



UNCLASSIFIED

Climate & Energy Symposium

Johns Hopkins University

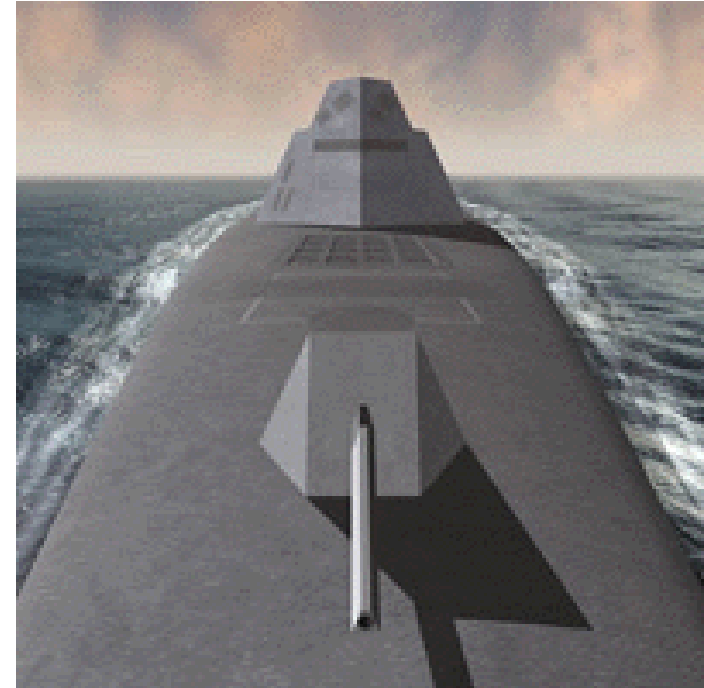
Howard Fireman
Deputy Director, Programming Division (N80)
29 March 2011

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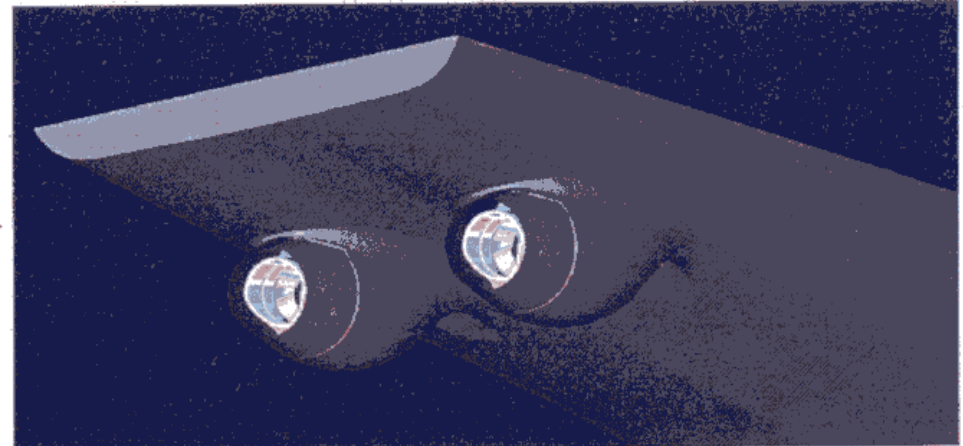
- Potential Capability Objectives
- Strategic Guidance & Implementation Options
- Energy Requirements and Implementation
- Climate Considerations



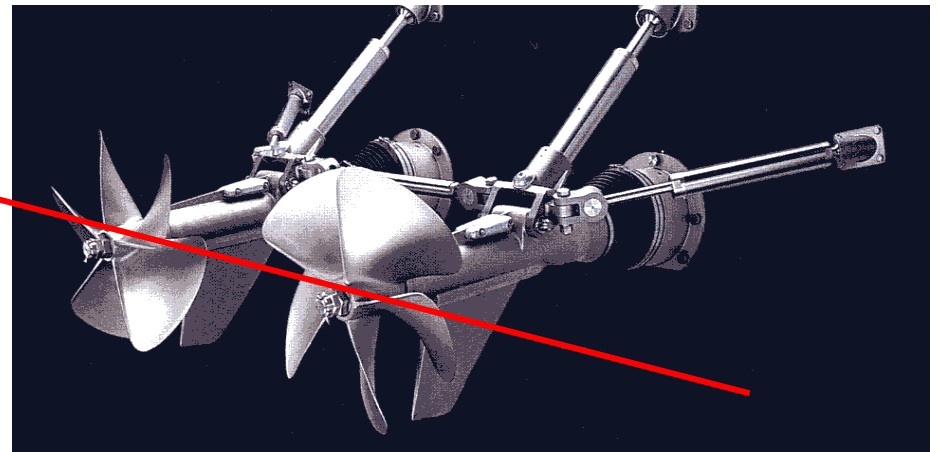


If your objective is: **HIGH SPEED**

- High Speed Hull-forms
- Improve Prime Mover Efficiency
- Improve Propulsor power capacity and efficiency
- Light Weight Structure



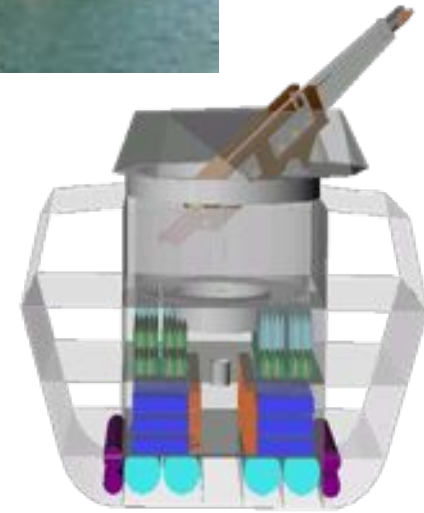
Isometric view of AWJ-21™ integrated into hull





