Winning the Race:

A Naval Fleet Platform Architecture for Enduring Maritime Supremacy

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Background

- Between 2001 and 2004, Congress became increasingly frustrated over constant changes to the rationale behind the Department of the Navy's fleet operational architecture requirements, and the associated Battle Force shipbuilding plans
- At the urging of Representative Roscoe Bartlett (R, MD), Congress considered mandating a variety of independent analyses to help identify future fleet operational architecture and shipbuilding requirements
- As a result of these deliberations, on November 24, 2003—as part of the Fiscal Year 2004 (FY2004) Defense Appropriations Bill (House Resolution 1588, passed as Public Law 108-136)—the Secretary of Defense was tasked to submit to Congress two ***"Naval Fleet Platform Architecture Studies"*** in January 2005
- The Law directed that one of the studies be conducted by the Office of Force Transformation (OFT), Office of the Secretary Of Defense (OSD), and the other by an independent Federally Funded Research and Development Center (FFRDC)
  - In the event, the study was assigned to the Center for Naval Analysis (CNA), an FFRDC managed by the CNA Corporation, headquartered in Alexandria, Virginia

CSBA Naval Fleet Platform Architecture Study

- **Purpose**
  - Provide Congress with a third alternative future naval fleet platform architecture, with supporting rationale and an associated transition roadmap
- **Goal**
  - Design a naval fleet platform architecture that can:
    - Prevail over any potential traditional, irregular, disruptive or catastrophic challenge and/or challenger over the long term, thereby maintaining enduring US naval supremacy; and
    - Be built and maintained on a ***target steady state total shipbuilding budget (Ship Construction, Navy (SCN), National Sealift Defense Fund (NSDF), and major conversions) of $10 billion a year (Fiscal Year 2005 constant dollars)***
- **Approach**
  - Complement expected CNA campaign analysis and OFT "Navy After Next" focus with a practical, capabilities-based transformation roadmap for the Department of the Navy (DoN) Battle Force
- **Intent**
  - Design a DoN Battle Force, operating *distributed* and *scalable* **Integrated Naval Battle Networks**, capable in all access conditions, and effective against all potential challengers, at an affordable cost

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Scope

- As will be discussed in this report, the idea of integrated and scalable Distributed Naval Battle Networks implies that the future DoN "Total Force Battle Network" will include far more than just ships. These Battle Networks will be a heterogeneous combination of:
  - Crewed ship platforms such as aircraft carriers, surface combatants, and submarines;
  - Crewed ship platforms such as amphibious assault and maritime prepositioning ships;
  - Crewed logistics and fleet support ships;
  - Crewed aviation platforms, ranging from strike fighters like the F/A-18E and the Joint Strike Fighter, to air battle management aircraft, like the E-2C;
  - A wide variety and large numbers of unmanned systems, ranging from unmanned aerial vehicles (UAVs), unmanned aerial combat vehicles (UCAVS), unmanned surface vehicles (USVs), and unmanned underwater vehicles (UUVs);
  - Ubiquitous off-board and robotic sensors and distributed sensor networks;
  - A variety of Marine Air-Ground Task Forces (MAGTFs) and combat units;
  - A variety of Naval Special Warfare (NSW) units; and
  - The officers, Sailors, Marines and Joint personnel that man and operate them

- ***This study focuses on the crewed ship platforms that carry DoN and Joint personnel into harm's way, and from which DoN and Joint personnel operate and employ the Total Force Battle Network's full range of ships, units, sensors, weapons, aviation platforms, and unmanned systems***
  - As a result, the study will examine DoN aviation platform and unmanned system requirements, and the makeup and organization of US Marine and Naval Special Warfare Units, only insofar as they impact on overall (ship) platform architecture design and operations

Introduction

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A Competitive Strategy of Enduring Maritime Supremacy

- In 1890, the DoN—backed by the nation's leadership—changed its strategy for the global naval competition. Up until that time, the Department was content to participate in the competition, but not to win it. After 1890, however, the DoN's new strategy—sometimes explicitly stated, sometimes not—was to become the world's number one naval power, and to achieve global maritime supremacy

- In the past, one common measure used to indicate how well the US was doing in the "race" was to count the number of ships in the DoN's ***Total Ship Battle Force,*** or TSBF. However, because of changes in competition conditions, this measure may no longer be the most valid indicator of the true state of the global maritime competition

- A US naval racing (competition) strategy of achieving ***enduring maritime supremacy*** requires a much more nuanced *net assessment* about the state of the naval competition. As part of this net assessment, naval strategists and planners must:
  - Understand what the nation expects its Naval Battle Force to do;
  - Identify the full range of current or expected competitors;
  - Assess whether or not the *current* mix of platforms in the DoN Battle Force (the number and ratio of platform types)–and the collective capabilities that they represent—allow naval planners to confidently predict that the Battle Force will be able to prevail against all potential *current and near-term* competitors; and
  - Assess whether or not the *planned* mix of platforms in the DoN Battle Force allow naval planners to confidently predict the future Force will be able to prevail against all potential competitors over the *mid- to long-term*

