



Capable Manpower Future Naval Warfighter Capabilities

**The S&T base for Naval Manpower, Personnel, Training, and Human
Systems Integration Technologies**

Dr. Harold Guard, ONR 34
Dr. Wallace Wulfeck, ONR 342CM



“At the top of the list of things I want to see cemented is Sea Warrior and all the pieces that go into that. This is truly a revolution, and I’m going to be working that full time for the next year.”

--ADM Vern Clark, August 2003



FNWC – Major Themes

- **New Human Systems Integration Technologies**
- **Attrition Reduction & Career Management Technologies**
- **Performance Measures and Metrics**
- **Scientifically-based Distributed Learning Principles and Guidelines**
- **New Modeling and Visualization Technologies**
- **Virtual Training and Mission Rehearsal Environments**





FNWC Customers

- Supports Naval Warfare Programs:
 - Submarine, Cruise Missile, Naval Gun Programs
 - Battlegroup ASW operations
 - NAVAIR aviation simulation master plan
- 30% of program supports USMC
 - Expeditionary Warfare (e.g., EFV, LCAC, MV-22)
 - Military Operations in Urban Terrain
 - USMC Marksmanship training





FNWC Programatics

- There are PRODUCTS EVERY YEAR
- Sponsors/Customers get what they need and want: products have signed Transition Agreements with sponsors/customers.
- Overall Goal is a stable multi-year program that is:
 - Responsive to USN and USMC requirements
 - Responsive to customer needs and guidance
 - Defended by sponsors / customers / users, not S&T performers.



FNWC New Directions

- **Program planned and funded: FY 05 – FY 07**
- **Program Requirements and Plans for FY 08 – FY 13 in progress:**
 - **Strengthen HSI/HSE component**
 - **N1 manpower and personnel science & technology requirements process underway.**
 - **N00T training science & technology requirements process underway.**



Human Systems Integration Specialty Areas*

Human Factors Engineering	Manpower	Personnel	Training	Habitability	Survivability	Safety and Occupational Health
Human Performance	Workload	Recruiting	Knowledge, Skills and Attitudes	Quality of Life	Anti-Fratricide	Accident Avoidance
Human Interfaces	Wartime Requirements (Quality/Quantity)	Selection	Initial Skill	Quality of Work	Personnel Protection	Safety Hazard Avoidance
Human Error Avoidance	Peacetime Requirements (Quality/Quantity)	Classification	Skill Progression	Environmental Limits and Controls	Damage Control	Health Hazard Avoidance
Top Down Analysis	Officer, Enlisted and Civilian	Retention	Functional	Personnel Services	Performance Effects of Ensembles	Risk Mitigation
Design for Usability	Force Structure	Career Progression	Individual and Team			Medical
Design for Maintainability	Operating Strength	Skill Mix	Training Concepts			
		Special Skills	Delivery Systems			
		Occupational Standards	Organic Training			
		Distribution	Embedded Training			
		Manning Concepts	Distance Learning			
			Virtual Environment			
			Intelligent Tutoring			

