



Information As Warfare On The Leading Edge

28 JAN 2013

Presented by
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Commanding Officer
SPAWAR Systems Center Pacific



Imminent Domain (Operational Advantage)

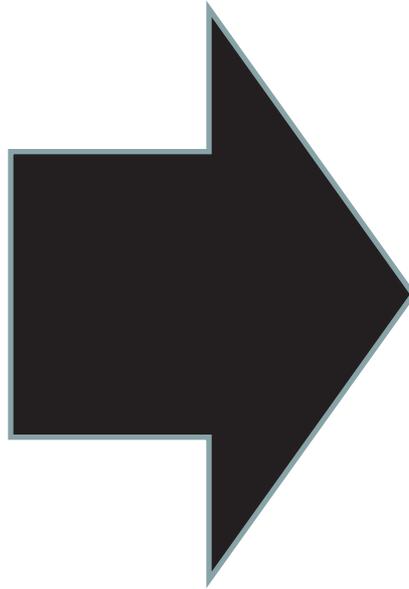
*“Future conflicts will be won in a new arena – that of the electromagnetic spectrum and cyberspace. **We must merge, then master those realms.**”*

“Imminent Domain” by ADM Jonathan W. Greenert, CNO,
PROCEEDINGS MAGAZINE, NOV 2012



Dominating The Electromagnetic Spectrum

- Enabler
- Weapon
- Threat
- Domain
- Discipline



Warfighting

- Assured C2
- Battlespace Awareness
- Integrated Fires

“The supreme art of war is to subdue the enemy without fighting.” The Art Of War by Sun Tzu



Dominating The Electromagnetic Spectrum

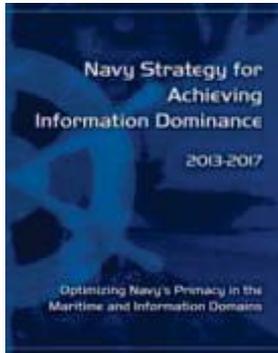
- We live in a **wireless world**
- Networks critical to managing EM spectrum... **requires new approach**
- Like ASW... **must live in domain... *understand and manage***
- Must **command EM environment !**

Sense...
Understand...
Command...
Dominate!



N2/N6 Information Dominance Strategies

Enabling Navy to fight and win today..., and tomorrow



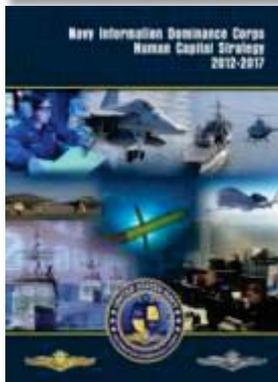
▼ **Navy Strategy For Achieving Information Dominance** frames the approach that will guide the development of our information capabilities and their integration into the Navy as a core warfighting competency

Focus Areas:

- Assured Command and Control
- Battlespace Awareness
- Integrated Fires



▼ **Cyber Power 2020** introduces methods to build a relevant and extremely capable Navy Cyber warfighting force for the future



▼ **Information Dominance Human Capital Strategy** charts a comprehensive course that ensures our workforce receives the training, qualification, experience, and tools it needs to succeed



“Pivot To The Pacific” – Why?