If your objective is: SURVIVABILITY

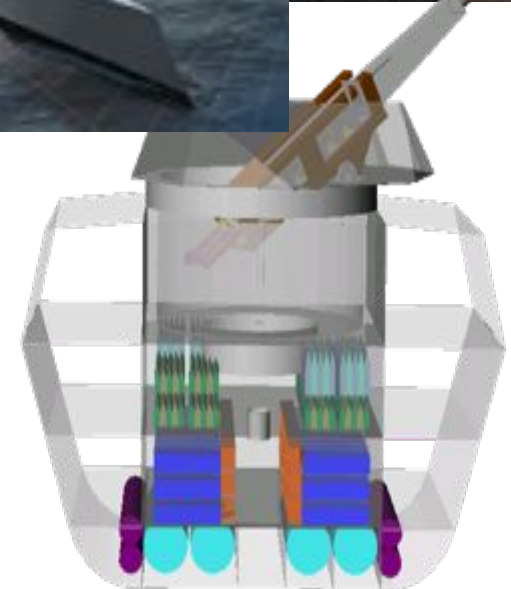
- Don't get Hit
- Retain functionality after hit
- Eliminate Energetics
- Improve Structures
- Improve damage control and fire-fighting





If your objective is: MISSION EFFECTIVENESS

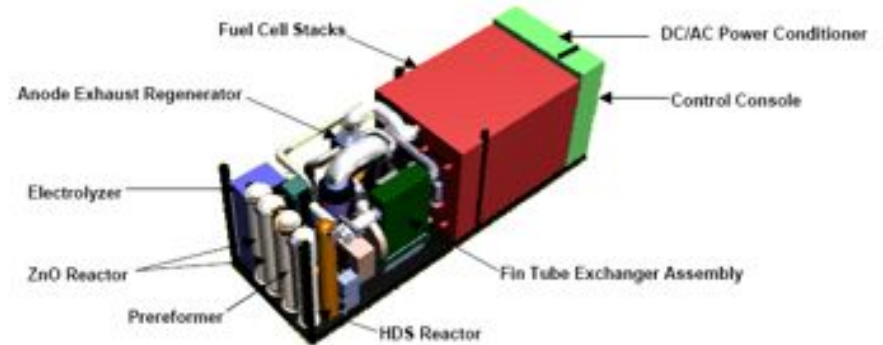
- Improve performance of Mission Systems
- Improve Quality of Service of distributed systems.
- Time on Station
- Improve capacity of network/unmanned operations
- Improve onboard training by use of simulation vice underway activities



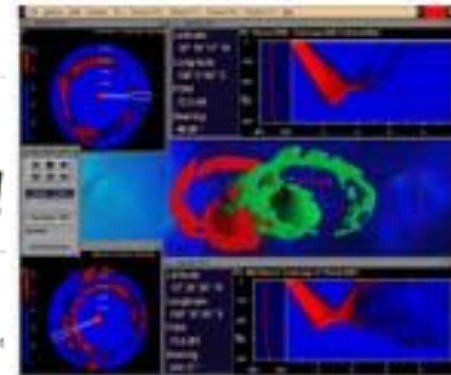
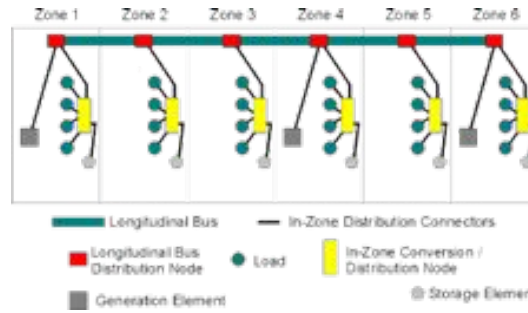


If your objective is: *LCC REDUCTION*

- Reduce Manning
- Reduce Fuel Costs
- Eliminate unnecessary redundancy
- Condition Based Maintenance
- Onboard training simulators vice time U/W
- Improve reliability of least reliable equipment.

