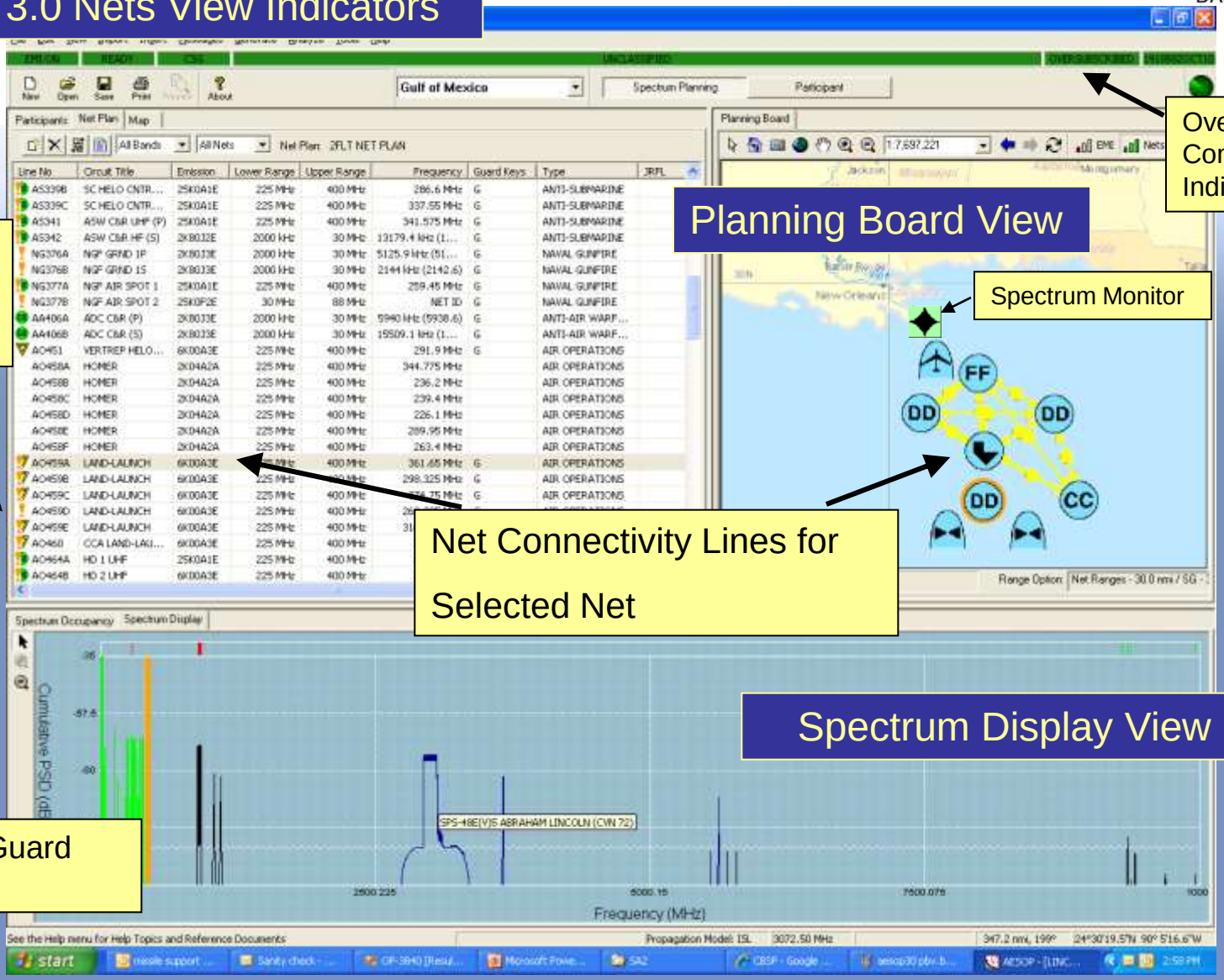
AESOP 3.0 Nets View Indicators



Oversubscribed Comm Net Indicator

Oversubscribed Comm Net and Net Connectivity Indicators

Planning Board View

Net Connectivity Lines for Selected Net