History Suggests This Will be Neither a Straightforward Nor Easy Task: In Order to Maintain Enduring Naval Supremacy, US Naval Strategists Must Plan to Achieve Four Maritime Race Goals and to Prevail Against a Range of Future Challengers, Under Variable Racing Conditions

Potential Race Challengers

Traditional **Irregular** **Catastrophic** **Disruptive**

Race Goals

- **Reassure**
- **Dissuade**
- **Deter**
- **Defeat**

Overall maritime race goals must support the broader national security goals established by the nation's leadership. Today, these goals are to: reassure allies; dissuade would-be competitors from entering into a competition with the US; deter competitors now in the race from mounting a direct challenge against the US; and to defeat those that do

These four goals apply to a wide range of potential competitors. Identifying the most dangerous competitors, prioritizing preparations for each of them, and then adjusting the Battle Force's course and speed to deal with them, in turn, is a challenging strategic and planning problem under the best of circumstances

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Report Outline

- **Sight Reduction ("noon shot")**
  - Determining our current position in the global naval competition ("race")
- **Ship's Log**
  - Reviewing past performance on previous and current race legs
- **Forecast of Competition/Racing Conditions**
  - Running Before the Storm: Trimming sails for The Global War on Terrorism—the "Long War"
  - Predicting possible future race competitors and forecasting future competition conditions
  - Forecasting the future budget climate
- **Changing Battle Force Design Attributes and Selecting Battle Force Racing Style**
  - Modifying Battle Force design criteria for the current leg of the naval competition
  - Selecting basic Battle Force racing tactics
- **Adjusting course and speed**
  - Building an affordable ***"Total Force Battle Network"*** for the ***Joint Expeditionary Era***

Destination: a "500+ Ship" Naval Platform Architecture for the *National Total Force Battle Network*

- **12** (10?) SSBNs
- **60** nuclear-powered submarines, including:
  - 53 SSNs (dropping slightly over the next 12 years)
  - 6 (8?) SSGNs
  - 1 Special Mission Submarine
- **15** aviation power projection platforms, including:
  - 10 J-CVNs
  - 4 J-CVEs
  - 1 J-AFSB
- **84** (86?) AEGIS/VLS surface combatants, including:
  - 22 CG-52s
  - 34 (36?) DDG-79s
  - 28 DDG-51s
- **84** LCSs
- **91+** USCG Deepwater Cutters

"If you don't know where you're going, you won't know when you get there."
- Yogi Berra

- **54** "Sea as Base" maneuver platforms, including:
  - 8 LHD-1s
  - 24 LPD-17s
  - 16 MPFs
  - 4 T-LSVs
  - 2 upgraded T-AVBs
- **68** NFAF ships, including:
  - 8 T-AOE/T-AOE(X)s
  - 11 T-AKEs
  - 17 T-AOs
  - 8 (?) T-LKAs
  - 4 JCCXs
  - 5 Fleet Support Tenders
  - 4 Salvage Ships
  - 5 Fleet Tugs
  - 4 Ocean Surveillance Ships
  - 2 AHs
- **35+** Prepositioning and surge sealift ships

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Sight Reduction:

Determining Our Position in the Global Naval Race

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Losing the Lead?

- *"I think 360 is the magic number. At 300 ships, you turn into a pumpkin, and we're (still) going down.*
  - Representative Randy "Duke" Cunningham (R,CA)
- ***"****The battle force—the navy's fleet of front-line aircraft carriers, cruisers, destroyers, amphibious ships and selected support vessels—now numbers 296 ships…the smallest size since before World War I."*
  - San Diego Union Tribune, October 2003
- ***"****At least during the Clinton years the US was shrinking a fleet that really was oversized for the post-communist world. But having right-sized the fleet, budget planners are now inventing new excuses to continue the Navy's contraction."*
  - Loren Thompson, Lexington Institute
- *"We've cut too deep. We need more ships."*
  - Representative Duncan Hunter (R, CA); Chairman, House Armed Services Committee

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Maybe Not

- Implicit in the foregoing declarations is an important assumption: that the number of ships in the DoN's Total Ship Battle Force is the most important measure of US Battle Force capabilities

- At some point, of course, numbers of ships in the TSBF become very important, since a lack of overall numbers, or a deficiency in specific types of ships/platforms, will constrain Battle Force options and flexibility in developing plans and responding to contingencies