CB002140 [RF] © www.visualphotos.com

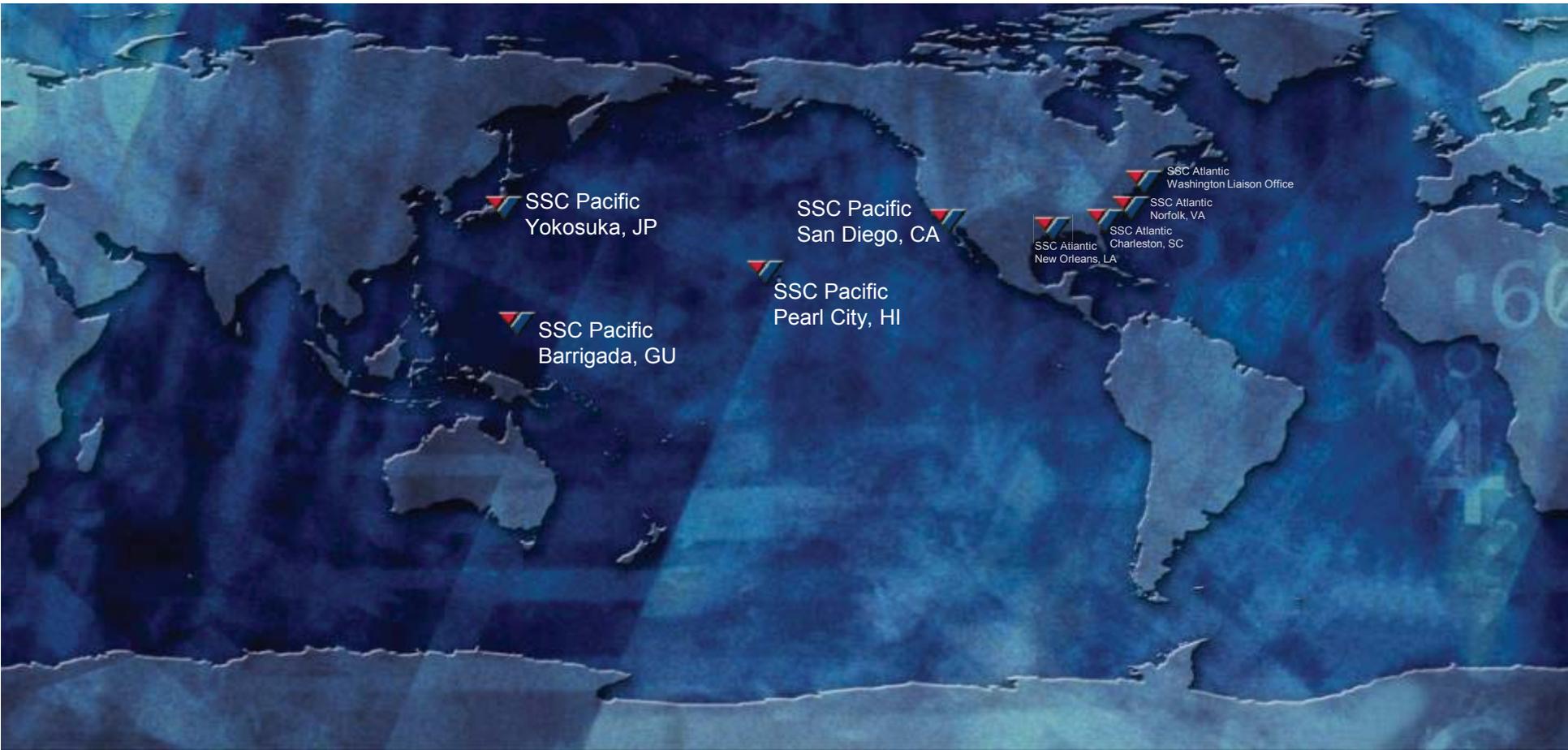
- Deepen U.S. credibility
- Expand U.S. presence
- Strengthen U.S. relations

***Supports National
Defense strategic
direction and priorities!***

“... strategy must drive the defense budget,
not the other way around...” President Obama