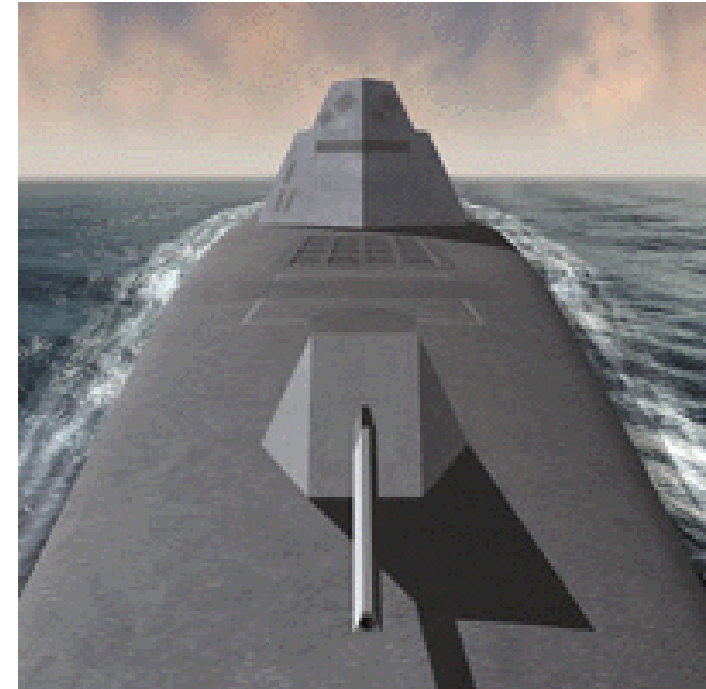


FuelCell Energy 625kW 450V, 3φ, 60 HZ, MC SSFC Power System



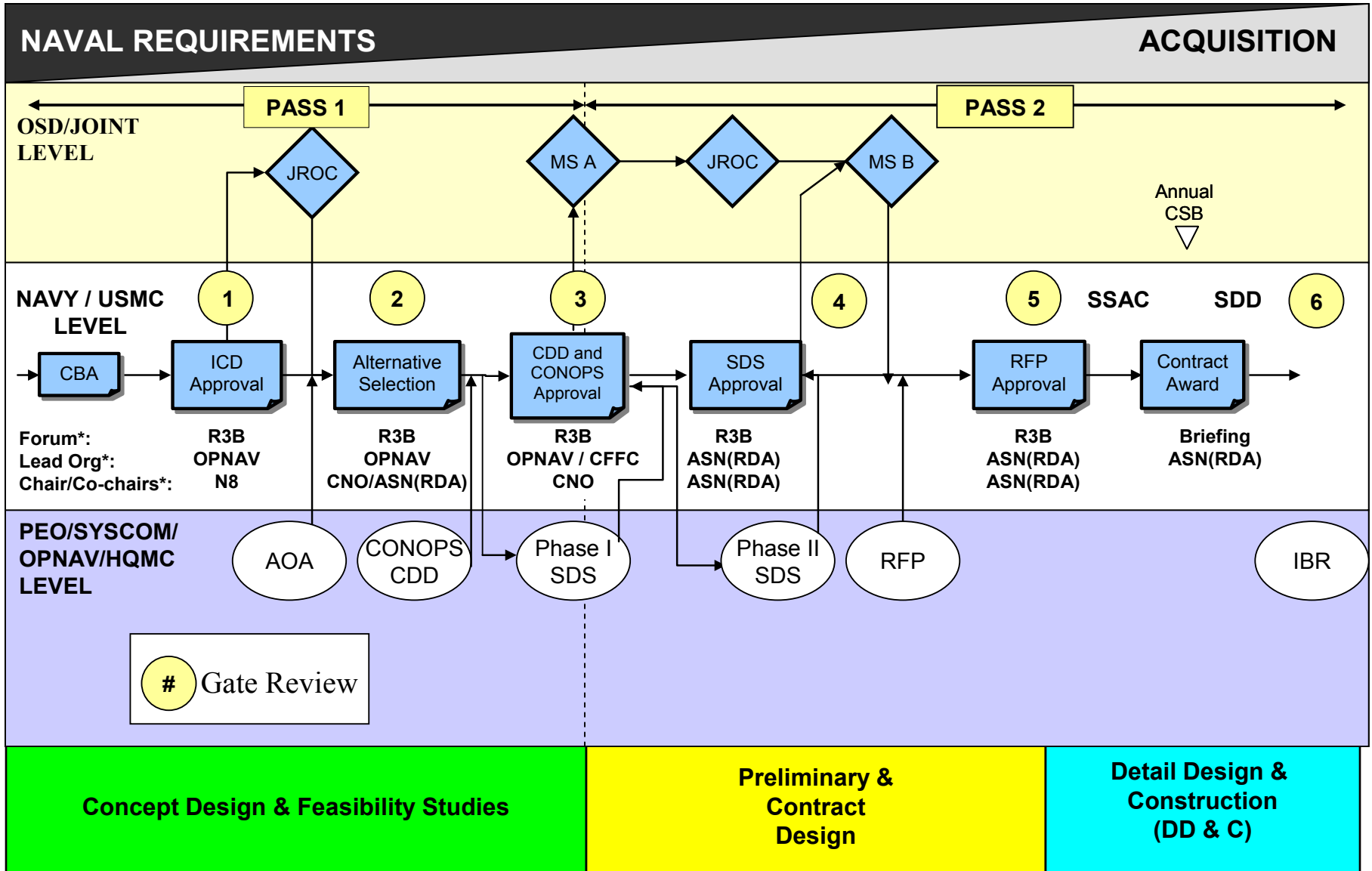


- Potential Design Objectives
- **Strategic Guidance & Implementation Options**
- Energy Requirements and Implementation
- Ship Design Challenges
- Climate Considerations