- However, focusing solely on the number of ships in the TSBF can be misleading:
  - Counting the number of ships in the TSBF is an arcane science; counting rules change over time
    - Only 17 of 26 mine warfare vessels "count" toward the current TSBF number
    - The DoN controls 95% of the world's militarily useful sealift, which underwrites its global power projection capability; these ships are not counted in the TSBF
    - The DoN has the largest Marine Corps in the world, by far; this important naval capability is not captured in a simple focus on ship numbers

- And under any circumstance, ***comparing contemporary US TSBF numbers with past US TSBF numbers is highly problematic.*** Such comparisons fail to account for:
  - The Navy's role in contemporary National Security policy and strategy;
  - The impact that new technology and weapons have had on comparative ship capabilities; and
  - The Battle Force's ***relative*** capability vis-à-vis its likely naval competitors

- With regard to the last point, a "sight reduction"—taking a series of navigational sightings from known points—helps to put the relative position of our "dwindling" TSBF among world naval competitors into better perspective

Navigator's Almanac

- But first, we need a Navigator's Almanac to help convert observed navigational sightings into a relative position

- ***Aggregate warship tonnage*** is used as a proxy for the overall fighting capabilities of world navies. The following types of warships are included in the figures:
  - Aviation power projection platforms (ships that can support fixed wing and/or vertical take-off and landing (VTOL) or short take-off and vertical landing (STOVL) aircraft
  - Surface combatants with a full load displacement (FLD) greater than 2,000 tons (capable of overseas deployment)
  - Submarines with submerged displacements greater than 450 tons (a German Type 205 coastal defense submarine equivalent)

- With a nod to the Royal Navy, ***a modern "rating system"*** is used to compare surface combatants
  - Such a rating system is required because traditional ship designations such as "cruiser," "destroyer," "frigate," and "corvette" are no longer helpful in distinguishing relative warship capabilities in different navies

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Basis for a Modern Rating System

- The contemporary combatant design era—spurred by the post-World War II transition to jets, missiles, nuclear attack submarines, more powerful multi-dimensional sensors, and guided weapons—is characterized by closely coupled, missile-equipped surface combatants (closely coupled means that a ship's major combat systems are integrated closely into the hull design)

- Just as the HMS *Dreadnought* sparked a move toward all-big gun battleships in the era of the armored battle line, the US introduction of the vertical launch system (VLS) for naval missiles in the mid-1980s spurred a move toward all-VLS armed surface combatants. Global vertical launch systems include:
  - The US Mk41 VLS, capable of handling/firing long-range, area air defense surface-to-air missiles (SAMs), local air defense SAMs, anti-submarine rockets, and land attack missiles;
  - The European Sylver VLS, capable of handling/firing either area or local air defense SAMs (this system will also be able to fire land attack missiles); and
  - Various point defense vertical launch systems, including VLS cells, below-deck rotary launchers, and above deck canisters, all capable of firing rapid reaction, short-range, terminal defense SAMs

- Single-purpose, rotary cylinder vertical launchers for long-range SAMs are a clear second choice among world navies (only the Russian and Chinese navies have pursued them)

- Therefore, a contemporary combatant rating system for closely coupled, missile-equipped surface warships is based first on the number of vertical launch cells a combatant carries, and second on the types of missiles they fire (which allows a comparison between them and with legacy non-VLS equipped ships)

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21st Century Combatant Rating System

- ***First-rate Battle Force ships (battleships)***: >100 VLS and/or "battle force missiles" (area air defense SAMs, intermediate/long-range anti-submarine rockets/missiles, over-the-horizon (OTH) anti-ship cruise missiles (ASCMs), or OTH land attack missiles
- ***Second-rate battleships***: 80-100 VLS and/or battle force missiles
- ***Third-rate battleships***: 60-80 VLS and/or battle force missiles
- ***Fourth-rate battleships/frigates***: 24-56 VLS and/or 30+ battle force missiles
- ***Fifth-rate frigates***: 8-24 VLS, and/or <30 battle force missiles, and/or >30 local air defense SAMs (e.g., SAMs suitable for the protection of convoys)
- ***Sixth-rate frigates***: 8-24 VLS, and/or <16 battle force missiles, and/or <30 local air defense SAMs
- ***Seventh-rate frigates***: 5-16 battle force missiles and terminal defense SAMs only
- ***Littoral combat corvette:*** <4 battle force missiles and terminal defense SAMs only
- For SAMs, the following range break points are used:
  - Range for an area air defense SAM: >48 km (approximately 30 miles)
  - Range for a local air defense SAM: 16-48 km (10-30 miles)
  - Range for a point defense SAM: <16 km (<10 miles)

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First Sighting:
Aggregate Fleet Tonnage

