**Program Executive Office
Command, Control, Communications,
Computers and Intelligence (PEO C4I)**

Communications Program Office (PMW/A 170)
U.S. Navy Commercial SATCOM Overview

ISCe Conference

June 12, 2008
Kai Tang
SATCOM Division Director

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*Information Dominance;
Anytime, Anywhere…*

Agenda

- Navy Day Schedule
- Commercial SATCOM Overview
- PEO C4I Organization
- Current and Potential Commercial SATCOM
- Navy SATCOM Capability Growth
- Current Satellite Connectivity
- Navy SATCOM Roadmap
- Considerations
- Acquisitions – Lessons Learned
- Acquisitions – Looking Forward
- Closing
- Points of Contact

Navy Schedule

Navy Day Schedule

- Navy Commercial SATCOM Background/Strategy - Kai Tang
- Commercial Broadband Satellite Program (CBSP) - Melinda Ratz
- Shipboard Networks - Kurt Fiscko
- Airborne Networking - Karl Gutekunst
- Navy Expeditionary Combatant Command (NECC) - Kevin Washburn
- Submarine Communications – Mike Hutter
- Acquisition and Fielding of Capability - Kurt Fiscko
- SPAWAR Contracting Process - Karen Rainville

Thursday Noon Keynote Address - CAPT John Pope,
Navy Communications Program Office, PMW/A 170
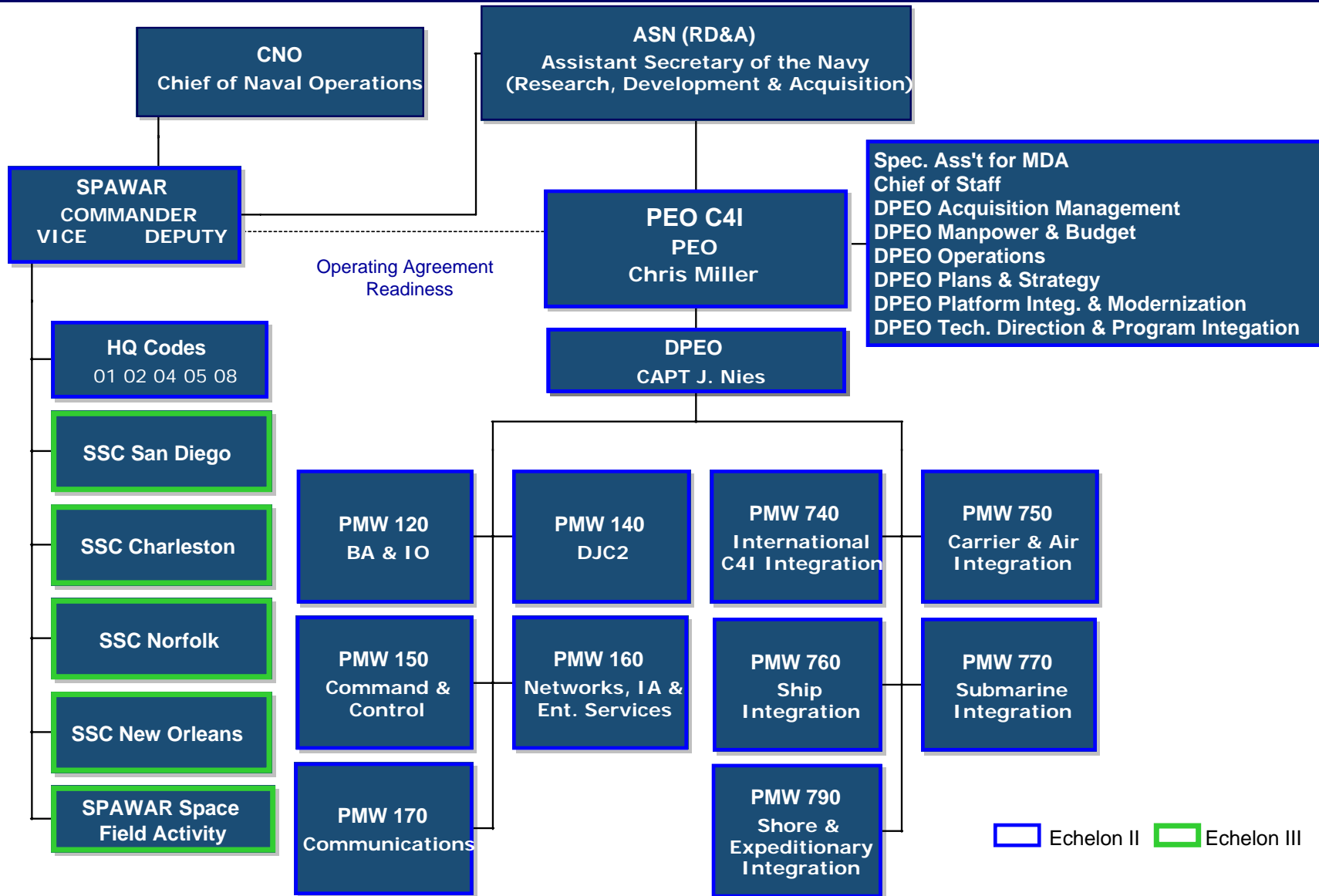
Commercial SATCOM - Overview