Spectrum Display View

Frequency Guard Band

AESOP 3.0 Spectrum Planning Component

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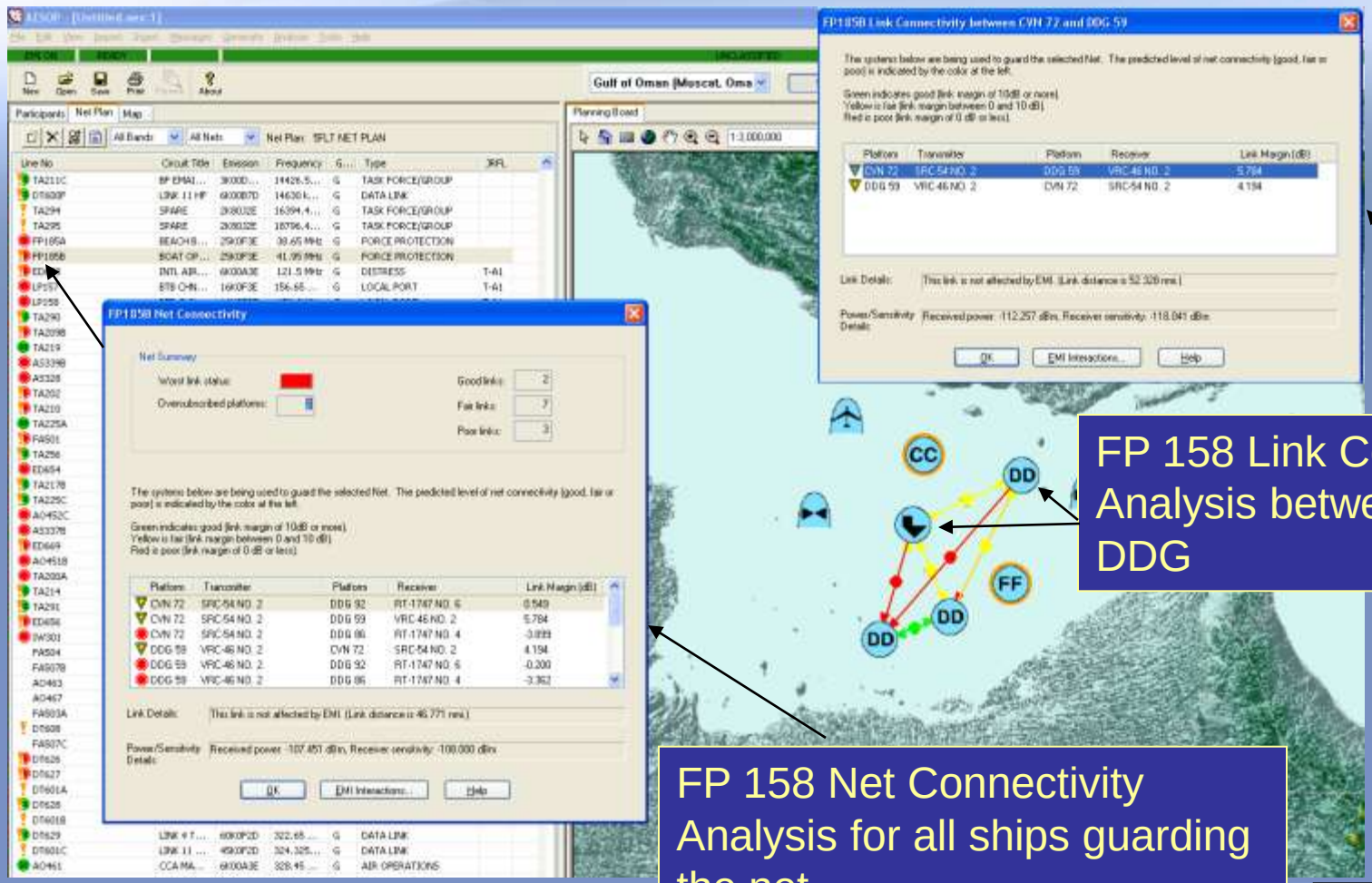
AESOP 3.0 Net View – Net and Link Analysis