- The current fleet of US fighting warships—including aviation power projection platforms, surface combatants greater than 2,000 tons FLD, and submarines with submerged displacements greater than 450 tons—represent a combined mass of 2.86 million tons

- All of the rest of the world (ROW) navies amass a combined 3.04 million tons

- Other than the US, only 17 countries have navies that operate war fleets greater than 50,000 aggregate tons. Together, these 17 navies amass 2.70 million tons
  - Fourteen of these navies are from allied or friendly nations; one we count as a "strategic partner" (India). Of the remaining two potential naval competitors:
    - Russia's navy, assuming all ships are 100% operationally capable, can amass 630,628 tons
    - China's warship fleet totals 263,064 tons

(Note: the figures used herein come from two primary unclassified sources: data for foreign navies was drawn from the 2004-05 edition of *Jane's Fighting Ships*; figures for the US Navy reflect the TSBF listed in the US Naval Register on 31 December 2004)

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Second Sighting:
Aviation Power Projection Platforms

- Of the 15 aircraft carriers in the world capable of launching and landing conventional take-off aircraft (suitably modified for carrier service), the US has 12 (80%)
  - France, Russia, and Brazil have one each
  - Average US displacement : 97,605 tons FLD; average ROW displacement: 44,724 tons FLD
  - The only nations other than the US that are contemplating building these ships in the future are US allies/strategic partners: Britain, France, India

- The disparity in full load tonnage figures (an indication of the size of the platform) leads to a great disparity in the capabilities of US and foreign carrier air wings (CAWs)
  - A typical US CAW includes >70 aircraft, with airborne early warning and battle management aircraft like the E-2C, electronic attack aircraft like the EA-6B, a variety of "strike fighters" all equipped to employ guided weapons, a variety of helicopters, and special carrier onboard delivery (COD) aircraft
  - A typical ROW carrier air wing contains no more than 35-40 aircraft, usually a mixed load of fixed and rotary wing aircraft, with far fewer and less capable specialized support aircraft like the E-2C or EA-6B
  - The disparity in combat power between a US and ROW carrier air wing is far greater than that suggested by the differences in number of aircraft in the wing
    - In 1989, only a fraction of the aircraft in a US CAW could carry guided weapons; the CAW could strike a maximum of 162 separate targets a day (assuming a 200-mile range to target)
    - The strike fighters in a US CAW are now all configured to employ guided weapons; a contemporary CAW can strike a maximum of nearly 700 targets per day

Second Sighting:
Aviation Power Projection Platforms (2)

- In other words, a contemporary **one-carrier** *Carrier Strike Group* can strike more than twice the number of aim-points per day than could a 1989 **two-carrier** *Carrier Battle Force*
- It is unlikely the combined ROW carrier fleet could strike half the number of targets in a day that a *single* US carrier could strike

- Of the 19 VTOL/STOVL air-capable ships in the world, the US has 12 (63%)
  - The UK has three; India, Spain, Italy, and Thailand have one each
  - Average US FLD: 40,325 tons; average ROW FLD: 18,672 tons
  - The only nations besides US building these ships are US allies/strategic partners
  - These ships usually carry a mixed air wing of VTOL/STOVL aircraft and either ASW, mine warfare, or troop transport helicopters
  - The US ships can support an all-VTOL air wing of approximately 22-24 aircraft; ROW ships generally support an air wing of 6-12 VTOL aircraft
    - VTOL aircraft have far less operating range, endurance, and payload carrying capacity than the larger, catapult-launched fixed wing aircraft found on larger aircraft carriers

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Third Sighting:
Surface Combatants

- Of the 582 major surface combatants in the world, the US operates 100 (17%). However, these numbers obscure the commanding lead the US Battle Fleet enjoys in VLS-armed surface combatants

- The course of the all-VLS competition stands in stark contrast to the all-big gun battleship competition sparked by the introduction of the HMS *Dreadnought.* After the US introduced the first VLS-armed combatant in 1986, most naval competitors either declined or were unable to quickly copy or field similar systems
  - Now, 19 years after the commissioning of the first US VLS-equipped combatant, the US Navy has almost completed the total conversion of its surface "battle line" to VLS standard:
    - On 31 December 2005, of the 70 Battle Force combatants in the US TSBF, 68 were VLS-equipped. These 70 ships carried among them 6,827 VLS cells—all capable of storing/firing a large battle force missile
  - In contrast, by the end of December 2004, the ROW fleet had 30 VLS-equipped ships armed with 1,208 VLS cells capable of firing a larger battle force missile (many more ships carried smaller VLS cells capable of firing a local air or terminal defense SAM). *All* of these ships were in allied navies
    - Four Russian combatants carried an additional 36 rotary vertical launchers with eight launch cylinders each, capable of firing 288 long-range area air defense SAMs

