

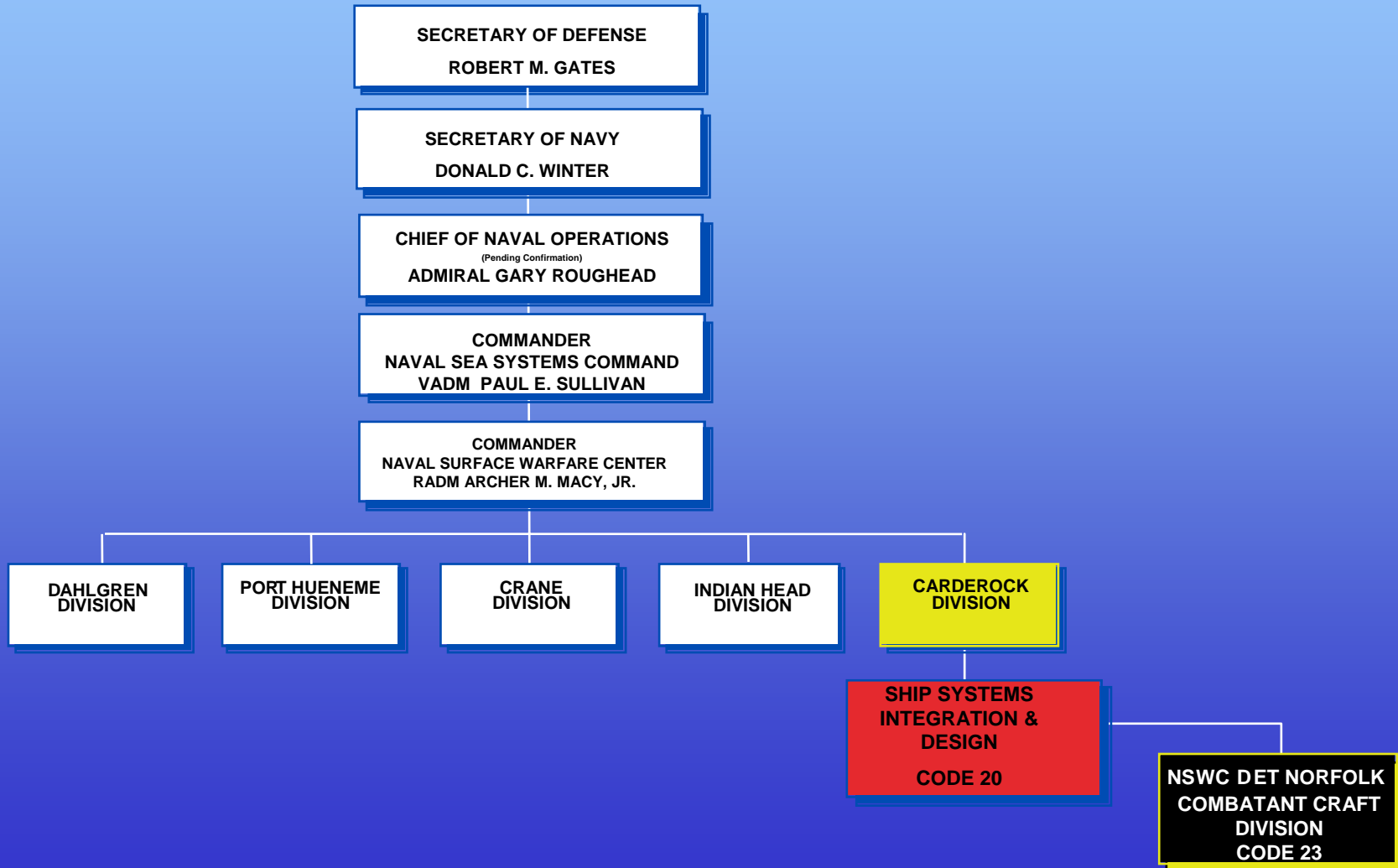
HIGH SPEED CRAFT for DoD



Mack Whitford, P.E.
NAVSEA Technical Warrant Holder
Combatant Craft and Boats

NSRP September 26, 2007

ORGANIZATIONAL STRUCTURE



Full Life Cycle Full Spectrum



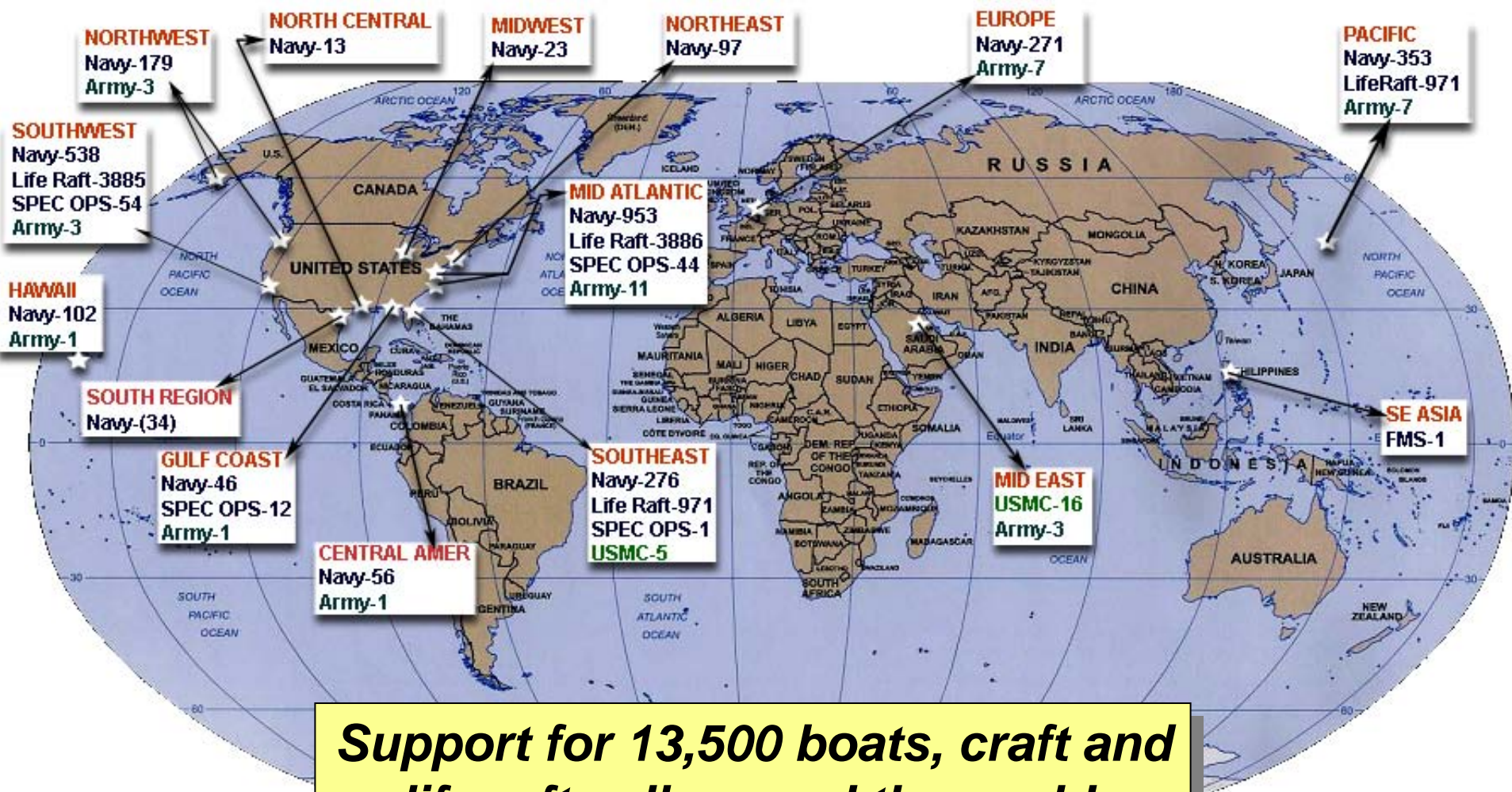
Total Craft Systems

DoD Boat and Craft Experts

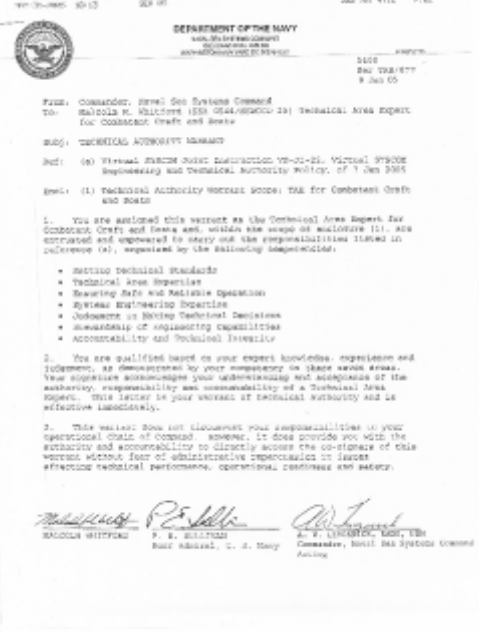
- Maximize Boat / Craft Lessons Learned across DoD community
- Combined Resources for Improved Efficiency
- Technology Transfer
- Minimize Redundancy



WORLD-WIDE SUPPORT



Support for 13,500 boats, craft and life rafts all around the world.



Technical Authority Warrant Scope: TAE for Combatant Craft and Boats

The scope of this warrant includes:

- **Full Life Cycle/Full Spectrum/In-Service responsibilities for Combatant Craft and Boats** including Life Rafts, Patrol Coastal Ships, Seaborne Targets, High Performance Craft, other Watercraft and associated HM&E and Mission systems, subsystems and equipment.
- **Total platform systems engineering for combatant craft and boats**, including: Mission Systems Integration; Science and Technology; Research and Development; Test and Evaluation; Design; Acquisition; Smart Buyer; Construction Technical Support; Integrated Logistics Support; Design Management; Life Cycle Management; Technology Advancement and Transfer; In-Service Engineering; Repair, Modification and Modernization support; Fleet Support; regulatory compliance throughout the lifecycle; and ensuring contract administration and oversight.

BOATS/CRAFT vs. SHIPS

Boats and craft are typically much more sensitive to seemingly minor non-conformances than ships in areas such as stability, performance, sea keeping, safety, reliability, maintainability, signatures, structural integrity, transportability, interchangeability, supply support and durability.