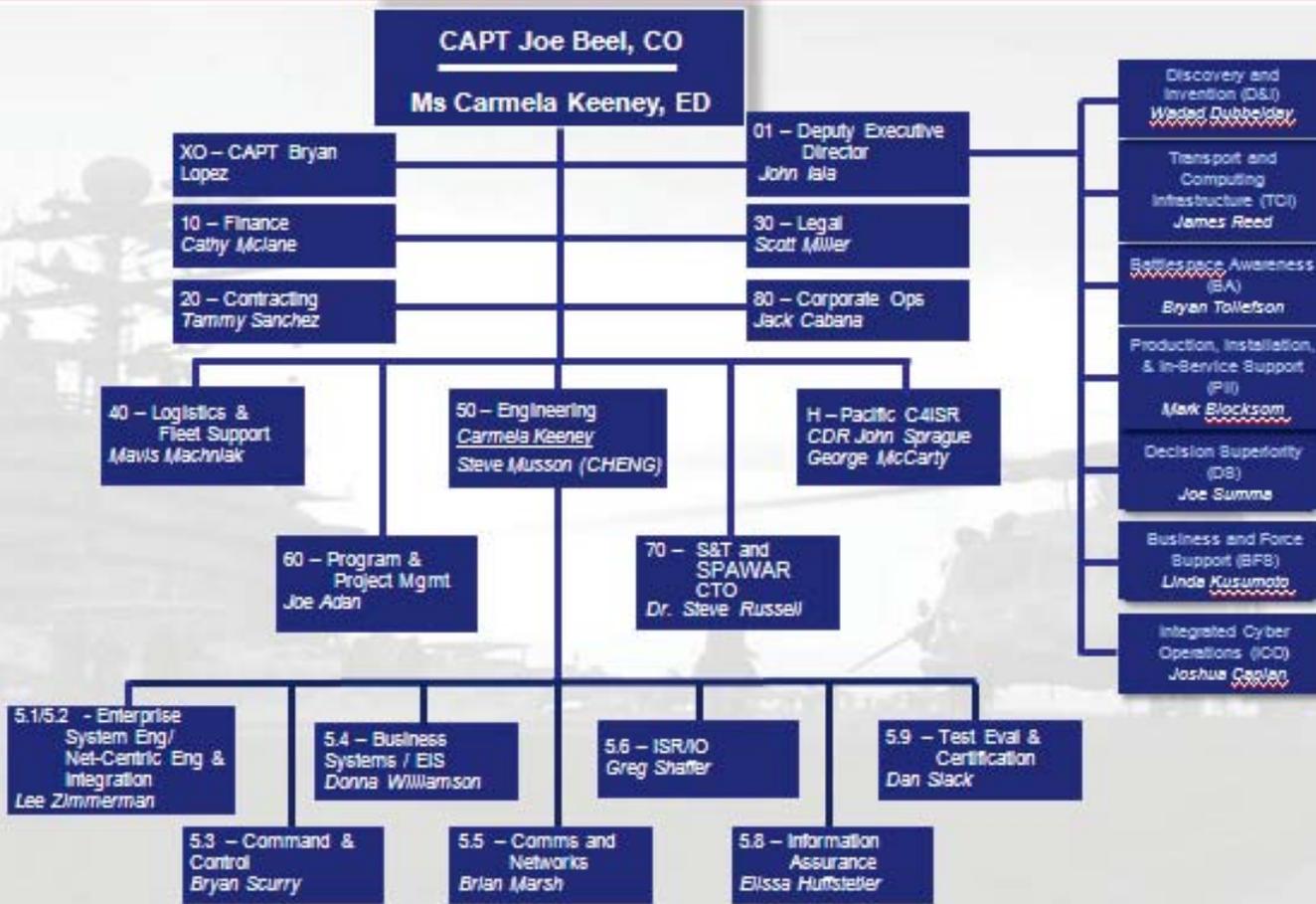


“Pivot to The Pacific”





Pacific Pivot – SSC Pacific, San Diego



Hawaii Accomplishments

- C4I Military Construction
- Joint Capabilities Technology Demonstration support Computer Adaptive Defense In-Depth
- Defense Readiness Reporting System Navy (DRRS-N)
- Pierside networks
- Intrusion detection systems
- Program Managers Dashboard
 - Project Fusion
 - SEAShare Migration



Guam Accomplishments

- C4I MILCON
 - CSS 15
 - SOCPAC Singapore
 - Naval Hospital Guam
 - Military buildup
- RIMPAC 2012
- Bldg 4160 relocation





