CHANGING ROLES AND REDUCING RISK IN TESTING THE BATTLESPACE OF THE FUTURE
NDIA T&E SUMMIT, CANADA

RADM BERT JOHNSTON
VICE COMMANDER, NAVAL AIR SYSTEMS COMMAND
26 FEB 2003
NAVAIR SITES

NAVAIR DEPOT, NORTHERN, CA
Provides comprehensive quality aviation support to the nation’s warfighters.
Aircraft: F/A-18 Hornet; E-2C Hawkeye; C-2 Greyhound; S-3 Viking; H-60 Seahawk

NAVAIR DEPOT, CHERRY POINT, NC
Delivers on time quality products and services for Naval Aviation as service to the fleet.
Aircraft: AV-8B, Harrier; H-53, Sea Stallion; C-130, Hercules; H-46, Sea Knight; V-22, Osprey; VH-3, Presidential Helicopter

NAVAIR DEPOT, NORTH ISLAND, CA
Provides comprehensive quality aviation support to the nation’s warfighters.

WEAPONS DIVISION, CHINA LAKE & PT MUGU, CA
Provides our forces with effective and affordable integrated warfare systems and life cycle support to ensure battlespace dominance.

AIRCRAFT DIVISION, LAKEHURST, NJ
Provides aircraft launch and recovery expertise to the fleet.

TRAINING SYSTEMS DIVISION, ORLANDO, FL
Center for research, development, test and evaluation, acquisition and product support of training systems for the world.

AIRCRAFT DIVISION, PATUXENT RIVER, MD
Provides acquisition management, research and development capabilities, air and ground test and evaluation, aircraft logistics and maintenance management for Naval Aviation.

NAVAIR DEPOT, JACKSONVILLE, FL
Delivers high quality maintenance, engineering, logistics and support services to the fleet.
Aircraft: P-3 Orion; EA-6B Prowler; F-14 Tomcat, F/A-18 Hornet; S-3 Viking; SH-60 Seahawk

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NAVAIR’S ROLE IN NAVAL AVIATION IS . . .

. . . TO DEVELOP, ACQUIRE AND SUPPORT AIRCRAFT AND RELATED SYSTEMS WHICH CAN BE OPERATED AND SUSTAINED AT SEA

. . . TO WORK WITH INDUSTRY ON BEHALF OF THE USER TO DELIVER OUR PRODUCTS AND SERVICES

OUR CORE FOCUSES ON WHERE WE ARE DIFFERENT
SIZE OF WORKFORCE

WORKLOAD TRENDS... FY89 THRU FY03

- ACAT PROGRAMS
  -17%
  185 TO 154

- ACTIVE AIRCRAFT
  -24%
  5.5K TO 4.2K

- ACTIVE TMS
  -29%
  153 TO 109

ACAT I-IV: +11% INCREASE
FY97 (139) TO FY03 (154)

MILITARY / CIVILIAN *

CONTRACTOR **

NAV AIR WORKFORCE

FISCAL YEAR

0 10,000 20,000 30,000 40,000 50,000 60,000

90 91 92 93 94 95 96 97 98 99 00 01 02 03

MILITARY - 3,336
CIV - 23,641

53% MIL/CIV REDUCTION FY90-03

52% MIL/CIV/CONTRACTOR

SLIDE UPDATE: 2 DEC 02

NOTE: FY90-FY94 - INCLUDES ESTIMATES FOR FACILITIES
IN BASE OPERATING SUPPORT FY91 FSC "A" CODE DATA IS
NORMALIZED DUE TO DATA UNAVAILABILITY

* CIVILIAN: FY90-01 ARE CERTIFIED E/S NORMALIZED TO POST BRAC 95 ALIGNMENT; FY02-03 IS FY03 PRESIDENT'S BUDGET
MILITARY: FY90-01 ARE CERTIFIED E/S NORMALIZED TO POST BRAC 95 ALIGNMENT; FY02-03 IS SEP02 FYDP
** FSC CODES: "R" (PROF, ADMIN, MGMT), 5.0 T&E AND RANGE, NAVFAC BASE OPER SPT, "B" (SPEC STUDIES), "D" (ADP),
"L" (TECH REP SVCS), "U" (EDUC, TRNG), AND "V" (TRANSP, TRAVEL, RELOC), "A" (RDT&E STUDIES)