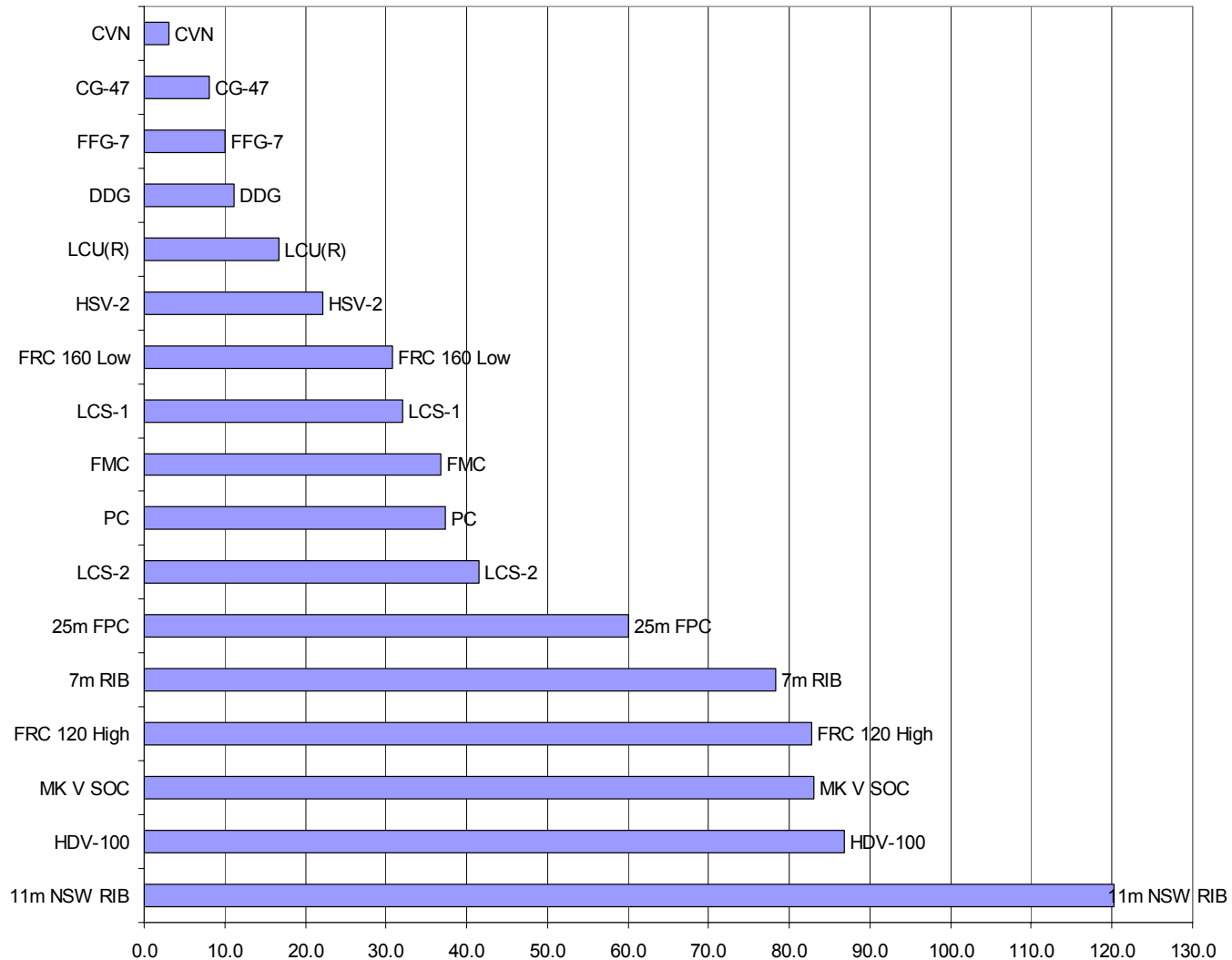
- **Operational Environment: Severe, Design Constraints**
- **Hull Designs**
- **Hydrodynamic Analyses: Resistance, Speed, Power, Sea keeping Predictions**
- **Stability Analyses: Static and Dynamic Calcs, Inclining Experiments, and Flotation Tests**
- **Mass Properties: Detail/Specific vs Parametric**
- **Well deck launch and recovery, internal air transport, over the road restrictions, davit/crane interface, stern ramp launch and recovery.**

- **Material of Structures: Fiber-Reinforced Plastic (FRP), Aluminum, Steel and Wood**
- **Arrangements: Space/Weight Constraints; Ergonomics**
- **System Integration: Small, Multi-functional, Little Redundancy**
- **Life Cycle: Shorter Design, Construction, and Service Life**
- **Construction Inspection: Fabrication Techniques, Construction Details, and Material Expertise**
- **Small Business Builders and Boatyards with Little or No Engineering Experience, Expertise**