- PEO C4I is the single largest DoD customer for Commercial SATCOM
- PEO C4I centrally manages, budgets, and funds Commercial SATCOM as established programs of record
- Roles and Responsibilities:
  - **Office of the Chief of Naval Operations**
    - Requirements Validation and Funding
  - **Program Executive Office, Command, Control, Communications, Computers and Intelligence (PEO C4I), Navy Communications Program Manager (PMW/A 170)**
    - Acquisition
    - Program Management
    - Life Cycle Management
  - **Space and Naval Warfare Systems Command (SPAWAR)**
    - Office of the Chief Engineer
    - Contracts Support
  - **Naval Network Warfare Command (NETWARCOM)**
    - Naval Component Commander to US Strategic Command
      - Operations
      - Requirements Generation

PEO C4I
Organizational Alignment

CNO
Chief of Naval Operations

ASN (RD&A)
Assistant Secretary of the Navy
(Research, Development & Acquisition)

SPAWAR
COMMANDER
VICE   DEPUTY

Operating Agreement
Readiness

PEO C4I
PEO
Chris Miller

Spec. Ass't for MDA
Chief of Staff
DPEO Acquisition Management
DPEO Manpower & Budget
DPEO Operations
DPEO Plans & Strategy
DPEO Platform Integ. & Modernization
DPEO Tech. Direction & Program Integation

HQ Codes
01 02 04 05 08

DPEO
CAPT J. Nies

SSC San Diego

SSC Charleston

SSC Norfolk

SSC New Orleans

SPAWAR Space Field Activity

PMW 120
BA & IO

PMW 140
DJC2

PMW 740
International C4I Integration

PMW 750
Carrier & Air Integration

PMW 150
Command & Control

PMW 160
Networks, IA & Ent. Services

PMW 760
Ship Integration

PMW 770
Submarine Integration

PMW 170
Communications

PMW 790
Shore & Expeditionary Integration

☐ Echelon II   ☐ Echelon III

Current and Potential Commercial SATCOM

General SATCOM Procurement Characteristics

- Commercial Terminals/Antenna Control Units/Modems
  - Designed to Navy specifications or
  - Modified COTS or
  - COTS
- Leased Space Segments
- Leased Commercial Gateways or
  - DoD Teleport Sites
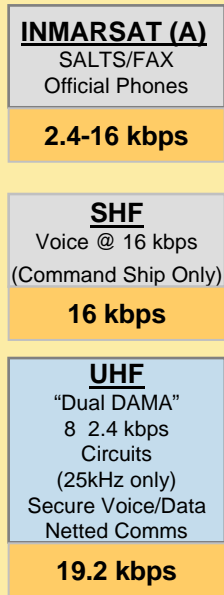- Leased Terrestrial Connectivity