AESOP 3.0 Spectrum Planning Component

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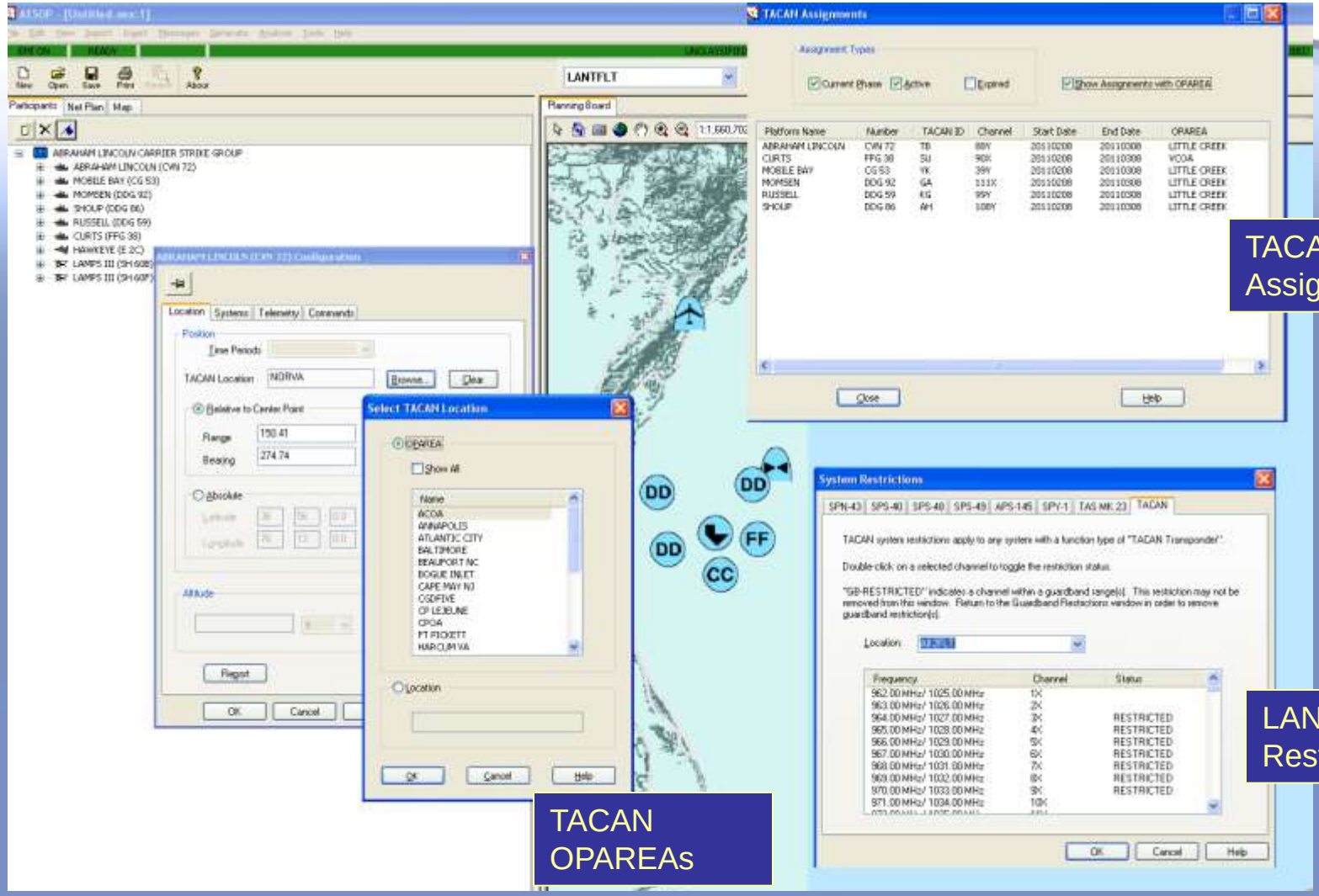
AESOP 3.0 Net View – TACAN Scheduler



AESOP 3.0 Common Operational Spectrum Report

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AESOP 3.0 includes Joint Restricted Frequency List (JRFL) frequencies