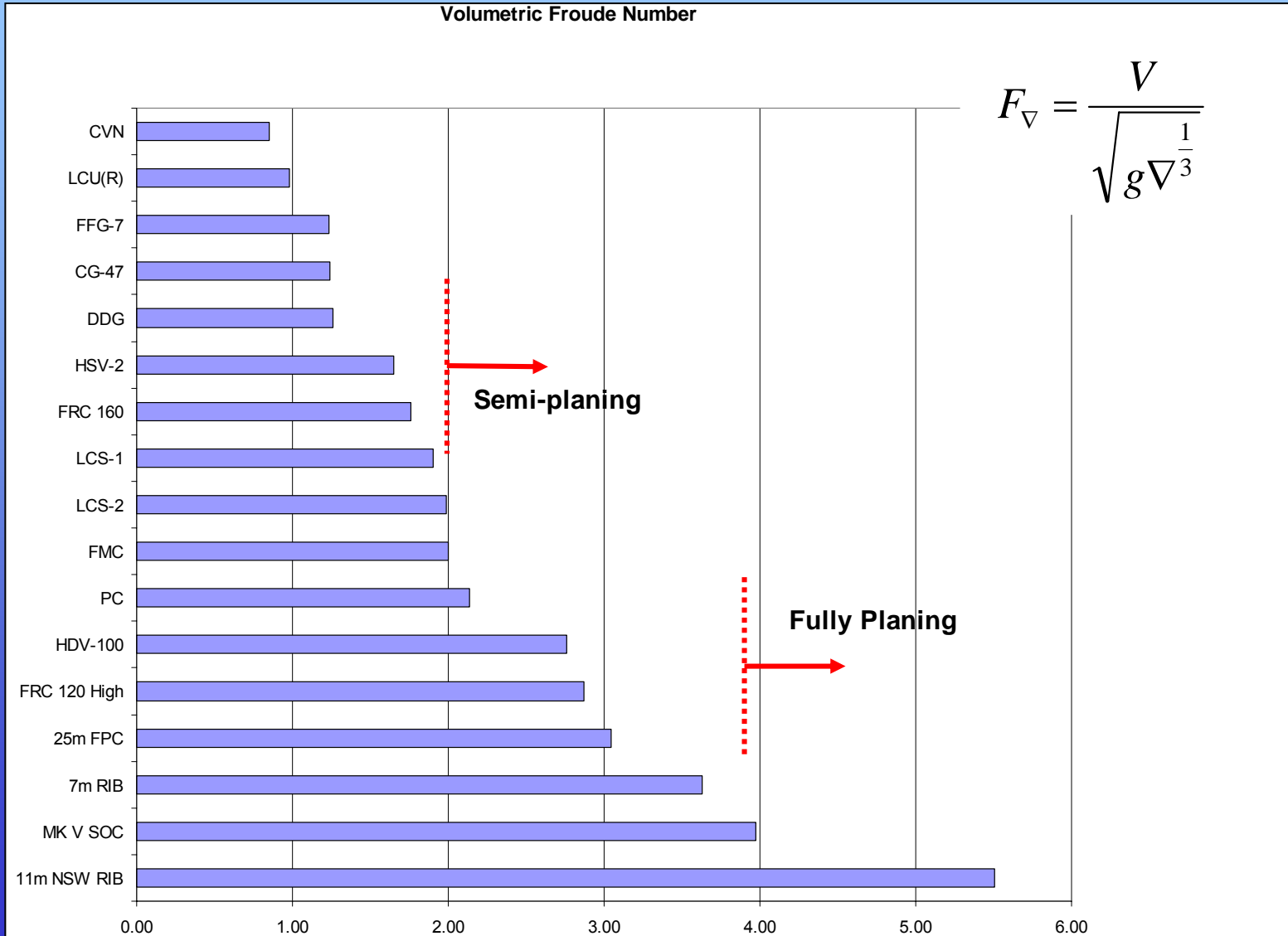


BOATS/CRAFT vs. SHIPS

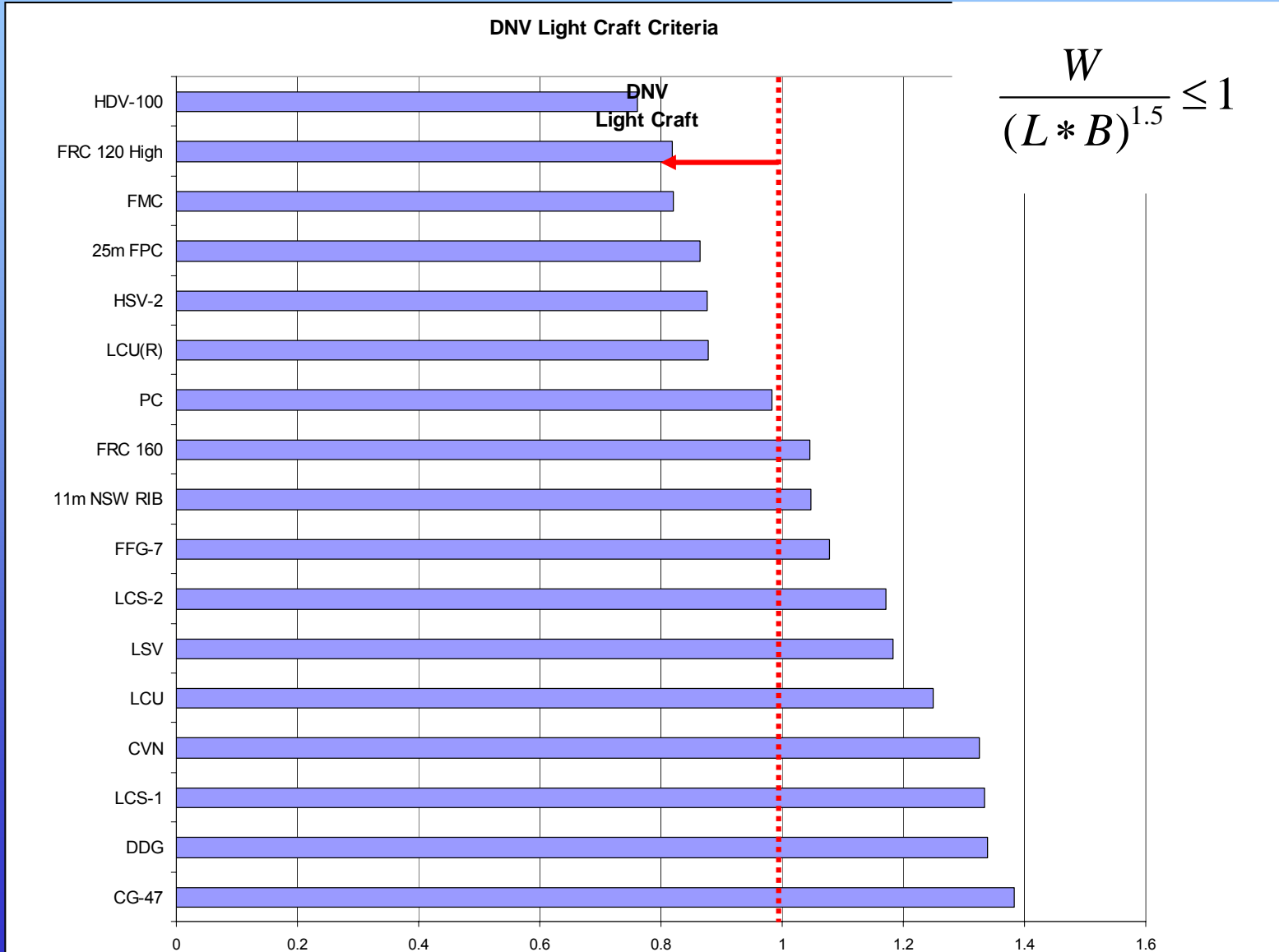
Horsepower per Long Ton of Displacement