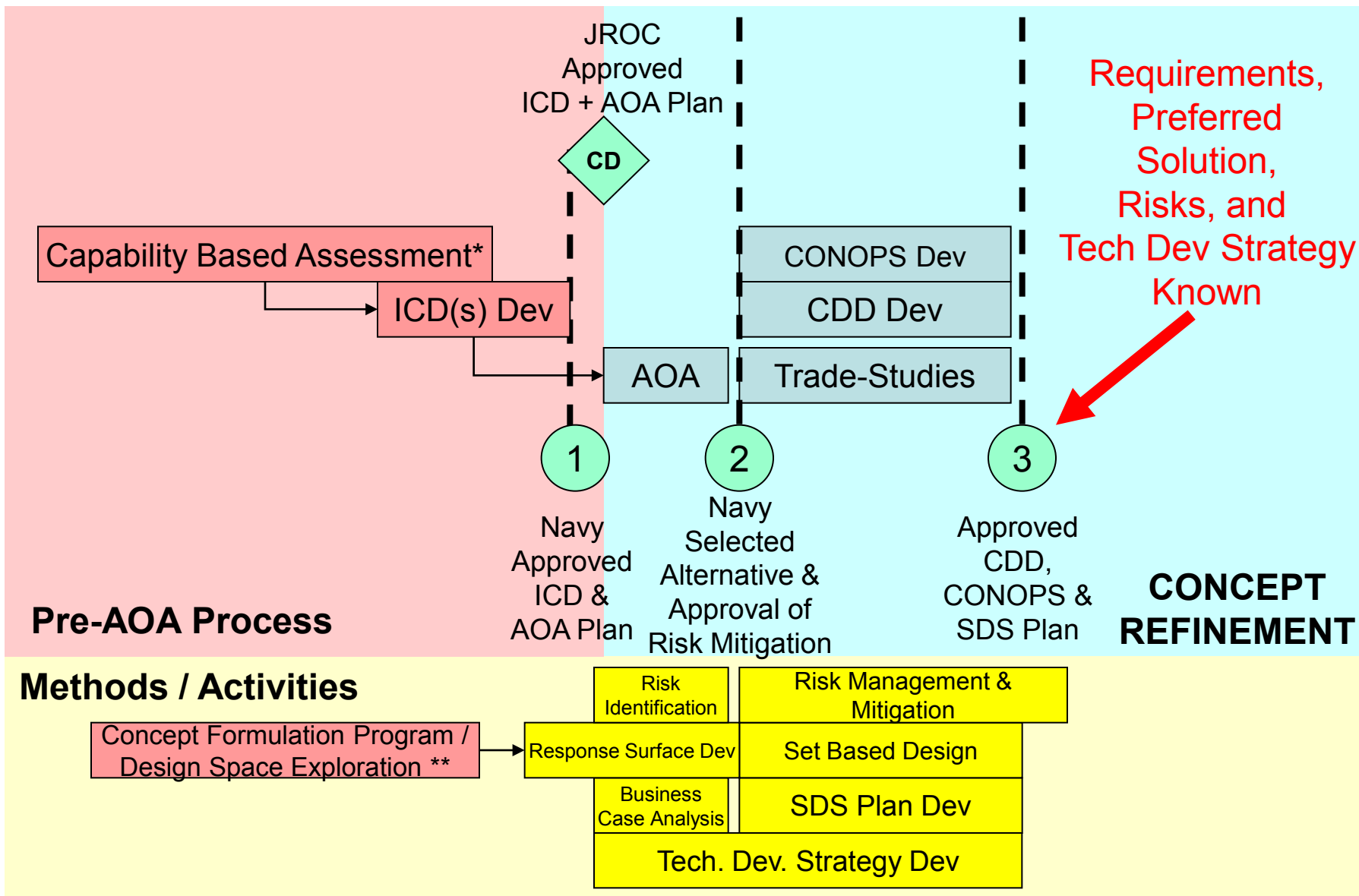


SECNAVINST 5000.2D





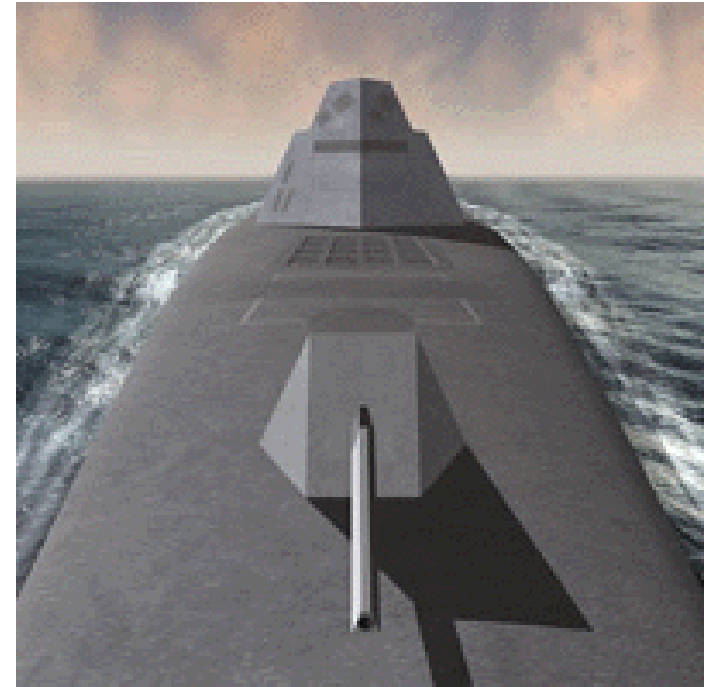
SECNAVINST 5000.2D – PASS 1:





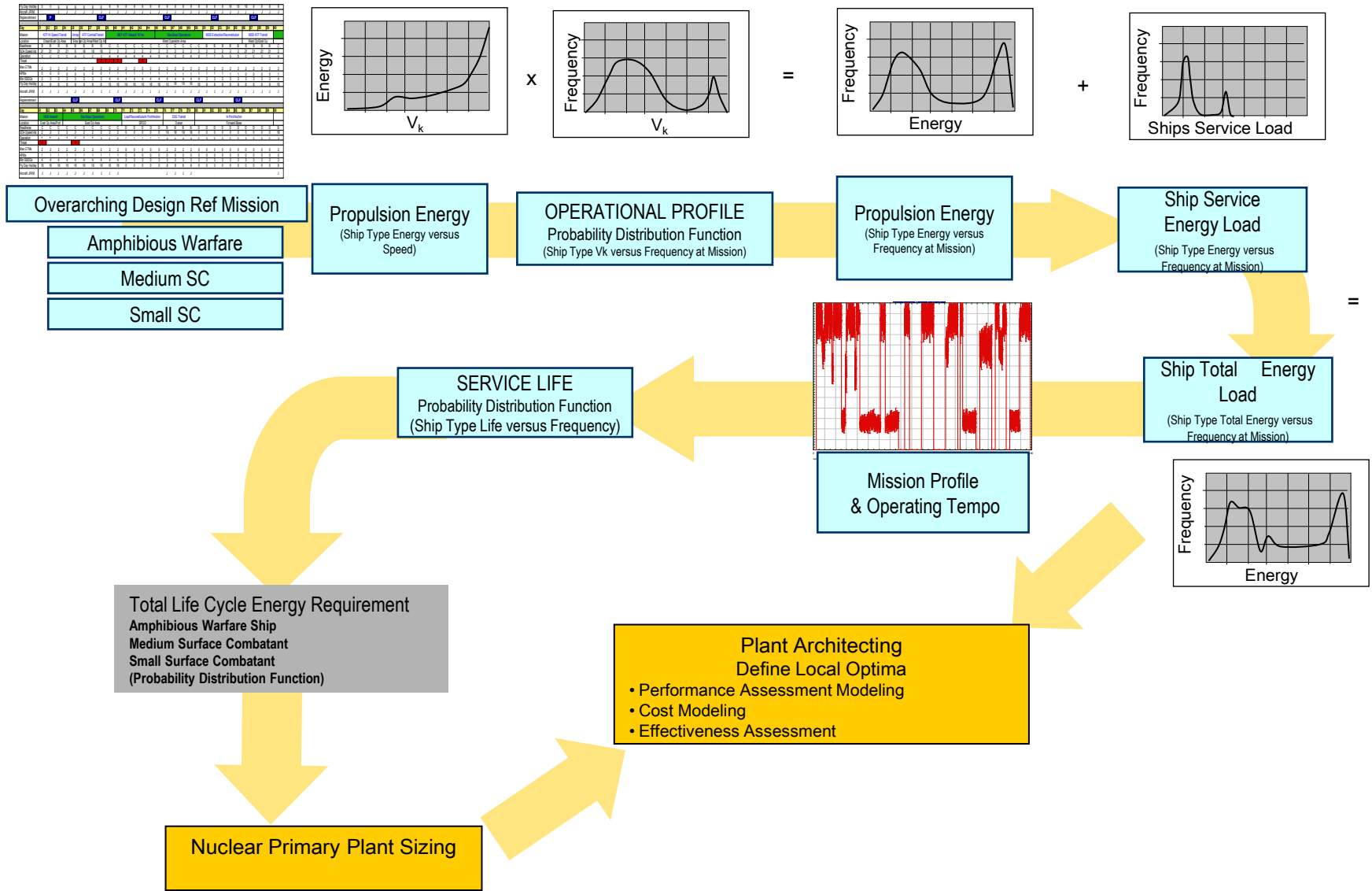
Agenda

- Potential Design Objectives
- Strategic Guidance & Implementation Options
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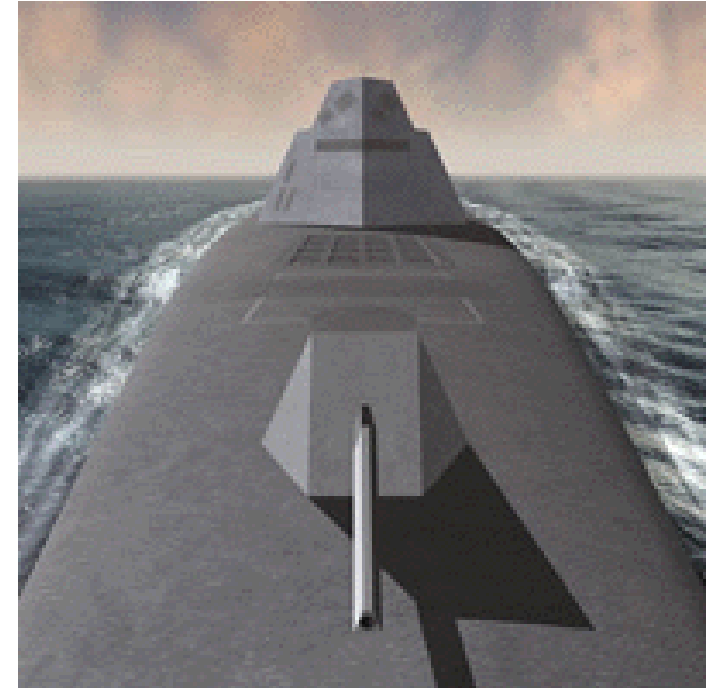
Energy Requirements



Plant Architectures Driven by Lifecycle Ship Mission Profiles

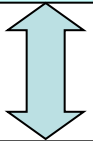
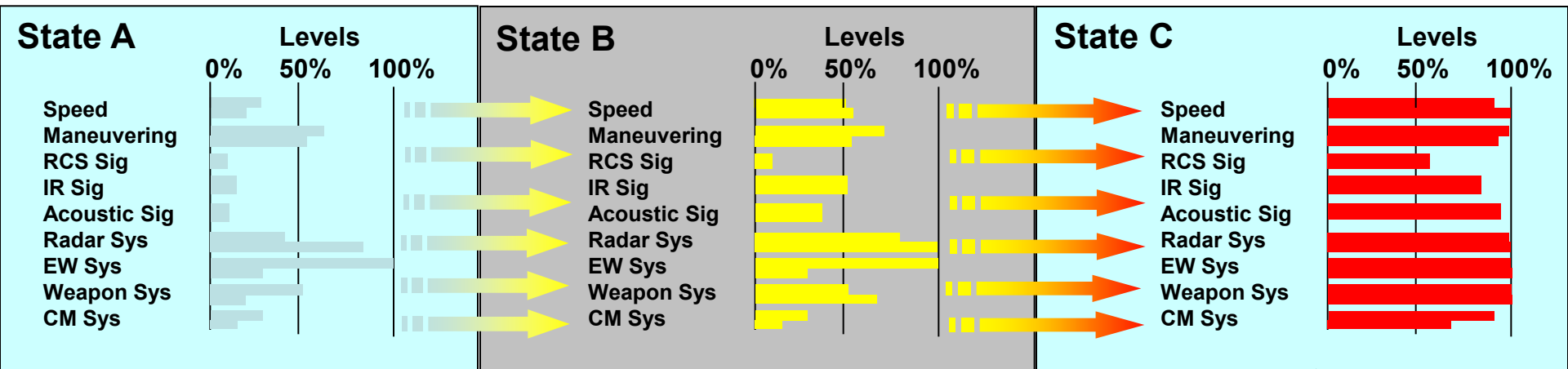


- Potential Design Objectives
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- **Ship Design Challenges**
- Climate Considerations

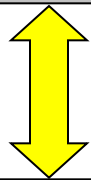




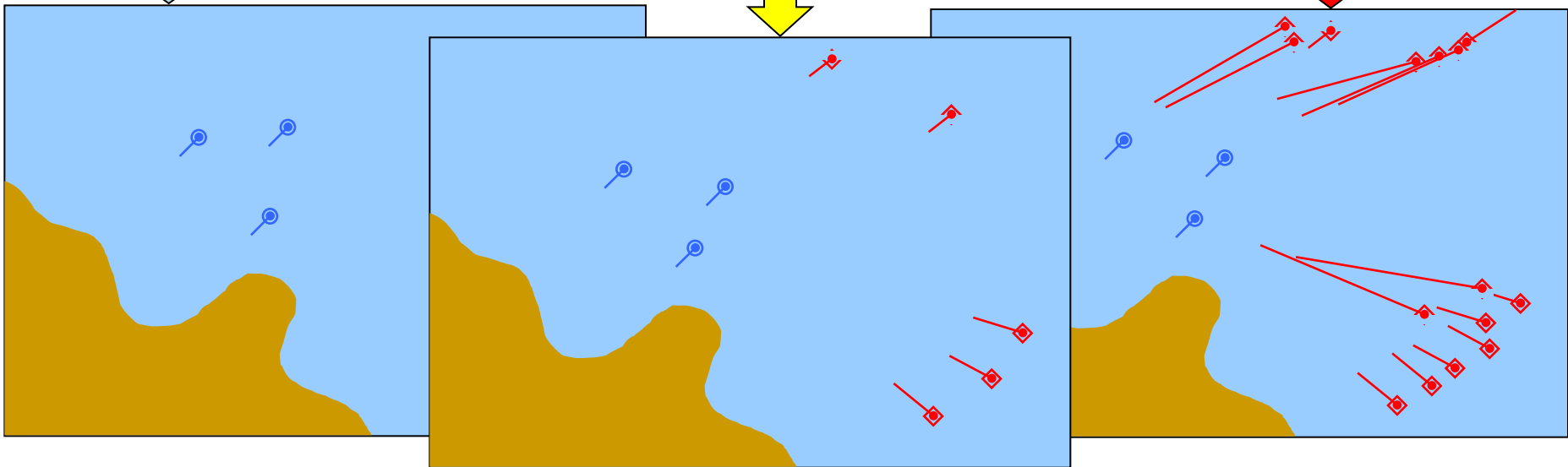
Approach: Energy System Sufficiency vs Energy Requirements