- Moreover, the primary US VLS system, the Mk41, is a "modular" vertical launching system that can flexibly handle and fire area air defense SAMs, local/terminal defense SAMs, anti-submarine rockets, and land attack missiles. In contrast, most contemporary non-US VLS systems and rotary vertical launchers fire only SAMs

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Third Sighting: Surface Combatants (2)

- The VLS surface combatant competition, long dominated by the US, is now starting to intensify as world navies have finally made the move toward VLS-armed combatants

- The US dominates in the first-, second-, and third-rate battle force ship categories:
  - Of the world's 23 first-rate battle force ships, US has 22 (CG-52s) and Russia has one (*Kirov)*
    - Japan is building two (Improved *Kongous*); South Korea is building three (KDX-IIIs)
  - Of the world's 49 second-rate battle force ships, the US has 45 (2 CG-47s; 28 DDG-51s; 15 DDG-79s) and Japan has four (*Kongous*)
    - With the decommissioning of the two US CG-47s and the completion of the DDG-79 production run, the US will operate 62 of the world's 66 second-rates
  - Of the world's seven third-rates, the US operates three (3 DD-963s), and Russia operates four (3 *Slavas* and 1 *Kara)*

- Third-rate battle force ships appear to be a dying breed. They are gradually being supplanted by a new generation of fourth-rate battle force ship/frigates, armed with VLS and carrying a mixed area and local air defense SAM load. Examples include:
  - The Spanish F-100, carrying 48 Mk41 VLS cells and 104 total missiles (32 SM-2 area air defense SAMs; 64 Evolved Sea Sparrow Missile (ESSM) local/point defense SAMs; and 8 Harpoon anti-ship cruise missiles from above-deck canisters). FLD: 5,853 tons
  - The German *Sachsen*, carrying 32 Mk41 VLS cells and 64 total missiles (24 SM-2; 32 ESSM; 8 Harpoon from canisters); 5,600 tons FLD
  - The British Type 45 with 48 Sylver VLS cells and 56 missiles (48 Aster 30 area defense SAMs; 8 Harpoons from canisters); 7,350 tons FLD

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Third Sighting:
Surface Combatants (3)

- The legacy fifth-rate frigate, as typified by a warship with an above-deck Mk13 single-rail missile launcher serviced by a below-deck 40-round rotary missile magazine, is gradually being replaced by a new generation of VLS-equipped fifth-rate frigates. Examples include:
  - The Norwegian *Nansen*, carrying 8 Mk41 VLS cells and 40 total missiles (32 ESSMs fired from VLS; 8 canister-launched NSSM anti-ship cruise missiles; 5,290 tons FLD
  - The Singaporean *Formidable*, carrying 32 Sylver VLS cells and 40 total missiles (32 Aster 15 local/point defense SAMs, 8 canister-launched Harpoon); 3,200 tons FLD

- New sixth-rate frigates typically have 8-16 ASCMs and 16 vertically-launched terminal defense missiles (e.g., NATO Sea Sparrow, Israeli Barak, British Seawolf, European Aster 15, South African Umkhanto; Russian SA-N-9 Gauntlet). Examples include:
  - Saudi *Al Riyadh*, carrying 16 VLS cells and 24 total missiles (8 Exocet ASCMs fired from canisters and 16 VLS Aster 15s), 4,650 tons FLD
  - South African *Valour,* carrying 16 VLS cells and 24 total missiles (8 Exocet canisters and 16 VLS Umkhanto); 3,590 tons FLD

- Seventh-rate frigates are typically legacy (pre-VLS) surface combatants that focus either on anti-submarine warfare (ASW) or anti-surface warfare (ASuW). Examples include:
  - The US *Oliver H. Perry* FFG. The Navy is de-rating its fleet of 30 legacy (pre-VLS) *Perry*-class fifth-rate frigates into seventh-rate FF7 ASW frigates (primary weapon: ASW helicopters); FLD: approximately 4,000 tons
  - The Royal Navy Type 23, carrying 8 Harpoon ASCMs,16 Seawolf point defense missiles in above-deck trainable launchers, and ASW helicopters; FLD: 4,900 tons

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Fourth Sighting: Submarines

- Of the 376 “tactical” submarines (SSNs, SSGNs, SSs, SSGs, SSKs) in the world, the US operates 53 SSNs and 4 (converting) SSGNs, for a total of 57 (15%)
  - The average US boat has a submerged displacement of 7,238 tons; the average ROW boat displacement is 2,755 tons
    - This displacement disparity is somewhat misleading since it compares an all-nuclear US submarine fleet with a mixed nuclear/conventional ROW sub fleet