Pacific Pivot – SSC Pacific, Japan

Japan Accomplishments

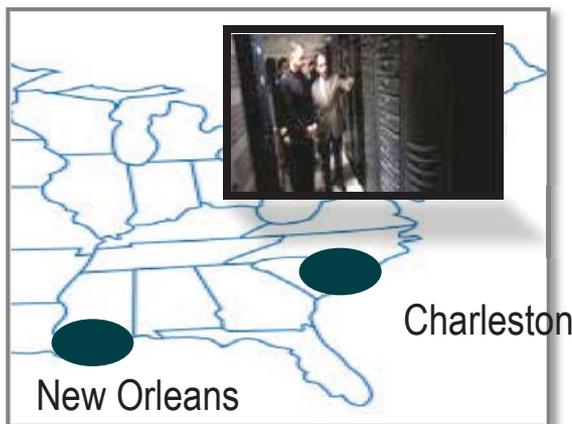
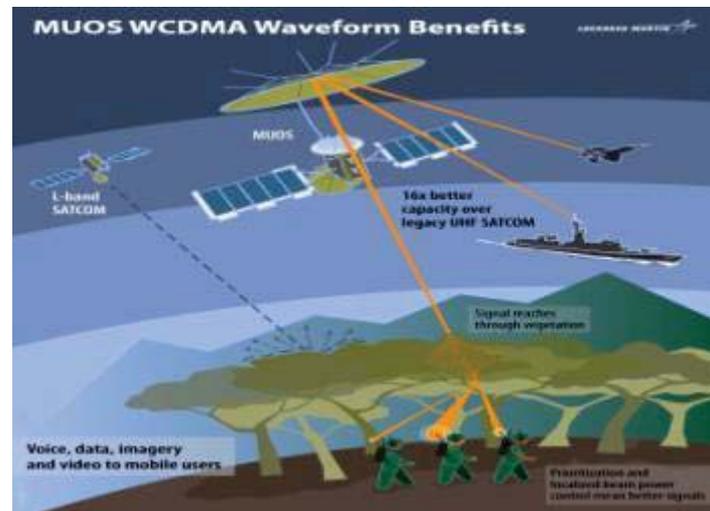
- Maintenance/modernization
 - USS BLUE RIDGE
 - USS GEORGE WASHINGTON ESG
 - USS BONHOMME RICHARD ESG
- Support to C7F, CTF70, CTF76
- Yokose LCAC project
- NCTS Far East renovation





FY12 Major Initiatives

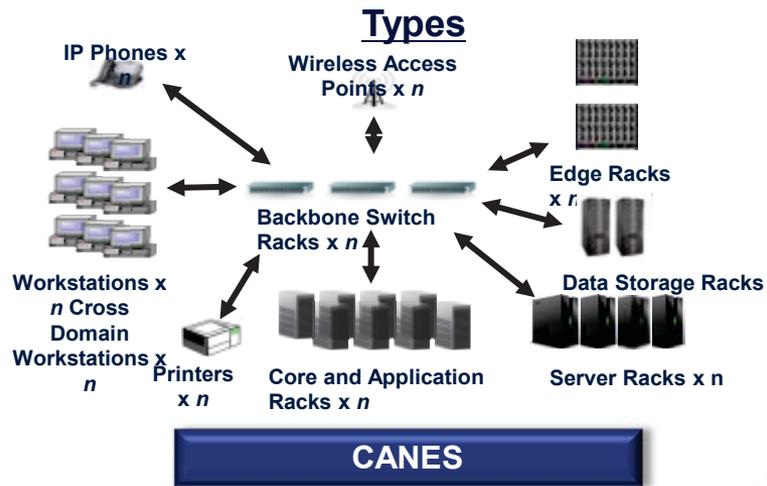
- Consolidated Afloat Networks and Enterprise Services (CANES)
- Mobile User Objective System (MUOS)
- Single IT Tech Authority
- Activities in the Middle East
- Data Center Consolidation (DCC)
- UxV (Data To The Cloud)
- Enterprise Software Licensing (ESL)





FY12 Engineering Highlights

CANES Hardware Overview - All Platform



Achieved
CMMI-DEV
Maturity Level 3
(v1.3)