State Transitions:
Time, Power, Systems



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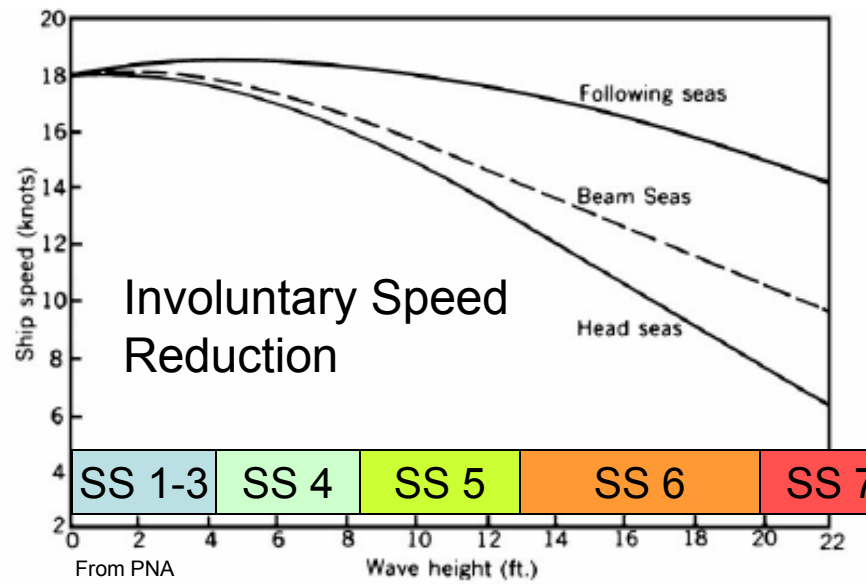




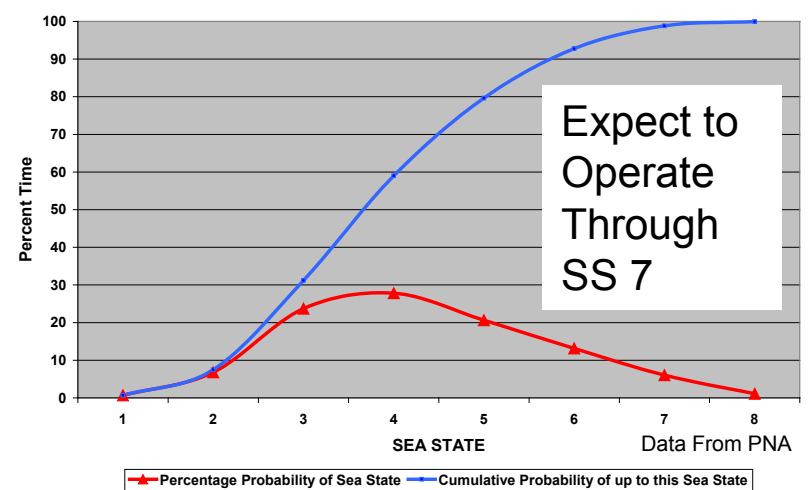
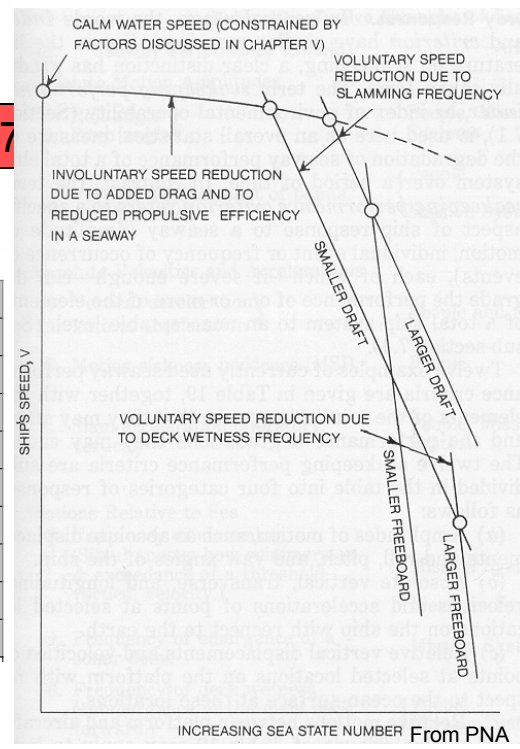
Sizing Power Generation: Impact of Sea-State