Current and Potential Programs

- Commercial Wideband Satellite Program (CWSP)
  - PMW/A 170
- Commercial Broadband Satellite Program (CBSP)
  - PMW/A 170
- Television- Direct to Sailors (TV-DTS)
  - PMW/A 170
- Inmarsat
  - PMW/A 170
- Airborne Inmarsat
  - PMW 750/PMW/A 170/NAVAIR
- Naval Expeditionary Combatant Command (NECC)
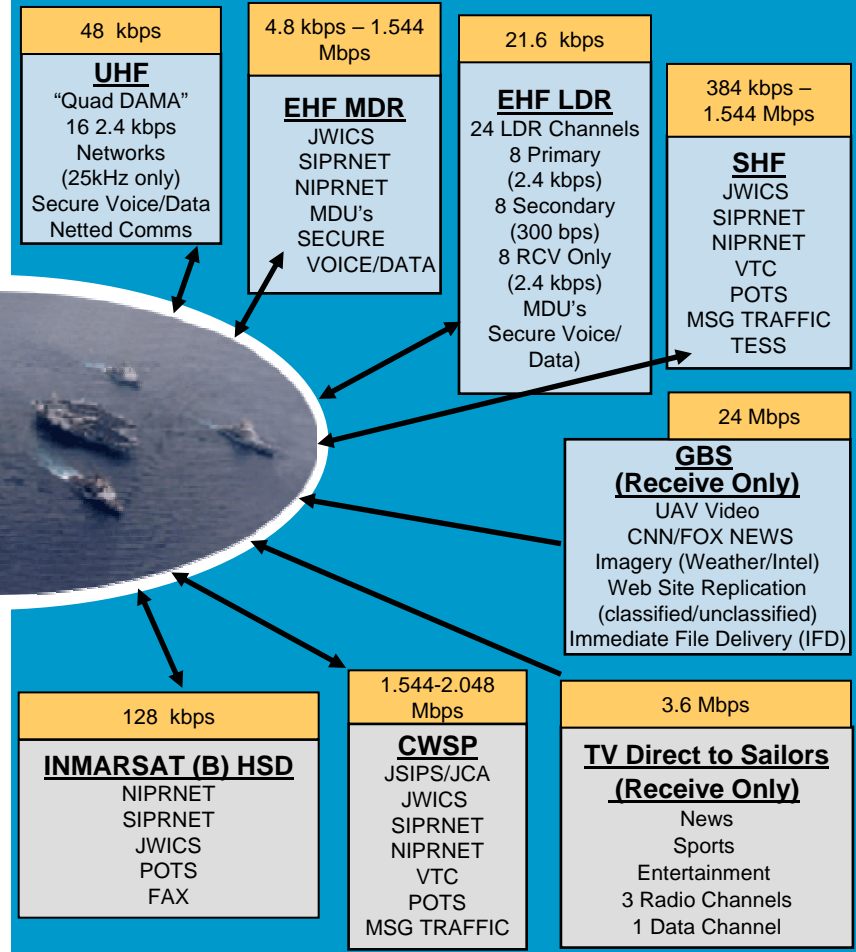 - PMW 790
- Submarine Communications
  - PMW 770

COTS: Commercial Off the Shelf
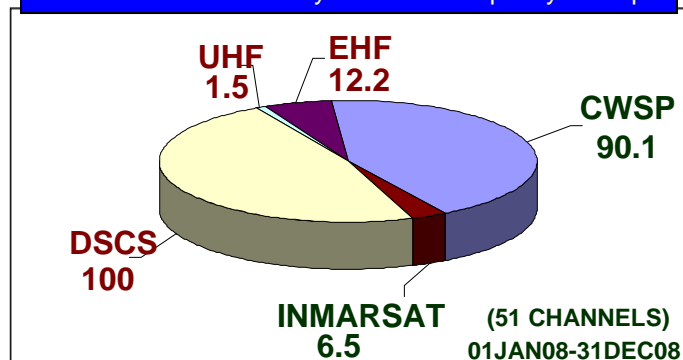
Navy SATCOM Capability Growth

Desert Storm c.1990

INMARSAT (A)
SALTS/FAX
Official Phones

2.4-16 kbps

SHF
Voice @ 16 kbps
(Command Ship Only)

16 kbps

UHF
"Dual DAMA"
8 2.4 kbps
Circuits
(25kHz only)
Secure Voice/Data
Netted Comms

19.2 kbps

Current Worldwide Navy SATCOM Capacity in Mbps

UHF
1.5

EHF
12.2

CWSP
90.1

DSCS
100

INMARSAT
6.5

(51 CHANNELS)
01JAN08-31DEC08

Today

48 kbps

UHF
"Quad DAMA"
16 2.4 kbps
Networks
(25kHz only)
Secure Voice/Data
Netted Comms

4.8 kbps – 1.544 Mbps

EHF MDR
JWICS
SIPRNET
NIPRNET
MDU's
SECURE
VOICE/DATA

21.6 kbps

EHF LDR
24 LDR Channels
8 Primary
(2.4 kbps)
8 Secondary
(300 bps)
8 RCV Only
(2.4 kbps)
MDU's
Secure Voice/
Data)

384 kbps – 1.544 Mbps

SHF
JWICS
SIPRNET
NIPRNET
VTC
POTS
MSG TRAFFIC
TESS

24 Mbps

**GBS
(Receive Only)**
UAV Video
CNN/FOX NEWS
Imagery (Weather/Intel)
Web Site Replication
(classified/unclassified)
Immediate File Delivery (IFD)