Microsoft Excel - COS Report Gulf of Oman.xls

	A	B	C	D	E	F	G	H
1	UNCLASSIFIED							
2	NAVY JRFL FREQUENCIES							
3	Protection Code	Priority	Identifier	Description	Frequency	Status	Justification	Type
4	Taboo	A1	LP157	BTB CHNL-13	156.65 MHz	Approved	International Taboo Frequency List	Net
5	Taboo	A1	LP158	BTB CHNL-16	156.8 MHz	Approved	International Taboo Frequency List	Net
6	Taboo	A1	ED651	INT DISTRESS-CALLING	2183.4 kHz (2182)	Approved	International Taboo Frequency List	Net
7	Taboo	A1	ED653	INTL AIR DISTRESS	121.5 MHz	Approved	International Taboo Frequency List	Net
8	Taboo	A1	ED654	MIL AIR DISTRESS	243 MHz	Approved	International Taboo Frequency List	Net
9	JOINT JRFL FREQUENCIES							
10	Protection Code	Priority	Identifier	Description	Frequency	Status	Justification	Type
11	Taboo	A1		GMDSS/MET AND NAV WARNINGS	490 kHz	Approved	International Taboo Frequency List	ITFL
12	Taboo	A1		GMDSS/NAVTEX/MET AND NAV WARNINGS	518 kHz	Approved	International Taboo Frequency List	ITFL
13	Taboo	A1		INTL DISTRESS/SAFETY	2176 kHz	Approved	International Taboo Frequency List	ITFL
14	Taboo	A1		INTERNATIONAL DISTRESS	2183.4 kHz	Approved	International Taboo Frequency List	ITFL
15	Taboo	A1		INTL DISTRESS/SAFETY	2189 kHz	Approved	International Taboo Frequency List	ITFL
16	Taboo	A1		INTERNATIONAL SAR	3024.4 kHz	Approved	International Taboo Frequency List	ITFL
17	Taboo	A1		INTL DISTRESS/SAFETY	4126.4 kHz	Approved	International Taboo Frequency List	ITFL
18	Taboo	A1		INTL DISTRESS/SAFETY	4179 kHz	Approved	International Taboo Frequency List	ITFL
19	Taboo	A1		INTL DISTRESS/SAFETY	4209 kHz	Approved	International Taboo Frequency List	ITFL
20	Taboo	A1		INTL MARITIME NAV SAFETY	4211.4 kHz	Approved	International Taboo Frequency List	ITFL
21	Taboo	A1		GMDSS/NAVTEX MET AND NAV WARNINGS	4211.5 kHz	Approved	International Taboo Frequency List	ITFL
22	Taboo	A1		INTERNATIONAL SAR	5681.4 kHz	Approved	International Taboo Frequency List	ITFL
23	Taboo	A1		INTERNATIONAL DISTRESS SAFETY	6216.4 kHz	Approved	International Taboo Frequency List	ITFL
24	Taboo	A1		INTL DISTRESS/SAFETY	6269.4 kHz	Approved	International Taboo Frequency List	ITFL
25	Taboo	A1		INTL DISTRESS/SAFETY	6313.4 kHz	Approved	International Taboo Frequency List	ITFL
26	Taboo	A1		INTL MARITIME SAFETY/GMDSS	6316 kHz	Approved	International Taboo Frequency List	ITFL
27	Taboo	A1		INTL DISTRESS/SAFETY	8292.4 kHz	Approved	International Taboo Frequency List	ITFL
28	Taboo	A1		INTL SAR/SURVIVAL CRAFT	8364 kHz	Approved	International Taboo Frequency List	ITFL
29	Taboo	A1		INTL DISTRESS/SAFETY	8378 kHz	Approved	International Taboo Frequency List	ITFL
30	Taboo	A1		INTL DISTRESS/SAFETY	8416 kHz	Approved	International Taboo Frequency List	ITFL
31	Taboo	A1		GMDSS/INTL MARITIME SAFETY	8418.5 kHz	Approved	International Taboo Frequency List	ITFL
32	Taboo	A1		INTL DISTRESS/SAFETY	12291.4 kHz	Approved	International Taboo Frequency List	ITFL
33	Taboo	A1		INTL DISTRESS/SAFETY	12521.4 kHz	Approved	International Taboo Frequency List	ITFL
34	Taboo	A1		INTL DISTRESS/SAFETY	12578.4 kHz	Approved	International Taboo Frequency List	ITFL
35	Taboo	A1		GMDSS/INTL NAVIGATION SAFETY	12581 kHz	Approved	International Taboo Frequency List	ITFL
36	Taboo	A1		INTL DISTRESS/SAFETY	16421.4 kHz	Approved	International Taboo Frequency List	ITFL
37	Taboo	A1		INTL DISTRESS/SAFETY	16696.4 kHz	Approved	International Taboo Frequency List	ITFL
38	Taboo	A1		INTL DISTRESS/SAFETY	16806 kHz	Approved	International Taboo Frequency List	ITFL
39	Taboo	A1		GMDSS/INTL MARITIME SAFETY	16808.5 kHz	Approved	International Taboo Frequency List	ITFL
40	Taboo	A1		GMDSS/INTL MARITIME SAFETY	19682.5 kHz	Approved	International Taboo Frequency List	ITFL
41	Taboo	A1		GMDSS/INTL MARITIME SAFETY	22376 kHz	Approved	International Taboo Frequency List	ITFL
42	Taboo	A1		GMDSS/INTL MARITIME SAFETY	26102.5 kHz	Approved	International Taboo Frequency List	ITFL
43	Taboo	A1		INTL DISTRESS/AERONAUTICAL EMERGENCY	121.5 MHz	Approved	International Taboo Frequency List	ITFL
44	Taboo	A1		INTL DISTRESS/AERONAUTICAL EMERGENCY	123.1 MHz	Approved	International Taboo Frequency List	ITFL
45	Taboo	A1		INTL SHIP/AIRCRAFT SAR	156.3 MHz	Approved	International Taboo Frequency List	ITFL