- Involuntary speed reduction
 - Depends on Direction of seas and wind

- Voluntary speed reduction
 - Slamming
 - Deck wetness

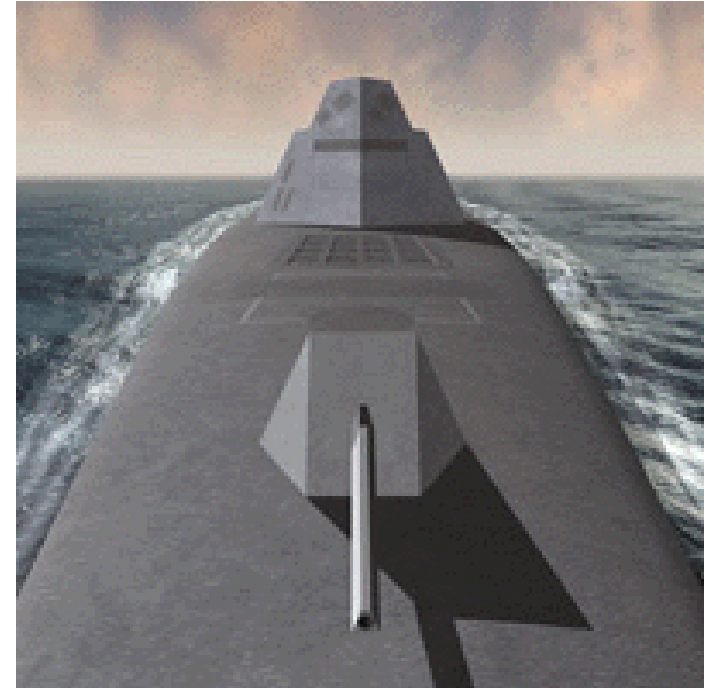


Voluntary Speed Reduction





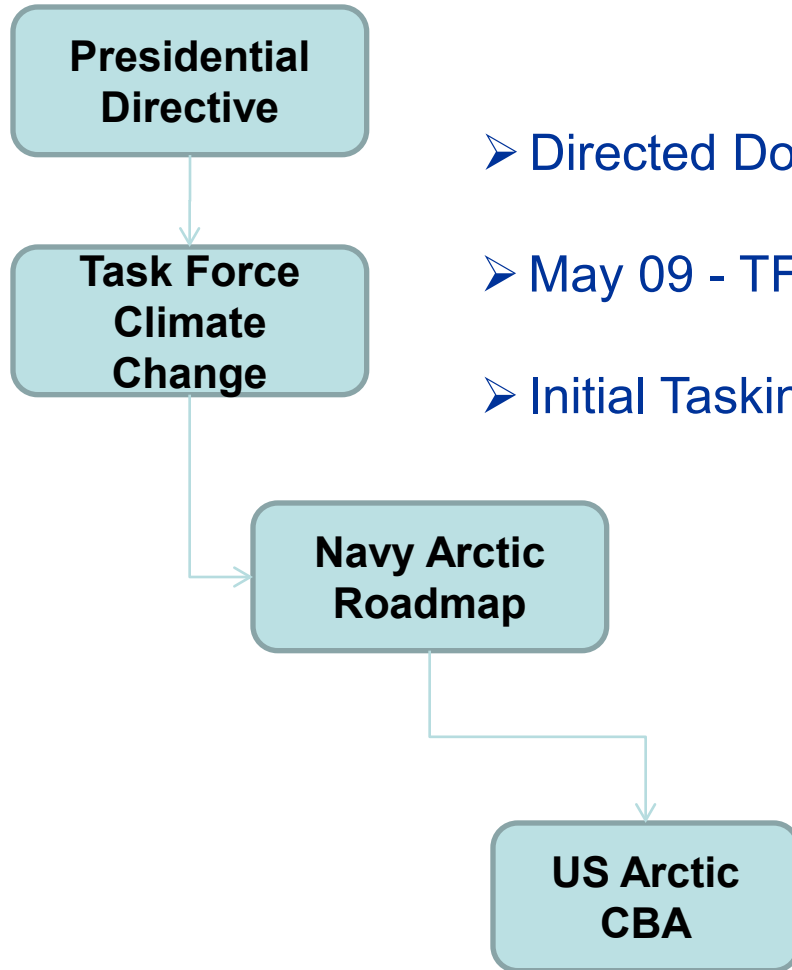
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Navy Arctic Efforts

- Jan 09 - NSPD 66 / HSPD 25 – Established Arctic Policy for US
- Directed DoD to develop greater capabilities in the Arctic
- May 09 - TFCC Established by CNO
- Initial Tasking – develop roadmap for Navy Arctic needs

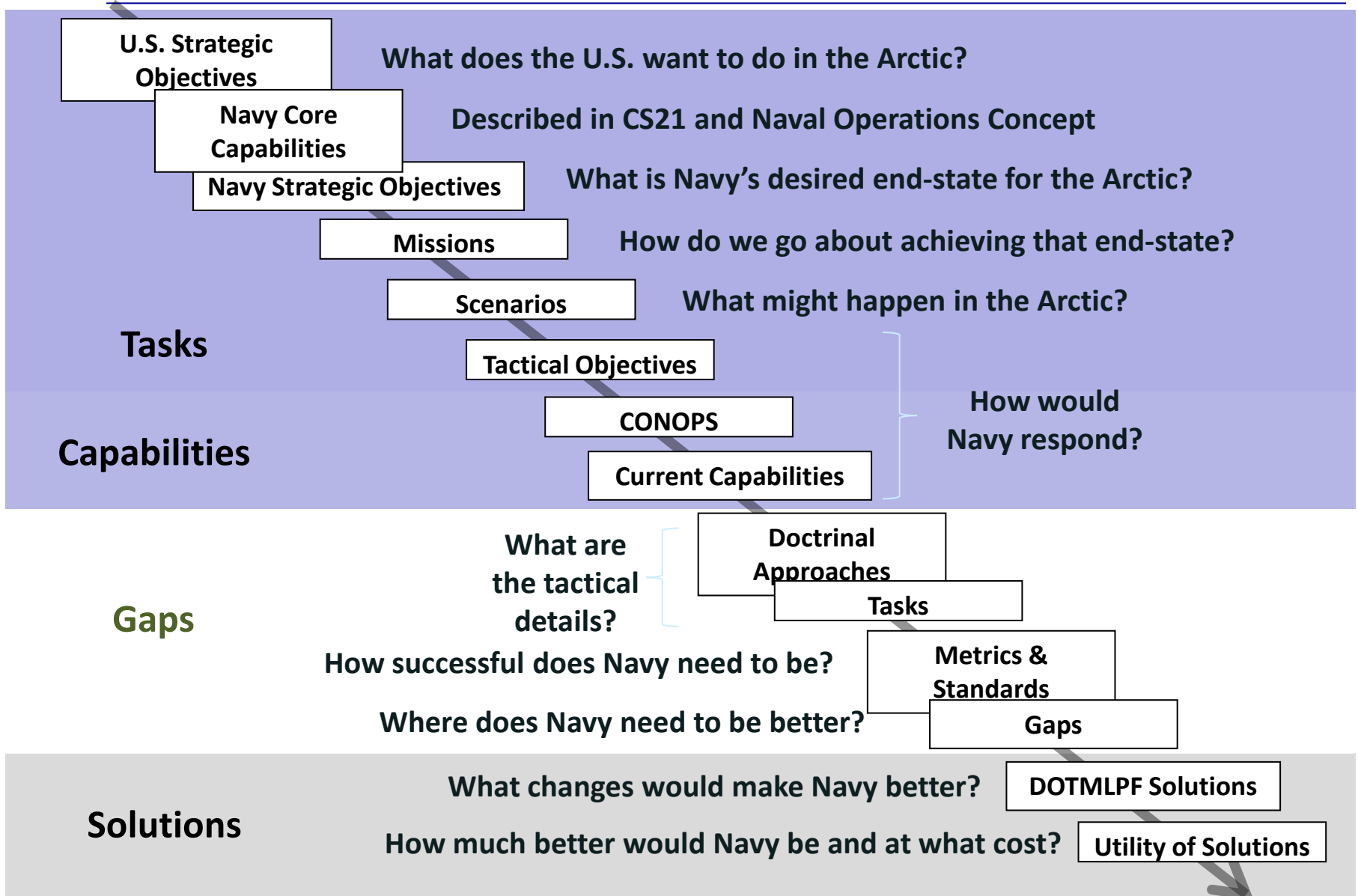


FY11-12 Actions include:

- “Initiation of Capabilities Based Assessments regarding required Navy Arctic capabilities”
- “Formalizing new cooperative relationships that increase Navy experience and competency ... in the Arctic”