10,970 IS DRAFT ESTIMATE FY03 TOTAL CONTRACTOR

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RANGE WORKLOAD FACTS

<table>
<thead>
<tr>
<th>WEST LAND RANGE</th>
<th>PACIFIC SEA RANGE</th>
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<tbody>
<tr>
<td>• REVENUE:</td>
<td>• REVENUE:</td>
</tr>
<tr>
<td>+40%</td>
<td>+49%</td>
</tr>
<tr>
<td>• TEST EVENTS:</td>
<td>• TEST EVENTS:</td>
</tr>
<tr>
<td>+19%</td>
<td>+17%</td>
</tr>
<tr>
<td>• TEST HOURS:</td>
<td>• TEST HOURS:</td>
</tr>
<tr>
<td>+28%</td>
<td>+30%</td>
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</table>

** WORKLOAD INCREASE OF 25-30% OVER FY01

<table>
<thead>
<tr>
<th>ATLANTIC TEST RANGE</th>
<th>T&amp;E AIRCRAFT</th>
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<tbody>
<tr>
<td>• REVENUE:</td>
<td>REVENUE:</td>
</tr>
<tr>
<td>+30%</td>
<td>+8%</td>
</tr>
<tr>
<td>• TEST EVENTS:</td>
<td>TEST EVENTS:</td>
</tr>
<tr>
<td>-2%</td>
<td>+14%</td>
</tr>
<tr>
<td>• TEST HOURS:</td>
<td>TEST HOURS:</td>
</tr>
<tr>
<td>+27%</td>
<td>+14%</td>
</tr>
</tbody>
</table>

TEST EVENTS DECREASED WHILE AVERAGE LENGTH INCREASED AN HOUR PER EVENT
PRELIMINARY CONCLUSIONS

• NAVAIR HAS REDUCED WORKFORCE & FACILITIES, YET...

• NAVAIR RANGE USE HAS INCREASED AND BECOME INCREASINGLY COMPLEX
  – CENTERS OF EXCELLENCE OFFER SOPHISTICATED FACILITIES
  – WIDE USER BASE, INCLUDING
    • FLEET
    • NAVY’S SISTER SERVICES
    • INDUSTRY
EVOLUTION FROM “RDT&E” TO “RDT\textsuperscript{2}E\textsuperscript{2}”

EVOLUTION IS DRIVEN BY CHANGING TECHNOLOGY AND NEW OPERATIONAL REQUIREMENTS.

THE OLD PARADIGM. . .RDT&E

RESEARCH & DEVELOPMENT, TEST & EVALUATION

THE NEW PARADIGM. . .RDT\textsuperscript{2}E\textsuperscript{2}

RESEARCH & DEVELOPMENT, TEST & TRAINING, EVALUATION & EXPERIMENTATION

UNDER THIS NEW APPROACH, NAVAIR RANGES:

• ARE WORKING WITH FLEET EXERCISE PLANNERS TO DEVELOP TRAINING RANGE STRATEGY (TRS) – THE ROADMAP FOR ALL FUTURE PLANNING

• PROVIDE SUPPORT TO MAJOR FLEET BATTLE EXPERIMENTS & OTHER FLEET EXERCISES
THE BATTLESPACE HAS BECOME MORE COMPLEX

NAVAIR’S T&E ROLE HAS CHANGED

• FROM 1920’S-1950’S, BuAER HAD MORE EXTENSIVE T&E ROLE AND ALSO BUILT OWN TEST AIRCRAFT (AT NAVAL AIRCRAFT FACTORY)

• NAVAIR HAS SINCE MOVED AWAY FROM CONSTRUCTION AND TOWARD SETTING SPECS FOR CONTRACTORS

• NAVAIR’S NEW ROLE: TO DETERMINE THE PARAMETERS OF THE “BATTLESPACE”
  – SET REQUIREMENTS FOR A “SYSTEM OF SYSTEMS”
    • A SYSTEM TO LINK ALL PLATFORMS AND COMMANDERS AND WEAPONS, BY MEANS OF REAL-TIME COMMUNICATIONS
MILITARY TECH INCREASES SINCE 1950

“LET ME GIVE YOU SOME EXAMPLES OF HOW MILITARY TECHNOLOGY HAS PROGRESSED BETWEEN 1950 AND TODAY, AS A RESULT OF NUMEROUS TECHNOLOGICAL BREAKTHROUGHS.