Spectrum Use Summary | Legend | JRFL | ABE (CVN 72) | CUR (FFG 38) | HAE (E 2C) | ZAS (SH 60B) | LPS (SH 60F

Satellite Availability & Analysis (SA2)

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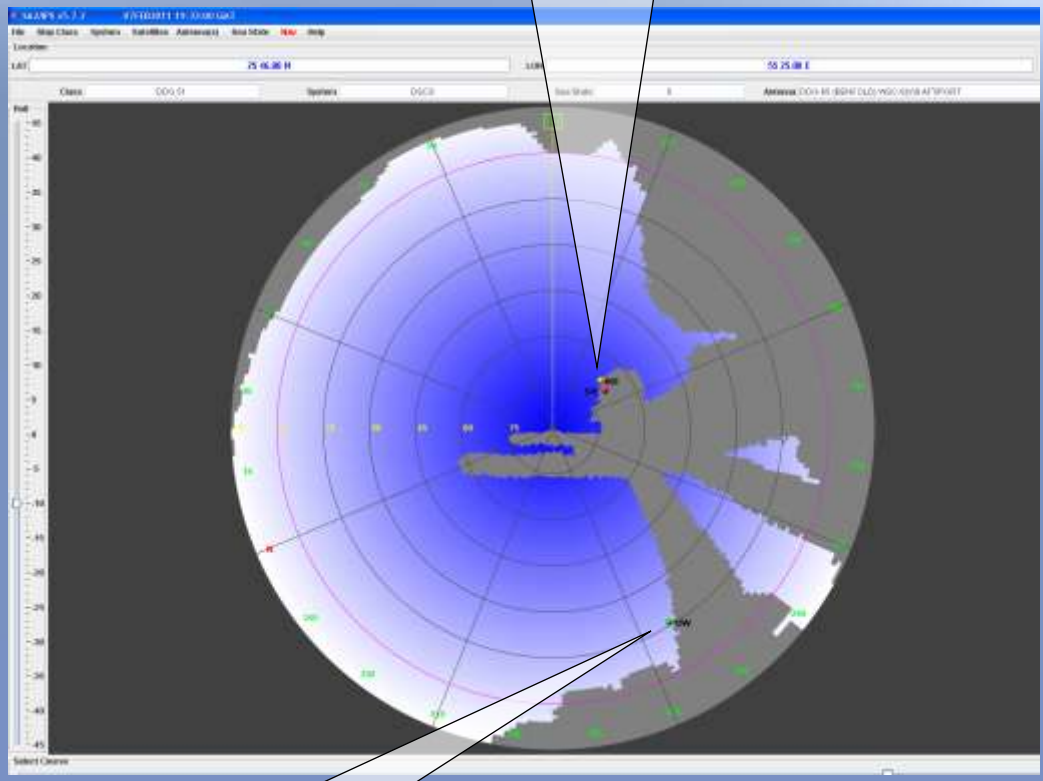
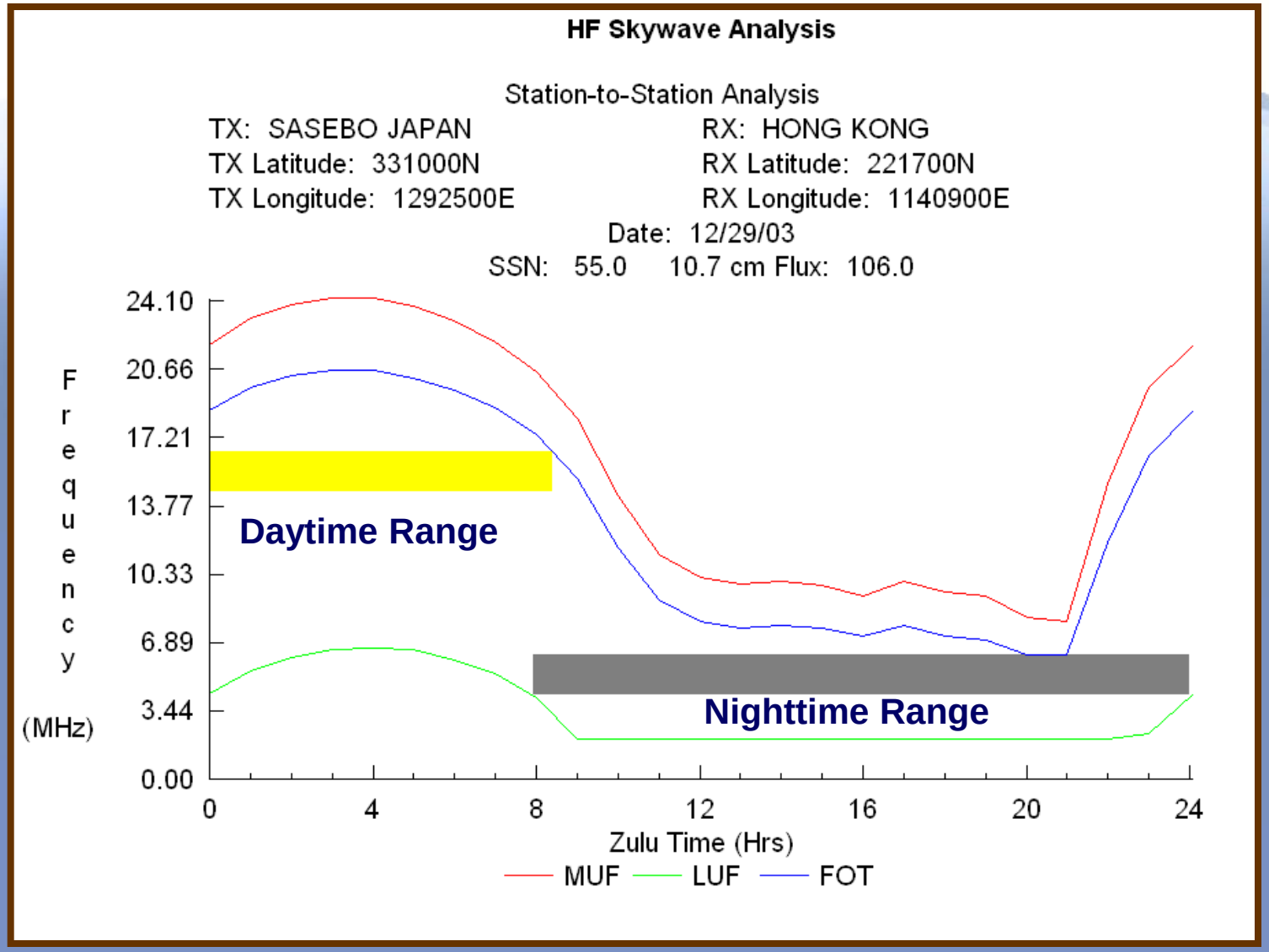
- ✓ AESOP 3.0 – SA2 v5.7.2
- ✓ Software application – situational awareness for SATCOM operators
- ✓ Shows locations of satellites
- ✓ Shows relation of satellites to shipboard structures (masts, cranes, deckhouses, and other antennas)
- ✓ Shows Line Of Sight (LOS) blockage