- Of the world’s 376 total boats, 101 are nuclear-powered (27%)
  - All 57 US boats are nuclear-powered; US allies operate an additional 17. Russia and China operate a combined total of 27 nuclear boats
  - Average US submerged displacement: 7,238 tons; average ROW displacement is 8,068 tons

- Of the 275 conventionally-powered ROW boats, 69 (25%) are operated by potential US naval competitors (Iran, Russia, China)

- The US does not enjoy even a two-Navy standard in “tactical” submarines (e.g., 57 US boats versus 93 Russian-Chinese boats)
  - However, since World War II, US TSBF designers have emphasized quality over quantity in the US submarine force, and have willingly accepted a disparity in submarine force ratios due to: their confidence in the superior capabilities of their submarines; the superior US ocean surveillance network; the high quality of US submarine force personnel and training; and presumed assistance from allied sub fleets

Fourth Sighting: Submarines (2)

- As a result, since World War II, the US submarine force has been routinely outnumbered in hull-counting competitions
  - For example, at the end of the Cold War, the ratio of US tactical subs to Soviet tactical subs (a *one-Navy* standard) was 1:2.78
    - In other words, the US confidently confronted a potential submarine adversary who operated nearly three times the total number of boats
      - Although it must be said that toward the end of the Cold War the level of confidence was dropping as the Soviets started to achieve "acoustical parity" with US boats

- The comparable contemporary force ratio assuming *a two-Navy standard* (a combined Russian/Chinese submarine fleet) is 1:1.63
  - By concentrating its force against either the Russian or Chinese submarine fleet, the US submarine fleet would enjoy a ratio close to, or better than, 1:1

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Fifth Sighting:
US Battle Fleet Combat Power

- The early US shift to VLS-armed combatants land its aggressive exploitation of the Guided Weapons Warfare Revolution (to be discussed later in the report) has allowed the US TSBF to maintain or increase its maximum fleet striking power even as its numbers have shrunk over the past 15 years

- Aircraft carriers:
  - In 1989, the maximum theoretical daily strike capacity for the US fleet of 15 (deployable) carriers was 2,430 aim-points
  - The comparative figure for today's fleet of 11 (deployable) carriers is approximately 7,700 aim-points

- Surface combatants:
  - The 1989 surface "battle line" (104 combatants) carried 1,525 VLS cells and 7,133 battle force missiles
  - The current surface "battle line" (70 combatants) carries 6,827 VLS cells and 7,443 battle force missiles

- Submarines:
  - The 89 SSNs in the front-line 1989 fleet carried 132 VLS cells and 2,317 total 21-inch weapons (in force optimized for ASW and ASuW operations)
  - The current fleet of 53 SSNs and 4 converting SSGNs carry among them 1,000 VLS cells and an additional 1,377 21-inch weapons launched from torpedo tubes, for a total war load of 2,377 weapons (in a force optimized for ASW and land attack (strike) operations)

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Sixth Sighting:
Force Sizing Planning Exercises

- The US Navy has long considered hypothetical war fighting scenarios for force planning
  - Perhaps the most famous of these were the "color plans "developed during the first several decades of the 20th century
  - For example, War Plan Black considered operations against the German fleet (in the Caribbean); War Plan Orange considered possible operations against the Imperial Japanese Navy; there were even color plans for possible operations against the Royal Navy

- Due to the disparity in capabilities between the US and other navies, contemporary planning scenarios involve anti-US naval coalitions or simultaneous confrontations between two or more naval adversaries. For example, the most stressful hypothetical hostile naval coalition would include the Russian, Indian, and Chinese navies, which would present the US Navy with a simultaneous three-ocean naval challenge
  - However, by embracing India as a strategic naval partner rather than considering it a potential naval adversary — just as Sir Jackie Fisher and the Royal Navy did with the US (and later the French) at the turn of the 20th century—the worst case planning scenario is reduced to a combined Russian-Chinese naval coalition

- This worst case, (but not very likely) hypothetical "two-Navy" scenario—a hostile Russian-Chinese naval coalition—would confront the US Battle Force with a fleet amassing a combined total of 893,692 tons, including:
  - One *Kuznetzov*-class carrier with a notional air wing consisting of 22 fixed wing aircraft and 17 helicopters;
  - 27 nuclear submarines (23 Russian and 4 Chinese), and 66 conventional submarines (53 Chinese, 13 Russian), for a combined submarine force of 93 boats; and

Sixth Sighting:
Force Sizing Planning Exercises(2)

  - 65 surface combatants, consisting of one first-rate, four third-rates, ten fifth-rates, and 50 seventh-rate warships