“AIRCRAFT RANGE HAD QUADRUPLED FROM 2,000 TO 8,000 MILES.
“AIRCRAFT SPEED HAS INCREASED FROM 500 MILES TO 2,000 MILES.
“MAXIMUM AIRCRAFT PAYLOAD HAS QUINTUPLED FROM 10 TONS TO 50 TONS.
“NAVIGATION PRECISION HAS FALLEN FROM A TENTH OF A MILE TO A THOUSANDTH OF A MILE.
“AND RADAR RESOLUTION AND RANGE HAVE IMPROVED BY TEN THOUSAND-FOLD AND FIVE HUNDRED-FOLD, RESPECTIVELY.”

NAVAL AIR IN AFGHANISTAN

“IN DESERT STORM, WE SCHEDULED INTO THE TENS OF AIRCRAFT PER TARGET. IN OPERATION ENDURING FREEDOM, NAVY TACTICAL AIR ON AVERAGE STRUCK MORE THAN TWO TARGETS PER AIRCRAFT THAT DELIVERED ORDNANCE.”

HISTORICAL “SPECTRUM OF CONFLICT”:
THE TALE OF TWO BRIDGES

APPROACH TO THANH HOA BRIDGE -
“VALLEY OF THE MOON”

<table>
<thead>
<tr>
<th>WEAPON</th>
<th>SORTIES</th>
<th>LOSSES</th>
<th>RESULTS</th>
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<tbody>
<tr>
<td>UNGUIDED BOMBS</td>
<td>800</td>
<td>10</td>
<td>BRIDGE STANDING</td>
</tr>
<tr>
<td>LASER GUIDED BOMBS</td>
<td>4</td>
<td>0</td>
<td>BRIDGE DESTROYED</td>
</tr>
<tr>
<td>INS/GPS GUIDED BOMBS</td>
<td>1/2</td>
<td>0</td>
<td>BRIDGE DESTROYED IN ADV WX</td>
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WHERE WE ARE GOING . . .

NETWORK CENTRIC WARFARE

“. . . AN INFORMATION SUPERIORITY-ENABLED CONCEPT OF OPERATIONS THAT GENERATES INCREASED COMBAT POWER BY NETWORKING SENSORS, DECISION MAKERS, AND SHOOTERS”

1) “NETWORK CENTRIC WARFARE - DEVELOPING AND LEVERAGING INFORMATION SUPERIORITY”, 2ND EDITION (REVISED), DOD C4ISR COOPERATIVE RESEARCH PROGRAM, 1999
# NAVAIR’S CHANGES IN FOCUS

## WE WILL FOCUS LESS ON . . .

- NEW PLATFORM DEVELOPMENT
- ORGANIC SHORE-STATION SUPPORT
- ORGANIC T&E RANGE SUPPORT
- MATERIAL AND DATA MGT.
- TRANSACTION PROCESSING

## AND MORE ON . . .

- EXPLOITATION OF PLATFORMS’ CAPABILITIES (NETWORK NODES)
- INTEGRATION OF SYSTEMS
- INTEROPERABILITY (JOINT, ALLIED)
- SIMULATION / INTEGRATED FLIGHT & SIMULATED ASSET TESTING (& TRAINING)
- SENSORS / FUSION
- PRECISION / TIME-SENSITIVE STRIKE
- UNMANNED VEHICLES
- TOTAL OWNERSHIP COST (TOC)
- AGING AIRCRAFT
- PRIVATE SECTOR “PARTNERSHIPS” AND COMMERCIAL PRACTICE
- WARFIGHTER INTERACTIONS
- WEB-BASED / ENABLED SYSTEMS
MIGRATION OF CONTRACTOR-GOV’T RELATIONSHIP

<table>
<thead>
<tr>
<th>FORMER MODEL</th>
<th>NEW MODEL</th>
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<tbody>
<tr>
<td>OVERSIGHT</td>
<td>INSIGHT</td>
</tr>
<tr>
<td>CUSTOMER</td>
<td>CUSTOMER / PARTNER / SUPPLIER</td>
</tr>
<tr>
<td>PLATFORM-CENTRIC</td>
<td>NETWORK-CENTRIC</td>
</tr>
<tr>
<td>SERVICE ORIENTATION</td>
<td>JOINT ORIENTATION</td>
</tr>
<tr>
<td>“CREATE RUBBLE” OF TARGET</td>
<td>EFFECTS-BASED TARGETING</td>
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<tr>
<td>TECHNICAL SPECS</td>
<td>PERFORMANCE SPECS</td>
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21ST CENTURY AVIATION SOLUTIONS

NAVAL AVIATION IS POSITIONED TO FULLY LEVERAGE INFORMATION-AGE TECHNOLOGIES TO EFFECT AND OPTIMIZE NET-CENTRIC CAPABILITIES

“PLUG & PLAY” ACCESS
- INTEROPERABILITY
- SPECTRUM MGT.
- BANDWITH MGT.
- NETWORK MGT.
- INFORMATION MGT.