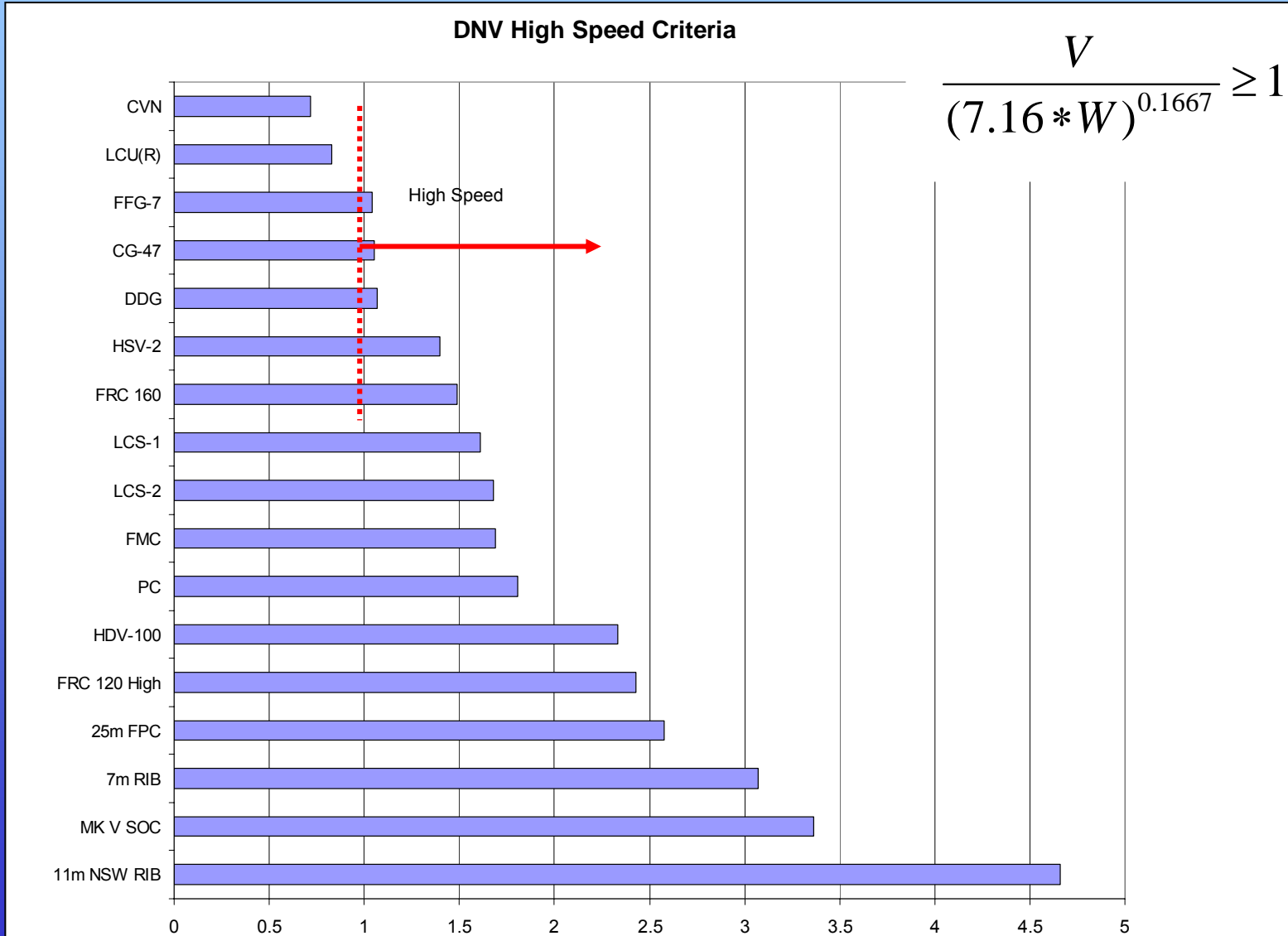
BOATS/CRAFT vs. SHIPS



BOATS/CRAFT vs. SHIPS



BOATS/CRAFT vs. SHIPS



MISSIONS & CAPABILITIES SUPPORTED



NECC BATTLESPACE





UNMANNED SURFACE VEHICLES



PATROL MISSIONS



What are the implications of these missions and capabilities in terms of hardware and technology?