- Against this force, the current US fleet could operate 180 warships amassing a total of 2.86 million tons, including:
  - 11 deployable CV/CVNs, each with air wings consisting of 70+ aircraft;
  - 12 additional large air power projection ships capable of operating VTOL/STOVL and rotary wing aircraft;
  - 53 SSNs and 4 (converting) SSGNs; and
  - 100 surface combatants, consisting of a 70-ship battle line (22 first-rates, 45 second-rates, 3 third rates), and 30 seventh-rate frigates in a supporting role

- In terms of potential combat power, the US fleet would enjoy a decided advantage. The Russian-Chinese fleet has no appreciable aviation capability. As far as the surface fleet, the US battle line of 70 surface combatants carries among them 6,827 VLS cells and 7,443 battle force missiles
  - The combined Chinese-Russian fleet (including all frigates) carries 1,032 battle force missiles in single-purpose launchers
    - 576 ASCMs
    - 328 area air defense SAMs
    - 128 intermediate/long range ASW missiles
    - These battle force missiles are augmented by an additional 384 local air defense SAMs
  - As indicated by its aggregate magazine load, this surface war fleet is optimized for ASuW, and is vulnerable to asymmetric stand-off air and missile attack from US aircraft and submarines

Sixth Sighting:
Force Sizing Planning Exercises(3)

- Moreover, the US TSBF is still ***expanding*** its combat power
  - By 2010, a US CAW will be able to strike a maximum of **1,080 aim-points in a single day**
  - By 2010, the aggregate missile magazine capacity of the building/authorized surface battle line of 84 all-AEGIS/VLS warships will be **8,468 VLS cells** and 8,868 battle force missiles
  - The aggregate missile capacity of the planned submarine fleet will rise to **1,228 VLS cells** and 1,415 additional torpedo tube-launched weapons as the remaining 19 non-VLS equipped *Los Angeles*-class SSNs in commission today are replaced by new VLS-equipped *Virginia*-class SSNs now entering the fleet

- Meanwhile, the hypothetical combined Russian/Chinese Battle force is holding steady, at best
  - Neither the Russians nor Chinese navies appear to be pursuing further aviation power projection platforms
    - It seems likely that the single Russian aircraft carrier will not be replaced
  - The Russian surface fleet is dying:
    - The Russian *Sovremenny* fifth-rate frigates have a serious class-wide boiler problem; only five of the 17 built remain operational. The two ships still building are destined for China
    - Nine of 12 *Udaloy I* seventh-rate frigates remain in service; the *Udaloy II* class production run stopped after a single ship was built
    - No Russian ships larger than frigate size are currently being built

Sixth Sighting:
Force Sizing Planning Exercises(4)

  - The Chinese Navy appears to be in the midst of a general naval expansion, but its surface combatant fleet is not yet a credible threat
    - Its first VLS-equipped vessel with a powerful phased array radar is expected in 2005—a fourth- (or possibly third-rate) battle force ship/frigate with six (possibly eight), Soviet-designed, 8-round rotary vertical launchers
    - The remainder of its surface fleet is optimized for anti-surface warfare; its primary air defense missile system, the HQ-7 (based on the French Crotale), is a point defense system with a maximum range of only 13 km

- A combined Russian/Chinese submarine fleet would present the most worrisome maritime threat over the near to mid-term
  - A notional mid-term Russian/Chinese "front-line" force might consist of 27 nuclear boats (23 Russian SSNs and SSGNs, 4 Chinese Type 093 SSNs), 35 quiet diesels (13 Russian, 12 Chinese *Kilos,* 10 Chinese *Songs*), and 15 super-quiet diesels (15 Chinese *Yuans or* Russian *Petersburg/Ladas)*, for a total of 77 boats
  - In an offensive ASW scenario, assuming the US fleet holds steady at approximately 53 SSNs (SSGNs would not count in an offensive ASW confrontation), the comparative mid-term force ratio would thus be 1 US SSN for every 1.45 Russian/Chinese boat
    - This ratio does not include the potential support from European/Pacific allied submarine fleets, which might contribute submarines in a naval confrontation
    - And, of course, the ratio would only improve if the US submarine fleet concentrated its SSN force against one of the two opposing fleets

Sight Reduction: Converting Observed Sightings Into a Known Position in the Global Maritime Competition

- **Despite its relatively small size—*in comparison to some past US Battle Fleets*—the current US TSBF represents the world's greatest concentration of naval power by a commanding margin. It currently faces only regional naval challengers—and relatively weak ones at that**

- The US TSBF enjoys at least a 17-Navy standard—and nearly a world standard—in aggregate warship tonnage

- Of the world's 34 aviation power projection platforms, the US operates 24 (71%)—eight times more than the second leading navy (the UK, with three CVVs)
  - Moreover, all the rest are operated by US allies/strategic partners