DISTRIBUTED MEMORY
- LOCAL DATA STORAGE WITH DEFINED SCOPE, SCALE, AND TIMEFRAME

USER GETS:
FUNCTIONAL COLLABORATION WITH OTHER NODES

ACCESS TO INFORMATION TO CREATE OWN KNOWLEDGE DOMAIN

BENEFITS OF SHARED NET AND KNOWLEDGE MGT.

DISTRIBUTED SENSING
- ORGANIC SENSORS FOR LOCAL DETAIL AND BASIC BACK-UP

DISTRIBUTED PROCESSING
- LOCAL PROCESSING = COMPUTING + MAN-IN-THE-LOOP

NETWORK PROVIDES:
LARGER SCOPE, SCALE, TIMEFRAME ON CALL
BACKPLANE FOR SHARED SITUATIONAL AWARENESS
CONVEYANCE FOR COLLABORATIVE FUNCTIONS
CHARGE-UP OF LOCAL STORAGE

USER ADDS:
LOCAL DEFINITION TO BACKPLANE
CORRECTIVE AND LEARNED FEEDBACK
METHODS FOR SETTING STANDARDS

TWO MAIN ALTERNATIVES EXIST:

“THE INTERNET MODEL”: SELF-ORGANIZING GROUPS

• NO SINGLE GROUP DOMINATES
• GROUPS ORGANIZE THEMSELVES, ARE INDEPENDENT OR SEMI-INDEPENDENT
• GROUPS ESTABLISH STANDARDS WHICH GAIN GRADUAL AND UNIVERSAL ACCEPTANCE THROUGHOUT THE INDUSTRY
  • E.G., HTTP PROTOCOL

“THE MICROSOFT MODEL”: A DOMINANT ORGANIZATION

• A SINGLE ORGANIZATION DOMINATES
• THE GROUP IS ESTABLISHED AND CONTROLLED CENTRALLY
• THE DOMINANT ORGANIZATION IS ABLE TO ENFORCE ITS OWN STANDARDS THROUGHOUT THE INDUSTRY
  • E.G., “WINDOWS” OPERATING SYSTEM
SEA POWER 21
NAVAL AVIATION CAPABILITIES

SEA SHIELD
- THEATER AIR & MISSILE DEFENSE
- LITTORAL SEA CONTROL
- HOMELAND DEFENSE

SEA STRIKE
- TIME SENSITIVE STRIKE
- PERSISTENT ISR
- INFORMATION OPERATIONS
- SHIP-TO-OBJECTIVE MANEUVER

SEA BASING
- ENHANCED SEA-BORNE POSITIONING OF JOINT ASSETS
- ACCELERATED DEPLOYMENT & EMPLOYMENT TIME

NAVAL AVIATION CAPABILITIES

SENSORS
- ATFLIR AESA PHASE II
- SHARP
- AEA DIGITAL SYS
- MMA
- JMOD II
- MH-60R MMRS (ISAR/PD)
- RMP
- AQS-22

NETWORKS
- LINK 16
- JSIP FOLLOW-ON
- CDL-N
- JASSM
- JSOW, AARGM/QB
- PJDM, SDB
- HELLFIRE FOLLOW-ON
- JAMS
- CEC / JCTN
- TBMCS

WEAPONS
- AIM-120
- AMRAAM P31
- AIM-9X
- TOMAHAWK

PLATFORMS
- CVNX
- AEA
- F/A-18C/D/E/F
- JSF
- UCAV-N
- E-2C RMP
- E-6B
- MMA
- MH-60R & S

SEA SHIELD
SEA STRIKE
SEA BASING
FORCENET
WARFIGHTER
SENSORS
WEAPONS
NETWORKS
FORCENET
SEA
SEA STRIKE
SEA SHIELD
SEA BASING
ACQUISITION & LIFE CYCLE SUPPORT

INFORMATION & KNOWLEDGE ADVANTAGE
- Mine Countermeasures
- Time Critical Targets
- Homeland Defense

SEA POWER 21
NAVAL AVIATION CAPABILITIES

ACQUISITION & LIFE CYCLE SUPPORT

NAVMAIR

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WHAT IS FORCEnet?
DEFINITION FROM CNO’S STRATEGIC STUDIES GROUP

“NETWORK CENTRIC WARFARE IS THE THEORY.