First successful
Navy lab CMMI
v1.3 appraisal



Explosive Ordnance Disposal Unmanned Underwater Vehicles



Tactical Data Link Interoperability Certification Test



FY12 Fleet Support Highlights



- ▼ Completed 271 C4ISR installations (166 afloat, 105 ashore)
- ▼ Trained 1200+ Sailors and Civilians on Fleet C4I; delivered 115 Mobile Training Team events.
- ▼ REMEDY Tickets Created By SSC Pacific C4I Help Desk Listed By System for Fiscal Year 2012 – 14,223



Count for FY12 IMO installations:

Platform	Completed	In progress
Ship	118	374
Sub	48	115
Shore	105	195
Total	271	684

FY12 S&T Highlights

Microbial Fuel Cells: Free Power from the Mud!

Low-Power Devices

Bottom dwelling oceanographic sensors

Novel Applications

Understanding Performance

Improving Performance

Operational Testing

Scale Up & Deployability

Applicability in the Deep Sea

Relation to Environmental Conditions

Sediment Power Potential

Free vehicle equipment lamp

Water Sediment

Cathode reaction: $2O_2 + 4H^+ + 4e^- \rightarrow 4H_2O$

Anode reaction: $C_2H_6O + 2H_2O \rightarrow 2CO_2 + 4H^+ + 4e^-$

Acetate

Fermentation

Organic matter

Carbon-graphite anode

Bioscoupling Agent

Biomolecule



Mission Ready

USS Berford

Unit

Conduct MIO

Tasks

NETOPS

Sensors

Overall Ready

MTC2 provides dynamic C2, anchored by Enhanced SA through a rapid-access Information "Halo"

Maritime Tactical C2 (MTC2) with C2 Rapid Prototyping Continuum (C2RPC) Capability

AEODRS Prototype

Add-on Autonomy Module for Ground Robots

OTM C3 - HMMWV to MRAP

Networking on the Move (NOTM)

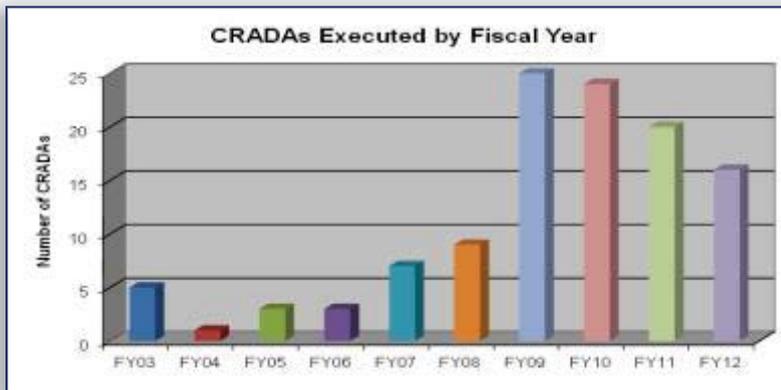
Application of Cryogenic Cooling to Signals Exploitation



Intellectual Capital and Partnerships

CRADA - Cooperative Research and Development Agreement

- ▼ CRADAs help establish and foster R&D partnerships with industry and academia
- ▼ CRADAs help advance technology and move innovation from the lab to the market and ultimately the warfighter



▼ San Diego based Collaborators:

- Assure Controls
- Intellis
- Sullivan Energy and Technology
- Trex Enterprises Corporation
- AT&T Government Solutions
- Lumedyne Technologies
- Cubic Defense Applications
- City of San Diego
- Vision Robotics Federal Systems
- SeaSpace Corporation

Technology Transfer



- ▼ Why T2 is important at SSC Pacific
 - Promotes innovation and creativity with SSC Pacific technology
 - Important pathway to move Navy innovation from lab to market and ultimately the warfighter



- ▼ Two San Diego based start-up companies formed as a result of licensing SSC Pacific technologies

Patents & Publications

PATENTS	FY12	PUBLICATIONS	FY12
Disclosures	96	Journal Article	109
Patents Filed	58	Conf. Papers	318
Patents Issued	71	TRs/TDs	29