128 kbps

INMARSAT (B) HSD
NIPRNET
SIPRNET
JWICS
POTS
FAX

1.544-2.048 Mbps

CWSP
JSIPS/JCA
JWICS
SIPRNET
NIPRNET
VTC
POTS
MSG TRAFFIC

3.6 Mbps

**TV Direct to Sailors
(Receive Only)**
News
Sports
Entertainment
3 Radio Channels
1 Data Channel

Current Satellite Connectivity

UFO/EHF
(Q Band)

MILSTAR
(Q Band)

UFO/GBS
(Ka Band)

DSCS /
DSCS SLEP
(X Band)

C Band

Ku Band

INMARSAT
(L Band)

Ship/Sub

MILSATCOM

COMMERCIAL

Protected (EHF)	Narrowband	GBS	DSCS		CWSP	CBSP	TV-DTS	INMARSAT
USC-38(V)	WSC-3(V)	USR-10(V)	WSC-6(V)5		WSC-8(V)1	USC-69(V)1	OE-556/U	INMARSAT B HSD
			WSC-6(V)7		WSC-8(V)2		OE-556A/U	
			WSC-6(V)9					

Navy SATCOM Roadmap

Way Ahead: Navy's intent for the future is to continue reliance on MILSATCOM. We plan to maintain the ability to use Commercial SATCOM as an augmentation to MILSATCOM.

Updated: 15 Mar 07

Acceptable System/Program Status
Marginal System/Program Status
Unacceptable System/Program Status
System/Program Sustainment
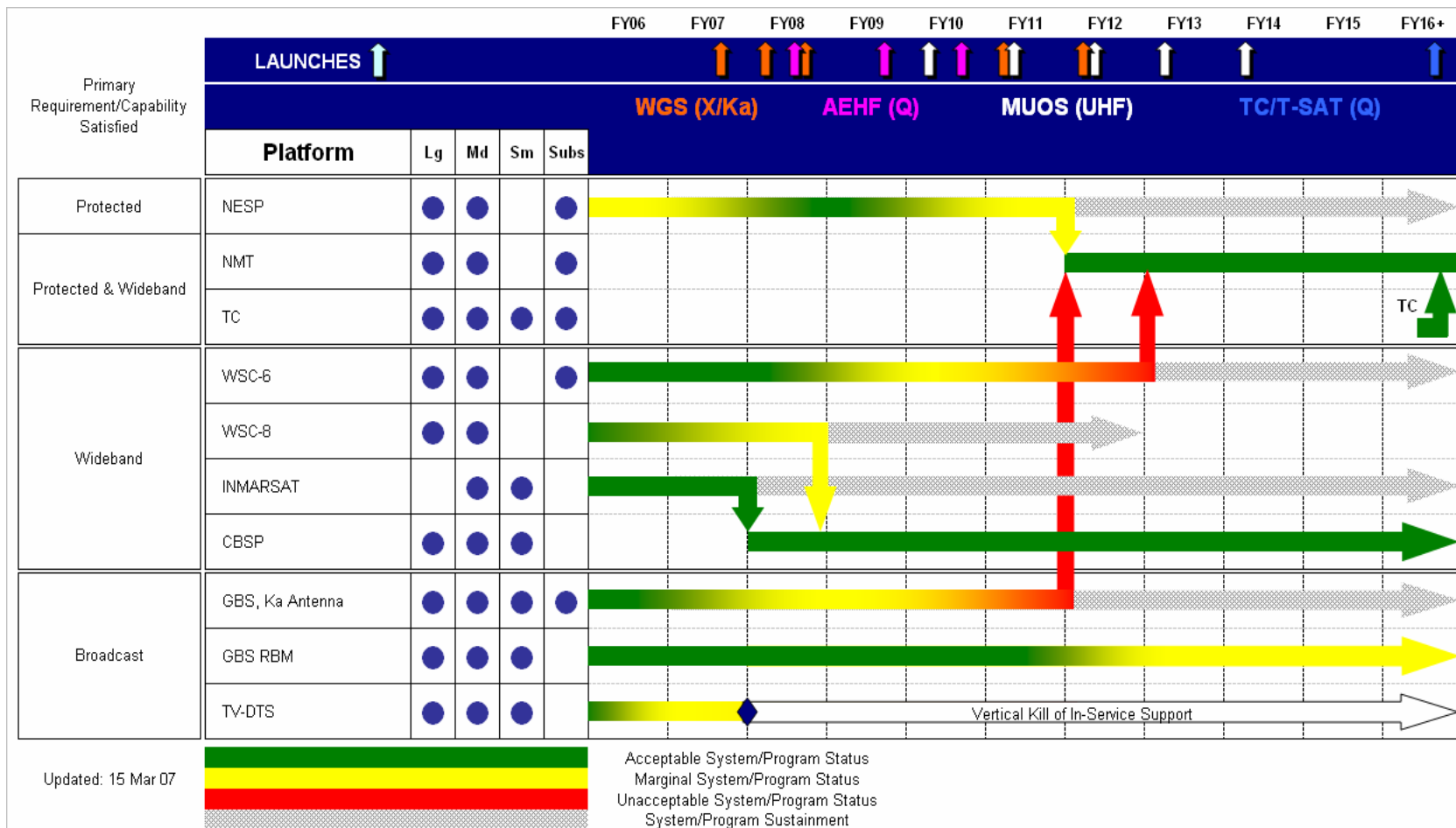
Considerations