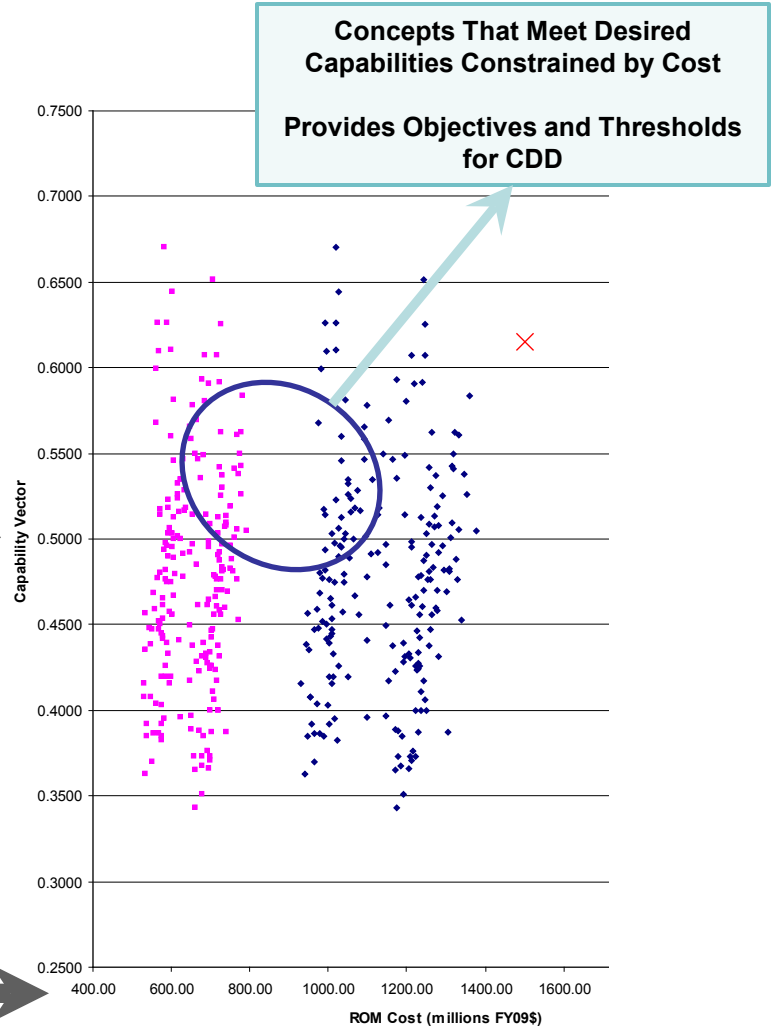
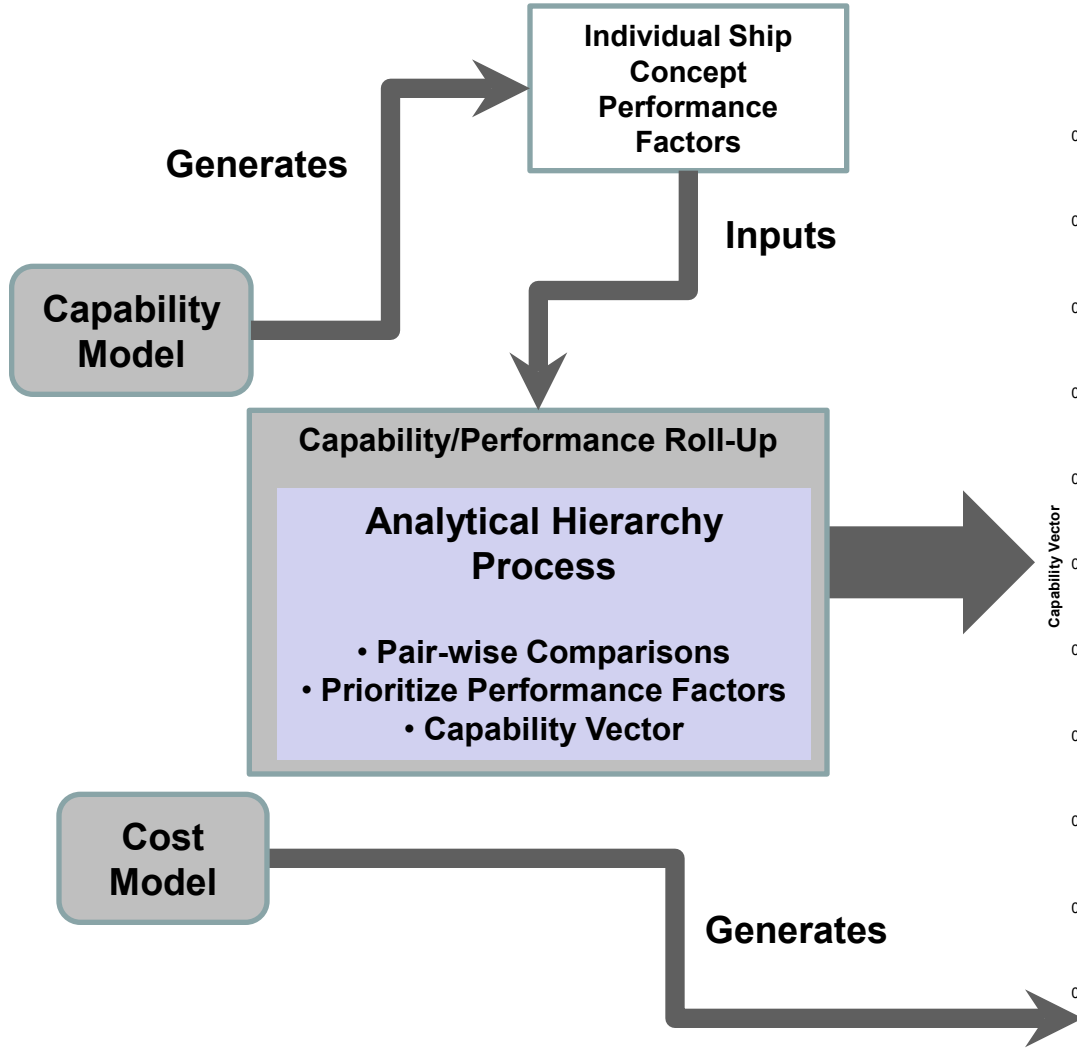


Arctic Capabilities Roadmap





Capability vs. Cost Analysis





Questions