HF Skywave Analysis



SFAF and SSRF

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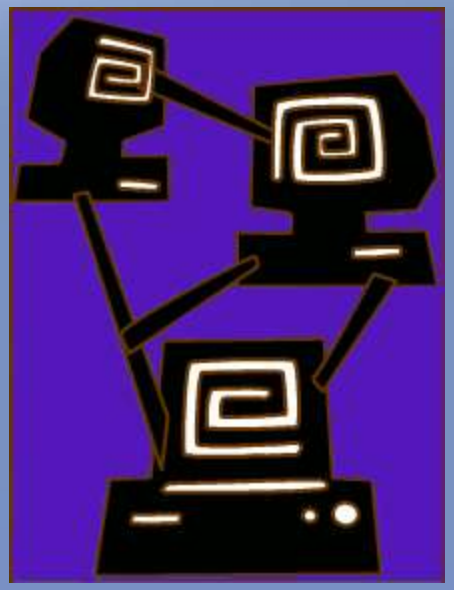
Standard Frequency Action Format (SFAF)

Standard Spectrum Resource Format (SSRF)



- ✓ Joint Interoperability Requirement
- ✓ MCEB Pub 7 (SFAF)
- ✓ MCEB Pub 8 (SSRF)
  - Version 2.0.1 (1 July 2010)
  - Tactical Information - JRFL
- ✓ Standard for DoD Import and Export of Frequency Management Information
  - Government, Civilian, Other DoD Systems
  - Area Frequency Coordinator (AFC)
  - Joint Task Force Commander

AESOP 3.0 Outputs

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Messages

- Communications Planning:
  - Frequency Request
  - OPTASK COMM Plan (XML or GENADMIN)
- Radar Planning:
  - Request
  - Assignment
- Participant:
  - Reply (XML or GENADMIN)
- ***TACAN Assignment and Periodic*** (SFAF or GENADMIN)
- ***JRFL Message (XML – MCEB PUB 8)***

Graphical Displays

- Planning Board View – EMI and Net Connectivity
- Spectrum Occupancy View
- Spectrum Display
- Radar Coverage Plot
- HF SkyWave Analysis
- SA2

Reports

- ***Common Operational Spectrum***
- Assignments
- Comm Nets
- Electromagnetic Environment
- EMI Victims & Interactions
- Engineering Analysis
- Guard Requirements
- IMI Analysis
- Inventory
- Net Prioritization
- Participants
- Phase
- Platform Equipment Inventory
- Platform Position
- Restriction
- Radar and Comm Plans in SFAF
- Spectrum Use
- System Characteristics

Future Plans - AESOP 4.0

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- ✓ MCEB Pub 8 XML Compliance.
  - 3.0 JRFL output already complies with Pub 8.
  - Current SFAF output will be available in Pub 8 format.
- ✓ Net-Centric Application.
  - Web-enabled, thick-client application.
  - Remotely-located database allowing collaboration.
  - Master AESOP database will be deployed ashore, accessible via SIPRNET.
  - AESOP's stand-alone capability will be retained for users without SIPRNET or with limited bandwidth capability.

More Future Plans - AESOP 4.0

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- ✓ Improved Antenna Modeling
  - For improved analysis and visualization capabilities.
  - Users will be able to view and use 2D and 3D antenna pattern data from the database.
- ✓ System Operational Effectiveness Visualization
  - Enhanced radar coverage plots
    - The effects of EMI on target detection,
    - Show a multi-sensor coverage area,
    - Provide a 3D view of radar coverage.
    - Coverage plots for other systems types (communication, NAVAID, and EW) in the presence of EMI.
- ✓ Automated Spectrum Analyzer Interface
  - Interface with a spectrum analyzer
  - Observed signals will be displayed on AESOP's Spectrum Display
  - Will allow comparison of planned spectrum use to actual RF environment.

AESOP 3.0 Highlights

NAVSEA WARFARE CENTERS DAHLGREN

Questions?

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U.S. Navy Compliance

NAVSEA WARFARE CENTERS DAHLGREN

AESOP Version 2.1/3.0

- ✓ System Security Authorization Agreement (SSAA) and Authority To Operate (ATO), 14 APRIL 2009
- ✓ Department of Navy Application and Database Management System (DADMS)
  - 52038
- ✓ Navy-Marine Corps Intranet (NMCI
  - RFS-106579
  - ISF-117477
- ✓ Information Technology for the 21st Century (IT-21)
  - PSC-2009-00076
- ✓ Naval Education and Training Command (NETC) Training Network (TRANET)
  - NETC_N00076_TRANET-C_S
  - NETC_N00076_TRANET_U
- ✓ OCONUS Navy Enterprise Network (ONE-NET)
  - Reference DADMS Number 52038 when calling the ONE-NET Help Desk for installation.

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