TRADE-OFF ANALYSES

ENHANCE TOTAL SYSTEM PERFORMANCE WHILE REDUCING LIFE-CYCLE COST

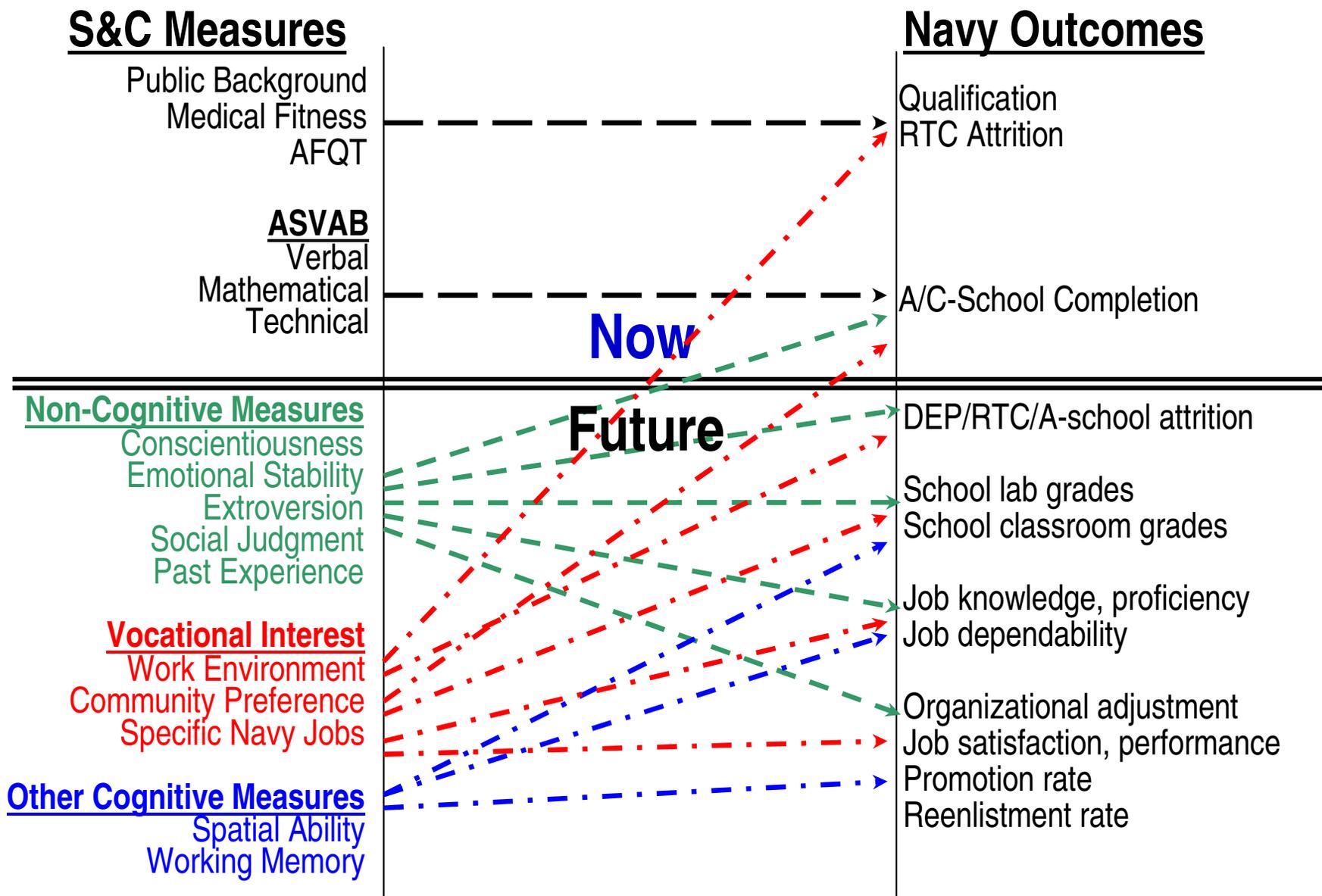


FNWC Supporting Technologies

- **MANPOWER AND PERSONNEL**
 - Whole Person Assessment (WPA)
 - Sailor / Marine Career Management System (S/MCMS)
 - Personnel Situation Monitoring, Analysis and Response Technologies (P-SMART)
- **TRAINING**
 - Human Performance and Assessment for Distributed Learning (HP&A)
 - Virtual Environments and Technologies (VIRTE)
 - IMAT Visualization Based Training (IMAT-VISTRA)
- **HUMAN FACTORS/HSI**
 - Advanced Interface Design / Training Capability (AID/TC)



Whole Personnel Assessment





Sailor/Marine Career Management System

- **Create a network-centric personnel distribution and assignment system**
 - **that uses a market-based approach to job assignment**
 - **provides incentives for hard-to-fill jobs**
 - **makes more informed job matches**
 - **increases Sailor satisfaction with the assignment process**



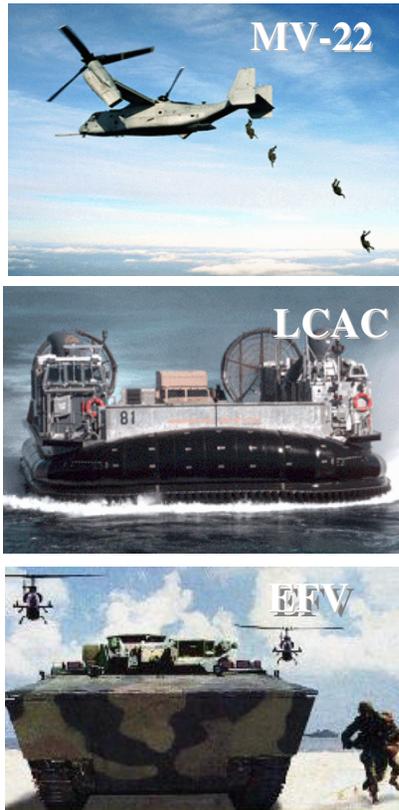
P-SMART Objectives

Build N-1 “CIC” for Navy Personnel Environment

- Advanced “**early warning**” system
 - Identify potential problems and opportunities
- Executive flight simulator / war game
 - “What-if” analysis to evaluate alternatives
- Credible tool for developing budget justifications
- Training platform for decision makers
 - Facilitate in-depth understanding of the enterprise