Challenges and Opportunities



Connectivity - IP In The Cockpit



Iridium SPIRNET chat

Aircrews aboard E2-C “Hawkeye” aircraft from VAW-113 USS RONALD REAGAN (CVN 76) using new network to expand and expedite information flow to first responders on the ground in Japan

Speed To Capability - RAD SHARC

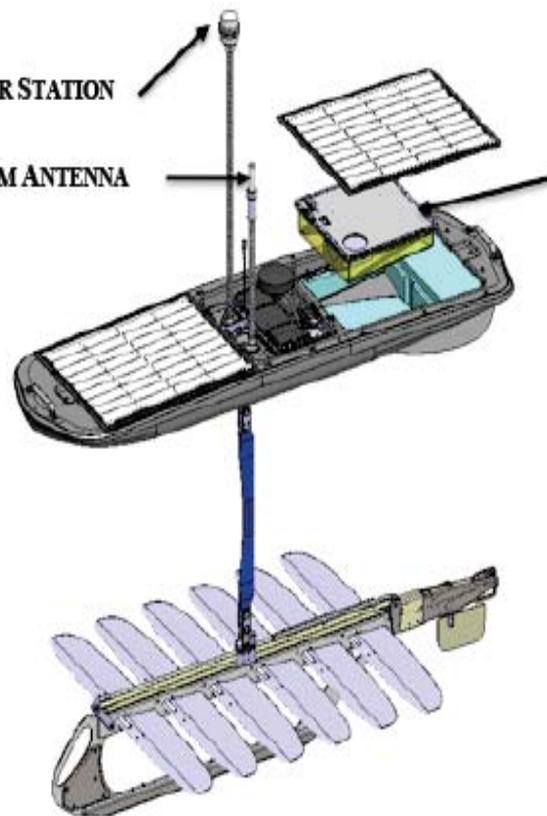
AN/PDR-78 Underwater Gamma Detector



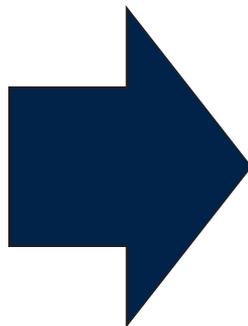
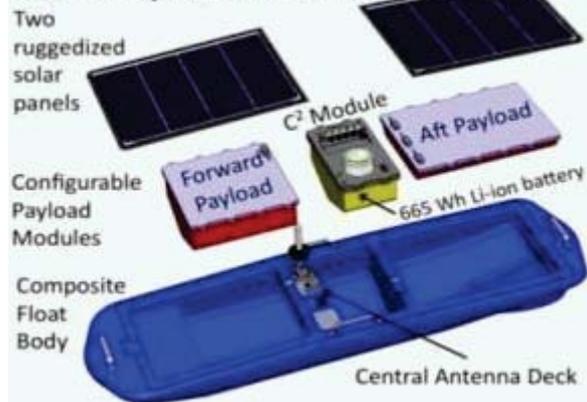
AIRMAR PB200 WEATHER STATION

PAYLOAD IRIDIUM ANTENNA

RAD SHARC PAYLOAD



Modular Payload Architecture





Unmanned systems - Mk18 Kingfish



Navy dolphins losing out to robots But marine mammals still beat machines at security, retrieval

By Jen Steele, San Diego Union Tribune, 01 DEC 2012



"We've demonstrated the ability to employ more modern unmanned systems, including autonomous underwater vehicles deployed from the ships to hunt for and detect mines and some advanced capabilities."