NET-CENTRIC OPERATIONS IS THE CONCEPT.

FORCENET IS THE PROCESS OF MAKING THE THEORY AND CONCEPT A REALITY.

“FORCENET (SEA POWER 21) IS THE OPERATIONAL CONSTRUCT AND ARCHITECTURAL FRAMEWORK FOR NAVAL WARFARE IN THE INFORMATION AGE THAT INTEGRATES WARRIORS, SENSORS, NETWORKS, COMMAND AND CONTROL, PLATFORMS AND WEAPONS INTO A NETWORKED, DISTRIBUTED COMBAT FORCE, SCALABLE ACROSS THE SPECTRUM OF CONFLICT FROM SEABED TO SPACE AND SEA TO LAND.”*

*CNO’S STRATEGIC STUDIES GROUP - XXI DEFINITION FROM 22 JULY 02 CNO BRIEFING
FORWARD... FROM THE LABS

LEVERAGING EXISTING TECHNICAL INFRASTRUCTURE

- COMMON SIMULATION AND STIMULATION ENVIRONMENT
- OPEN AIR RANGE
- FA-18 AWL CHINA LAKE (3 Labs)
- LAND RANGE IBAR
- PATUXENT RIVER
- ACETF
- E-2C (4 Labs) ATR
- P-3 AIP
- NDIA S&T FACILITY
- LAKE (3 Labs)
- LAND RANGE
- OPEN AIR RANGE
- WD LOCAL NETWORKS
- MBC INTEGRATION LAB
- TRAINING SYSTEMS
- WD LOCAL NETWORKS
- POTENTIAL NETWORKS
- COMMON SIMULATION AND STIMULATION ENVIRONMENT
THE DOD 5000 MODEL AND TEST & EVALUATION

TECHNOLOGY OPPORTUNITIES & USER NEEDS

• PROCESS ENTRY AT MILESTONES A, B, OR C
• ENTRANCE CRITERIA MET BEFORE ENTERING PHASES
• EVOLUTIONARY ACQUISITION OR SINGLE STEP TO FULL CAPABILITY

A
CONCEPT EXPLORATION
TECHNOLOGY DEVELOPMENT
PRE-SYSTEMS ACQUISITION
CONCEPT & TECH DEVELOPMENT

B
SYSTEM INTEGRATION
SYSTEM DEMONSTRATION
SYSTEMS ACQUISITION
(DEMONSTRATION, ENGINEERING DEVELOPMENT, LRIP & PRODUCTION)

C
LRIP / IOT&E
FULL-RATE PROD & DEPLOYMENT
IOC
LRIP / IOT&E
FULL-RATE PROD & DEPLOYMENT

FOC
SUSTAINMENT
DISPOSAL
SUSTAINMENT
OPERATIONS & SUPPORT

TECHNOLOGY DEVELOPMENT
• DEVELOP OVERALL ACQUISITION T&E STRATEGY.
• PREPARE TEST & EVALUATION MASTER PLAN (TEMP).
• PREPARE LFT&E WAIVER (IF REQUIRED).

SYSTEM INTEGRATION
• CONDUCT EARLY OPERATIONAL ASSESSMENT (EOA).
• UPDATE TEMPRIOR TO MS B.
SYSTEM DEMONSTRATION
• CONDUCT EXTENSIVE TESTING: DEVELOPMENTAL, OPERATIONAL, AND SURVIVABILITY/LETHALITY AS APPROPRIATE.

LRIP / IOT&E
• INTENSIVE TESTING: DT, FULL-UP SYSTEM LEVEL LFT&E AND IOT&E.
• UPDATE TEMPRIOR TO MS C.
FULL RATE PROD & DEPLOYMENT
• CONDUCT FOLLOW-ON OPERATIONAL TEST AND EVALUATION (FOT&E), AS APPROPRIATE.

SUSTAINMENT
• CONDUCT DT&E / FOT&E AS REQUIRED.
NAVAIR’S T&E VALUE TO THE FLEET

WE SHOW THEM “THE ART OF THE POSSIBLE”
SEE THE WORLD THROUGH THE FLEET’S EYES, AND MEASURE OUR SUCCESS BY THEIR SUCCESS