VIRTE

Virtual Environments for Training



Demo I (Done)
Expeditionary

VEHIT
MOUT/AT IP

MOT²IVE
Multi Platform/Full Spectrum

FY 02

03

04

05

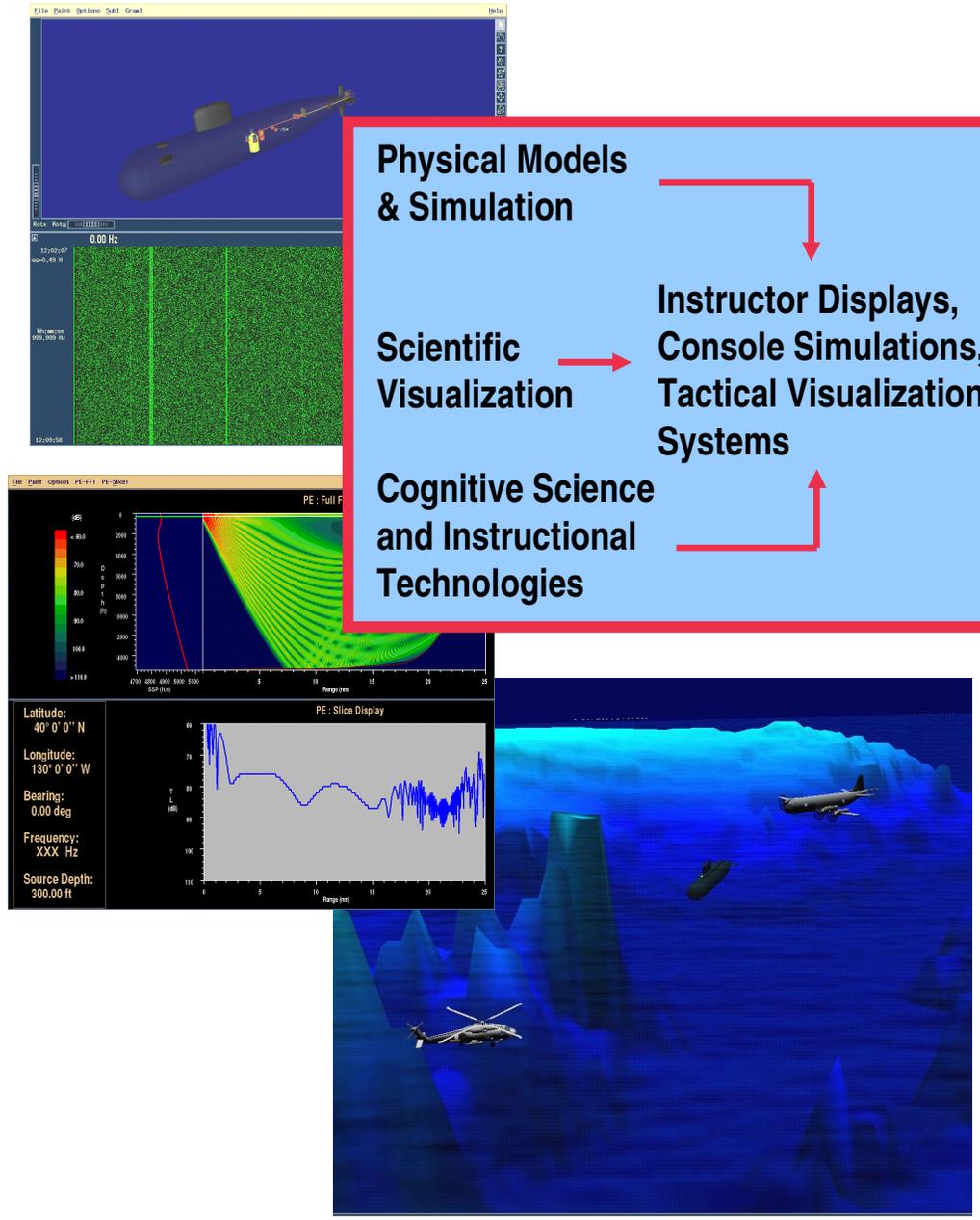
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07



VIRTE

- **Develop and demonstrate leap ahead human-immersive technology for Naval training**
- **Supplement & complement live training using virtual & wargaming simulations**
- **Train warriors for ever increasing complexity & chaos**
- **Achieve significant time and cost savings**
- **Increase human performance by matching technologies and training strategies to requirements**
- **Rapidly transition superior technology to Naval training systems for decisive military capability**