Requirements

- Architecture/Capability:
  - Latency
  - Peak and normal throughput
  - Geographic coverage
  - Security
- Cost:
  - Return on Investment
  - Contract strategies
- Schedule:
  - Acquisition rigor
  - Fielding cycle
- Performance:
  - Network limitations
  - Spectrum
  - Static vs. dynamic

Challenges

- Environmental & other:
  - Shock
  - Vibration
  - Wind Loading
  - Green Water Loading
  - Topside blockage
  - Antenna Hand-over
  - Radar Cross-section
  - Antenna size/weight limitations
  - Ship Weight & Moment impact
  - Missile/Gun Blast
  - RADHAZ
  - Stack Gas Effects
  - Electromagnetic Compatibility
  - Training
  - Acquisition documentation
  - Satellite Coverage Areas

End to end capabilities and limitations:

| Network | Encryption | Modem | Antenna | Space Segment |

Navy COMMERSAT Acquisitions – Lessons Learned

- The Navy has established a centralized requirements based commercial SATCOM program in CWSP and Inmarsat
  - Centralized organization for acquisition and operations
  - Established streamlined leasing and provisioning process
  - Single Program Manager for Commercial SATCOM program(s)
- End to End Performance-based competitive acquisitions
  - Contract for Consolidated Requirements Whenever Possible
- Don't try to duplicate organically what industry does
  - Navy uses Navy unique, COTS or modified COTS terminals for shipboard operations
- Looking to Industry for help
  - RFIs and draft RFPs

Navy COMMERSAT Acquisitions – Looking forward

- Forecasting future needs for Commercial SATCOM with sufficient accuracy

- Satellite architecture solutions must provide for worldwide coverage
  - Blue water Navy requires open ocean and worldwide coverage

- Future Acquisition Approaches under consideration:
  - Dynamic modulation schemes (DAMA, DVB-RCS)
    - Stovepipe end-to-end architecture works
      Transmission Security limitations currently drive this architecture
  - Lease Portability
  - Surge Pre-emptability
  - Greater Flexibility in Use
  - Multiple Terminal Types
  - Government to Government Terminations with Contractor Monitoring and Control

- Continuing to look for innovative leasing solutions, multi-band solutions, and reliable systems.

DVB-RCS - Digital video broadcast return channel satellite
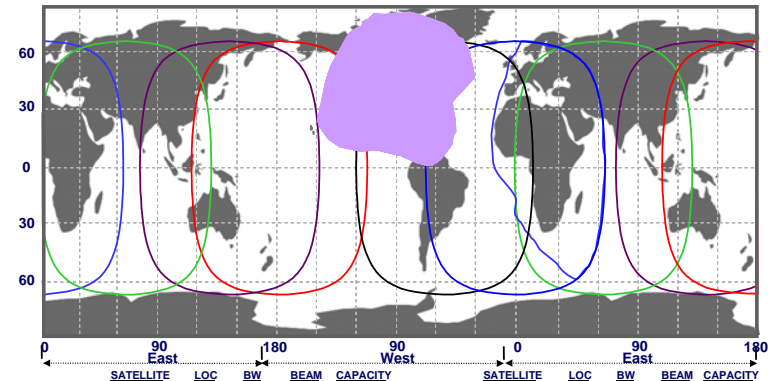
Closing

- PEO C4I continues to look forward to working with Industry

- Navy SATCOM User's Workshop is a step towards better understanding of Navy requirements/challenges and Industry capabilities

Navy Commercial SATCOM Points of Contact

PMW 170 Program Manager: CAPT John Pope

PMW 170 Deputy Program Manager: Vince Squitieri

SATCOM Division Director: Kai Tang

Please direct all inquiries to the Navy Communication Program Office: 619-524-7930

PEOC4I.NAVY.MIL

Questions?