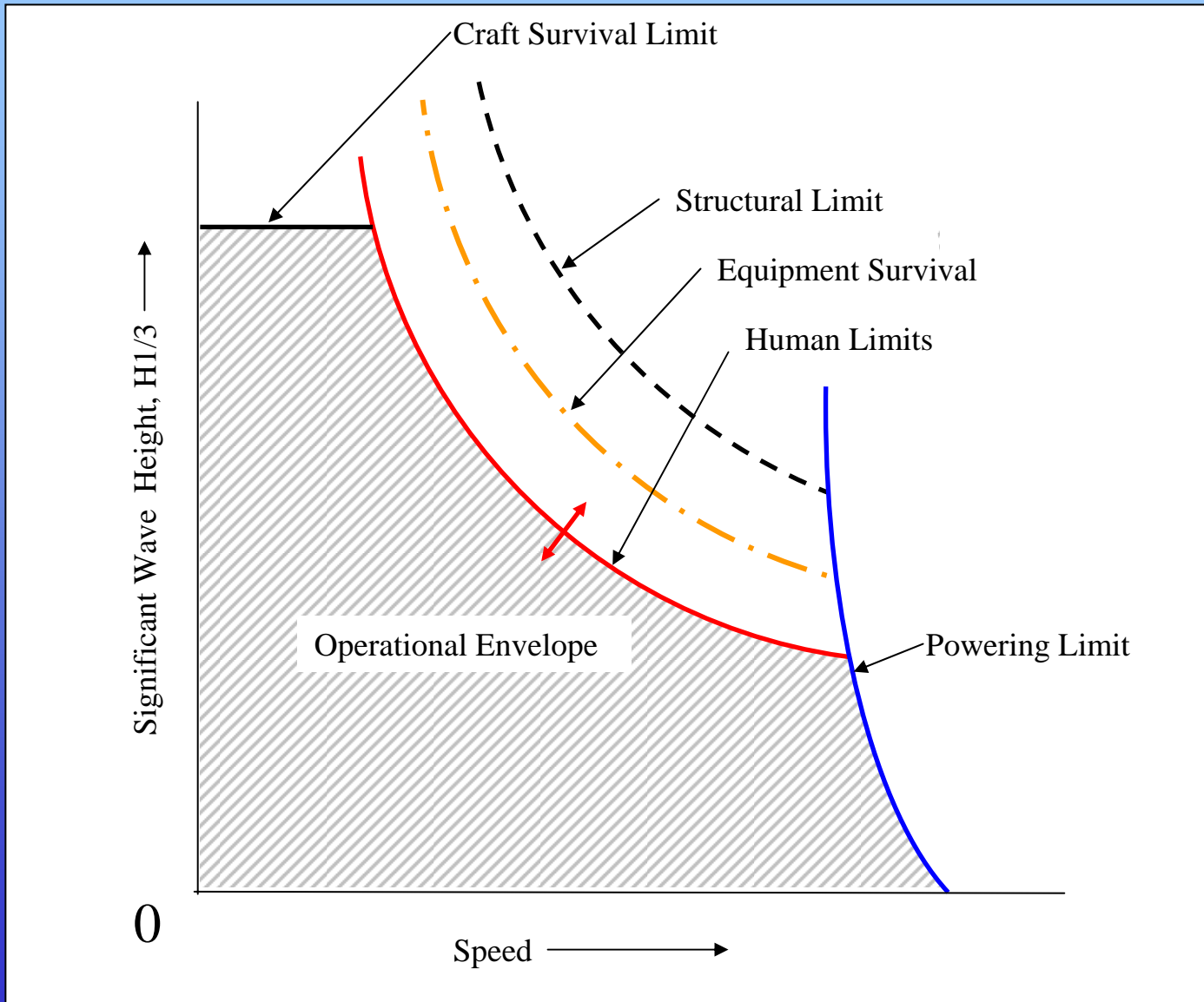
- Cost vs Capability
- Reduced Manning
- Matching Capability to Requirements
- Short Timelines; Little or No Development
- Ruggedized Versions of Proven Technology
- Protected Against Harsh Craft Environment
- Adapting to Regulatory Constraints on COTS Equipment
- New Predictive and Analytical Tools Suited to Craft
- Innovation – Not Necessarily Radical Departure from Known
- Cost Saving, Quality Improving Production Techniques

A Better Understanding of the Human Part of the System is Essential

- Hardware Capability is Regularly Exceeding Human Limits
 - Reduced Manning
 - Higher Functionality
 - Information Overload
 - Motion Related Effectiveness
 - Motion Related Injury



HARDWARE & TECHNOLOGY NEEDS



Questions?