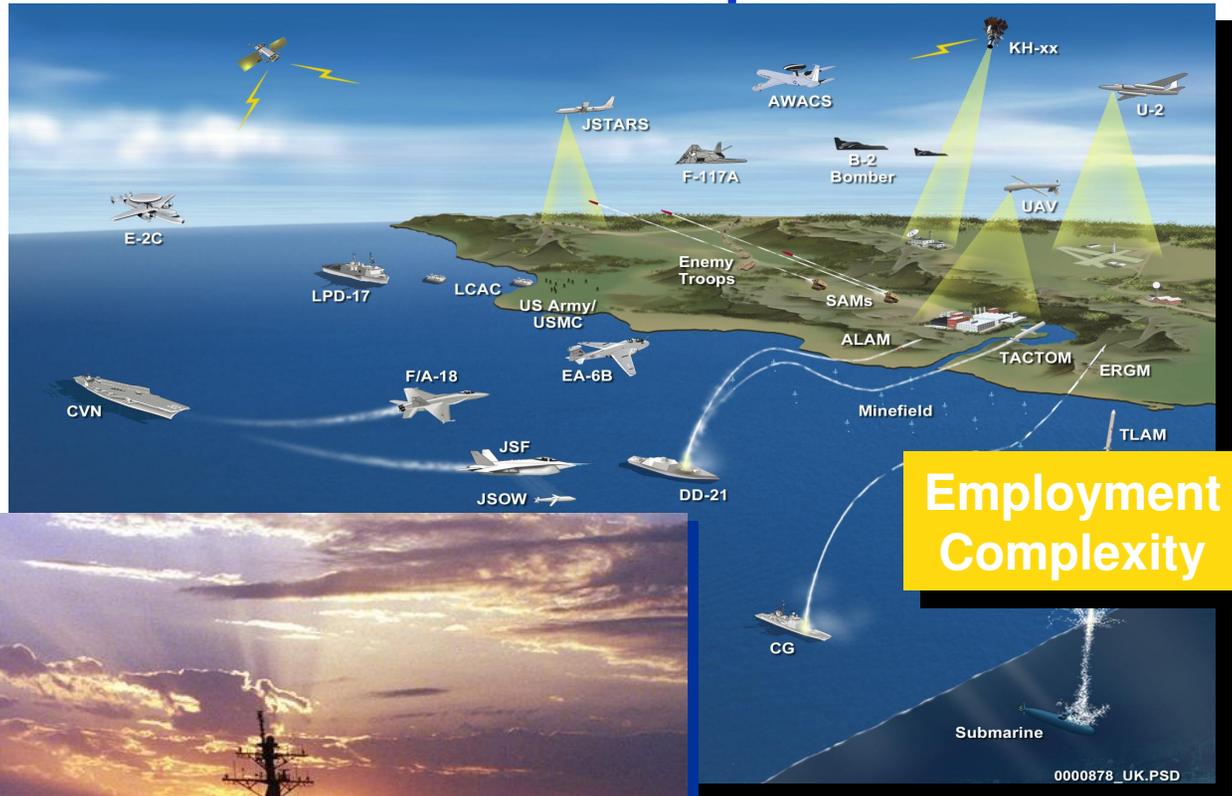
- Use physics-based models and databases to create tactically relevant visualizations
- Embed these in training systems:
 - Provide physically accurate, high-fidelity models and simulations with explanation and practice designed to promote efficient skill acquisition
 - Support relevant practice and rehearsal with realistic environmental complexity
 - Develop deployable and web-enabled training for sonar operations and tactical employment aboard submarines and other platforms
- Extend approach to Fleet performance support systems and in networked training systems
- Use build-test-build spiral development with frequent at-sea try-out

Advance Interface Design and Training Capability (AID/TC)

The Challenge of Future Tactical Land Attack Operations



New Shipboard Weapons & Land Attack Capabilities



Employment Complexity



Space and Manning Constraints





Human-Centered System Design

- **Evolve TTWCS with an HSI that supports the operator rather than the system**
 - **Improve operator Combat Effectiveness**
- **Lead the way toward a common presentation layer spanning multiple Land Attack Systems**
 - **TTWCS integral to Land Attack Combat System**
 - **Common Look and Feel implementing Task Centered Design**
- **Implement with an architecture which is extensible to other Land Attack Systems**
 - **Transform current HCI into a real Presentation “Layer” that is consistent with Land Attack vision outlined by Land Attack CIPT.**



CM Future Naval Warfighter Capabilities

- **S&T base for Naval Manpower, Personnel, Training, and Human Systems Integration Technologies**
- **Supports Naval requirements**
- **Demonstrated ability to transition**