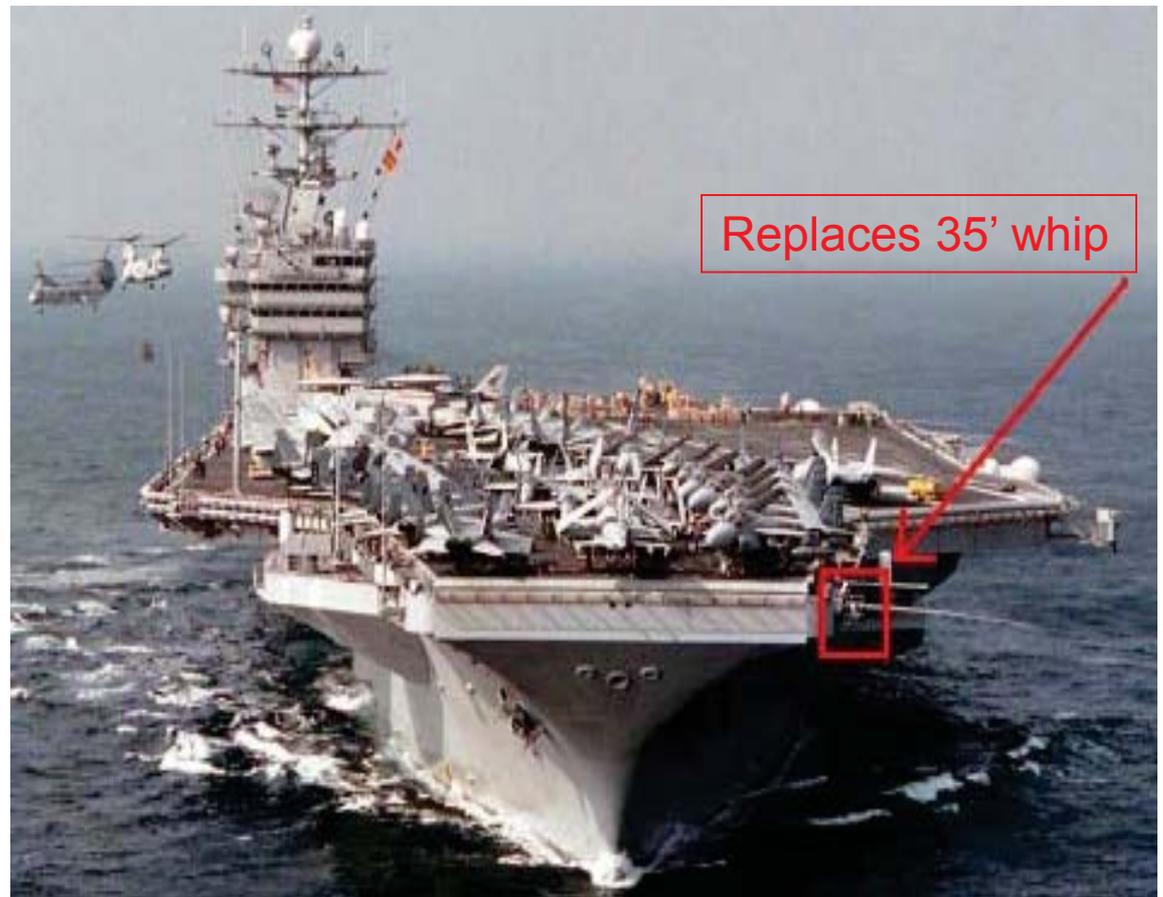
Vice Admiral John W. Miller, Commander, U S Naval Forces Central Command, United States Fifth Fleet, Combined Maritime Forces following 30-nation International Mine Countermeasures Exercise, SEP 2012



Reduce Complexity

Mast Clamp Current Probe (MCCCP)

- ▼ Replacing whip antennas aboard DDGs and CVNs
- ▼ Millions saved through...
 - Reduced procurement costs
 - Avoided maintenance costs





Moving Forward

- ▼ Reduce complexity
- ▼ Increase rigor and use of common systems
- ▼ Increase Speed to Capability
 - Tech Transitions (T2)
 - Delivery of capabilities
- ▼ Innovate, Integrate, Interoperate
- ▼ Increase system engineering, process improvement
- ▼ Reduce cost of doing business

Deliver Information Dominance!



Must reads!

http://www.defenseinnovationmarketplace.mil/resources/Navy_Strategy_for_Achieving_Information_Dominance.pdf

<http://www.usni.org/magazines/proceedings/2012-10/navys-newest-warfighting-imperative>

http://www.public.navy.mil/fcc-c10f/Strategies/Navy_Cyber_Power_2020.pdf

<http://www.usni.org/magazines/proceedings/2012-12/imminent-domain>