- The US surface battle line enjoys a dominant lead in the VLS combatant regime: it carries 6,827 VLS cells capable of firing large battle force missiles while the ROW fleet has 1,208 VLS cells capable of firing battle force missiles, and an additional 36 rotary vertical launchers capable of firing an additional 288 missiles

- The US submarine force today enjoys better force ratios using a two-navy standard than it did in the Cold War using a one-navy standard

- Finally, the US out-masses its two biggest potential naval competitors by over 3:1, and enjoys an overwhelming relative overmatch in potential Battle Force combat power

In Other Words: the Current US Total Ship Battle Force is the Most Powerful DoN Battle Force Ever Put to Sea, and it Enjoys a Dominating Margin of Naval Supremacy

Counting ships in the TSBF no longer gives the most accurate picture of the state of the global maritime competition

"*The 600-ship Navy of the 1980s cannot compare with the combat capabilities of the present Fleet."*

– Vice Admiral Dennis McGinn, February, 2001

"*No one is going to challenge us at sea for the next 20 years."*

- Norman Polmar, editor, *Ships and Aircraft of the US Fleet*

"…the US Navy remains by a vast gap the world's most powerful, and…has been steadily increasing its margin of power over any possible protagonist—or even groups of protagonists…(T)he Navy's fleet is essentially unchallengeable, and its aircraft inventory is far larger than that of any foreign nation's air forces, land- or sea-based. From the standpoint of military technology, there is simply no other nation with the same naval capabilities, and it appears that no challenger will be likely to appear for two to three decades in the future."

– A. D. Baker III, editor, *Combat Fleets of the World*

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Been There, Done That

- Since the age of gun and sail, the only comparable margin of maritime supremacy to that now enjoyed by the DoN TSBF was at the end of World War II, when the DoN Battle Force also commanded a similar lead in the global maritime competition

- Indeed, some might argue that because of its overwhelming superiority, the DoN Battle Force could shrink dramatically without any appreciable increase in risk, as some did in 1946/47:

  "Why should we have a Navy at all? The Russians have little or no Navy, and the Japanese Navy has been sunk, the navies of the rest of the world are negligible, the Germans never did have much of a Navy. ***The point I am getting at is, who is this big Navy being planned to fight?*** *There are no enemies for it to fight except apparently the Army Air Force. In this day and age to talk about fighting the next war on the oceans is a ridiculous assumption.* ***The only reason for us to have a Navy is just because someone else has a Navy and we certainly do not need to waste money on that"*** *(*emphasis added).

  High ranking Army Air Corps Officer circa 1946-47

As History Proved, However, Preserving Naval Supremacy Over the Course of a Long Naval Competition is a Challenging Task, and Any Reductions in Battle Force Capabilities Must be Carefully Considered

- Indeed, while the just completed analysis might suggest the US has an insurmountable naval lead, some would rightly argue that the metrics selected for comparison are misleading

- For example, in the naval age of sail and gun, when naval battles were generally fought symmetrically, aggregate tonnage—tied as it was to the number and size of ships in a fleet and their total *gun-carrying capacity*—was a good comparative measure of Battle Force capabilities
  - Today, in an era of asymmetric attacks on surface ships from aircraft, missiles, and submarines, a 100,000-ton Navy consisting of fifty, 2,000-ton diesel submarines with air independent propulsion (AIP) would give even a 2.86 million-ton Navy pause

- Similarly, in the naval age of sail and gun, a rating system was a good measure of comparative surface combatant *tactical* capabilities, and a good predictor of the outcome of *ship-on-ship* combat, since the likelihood of a fifth-rate taking on a first-rate and winning was minimal
  - In the missile age, however, even a modern day seventh-rate frigate, or even a "sloop" or "brig," can take out a first-rate if it can get within missile range

- Even more fundamentally, these metrics were developed for an era when the naval competition was among ocean-going, sea control navies, and when battles between opposing fleets were common. They are not as useful in the emerging competitive environment which pits a US transoceanic power projection fleet against regional sea denial navies which have exported most of their battle lines ashore

When Developing a New Racing Strategy, However, DoN Planners Should Keep in Mind the Commanding Lead They Now Enjoy

- The current Battle Force, built with such foresight and care over time, represents one of the—if not the—most powerful naval force in naval history. It can undoubtedly outmatch any potential near-term competitor, or group of competitors
  - The sheer margin of US naval superiority suggests that changes to the US maritime competition strategy need not be rushed; planners should resist calls for immediate, radical changes in Battle Force course and speed
  - Changes to the strategy should also account for the fact that the US is the leader of a global maritime coalition of like-minded nations; dramatic changes that further widen the gap between the US and allied naval capabilities may be more counter-productive than productive
  - Planners should thus plan and expect to make carefully considered and measured variations off the Battle Force's current base course with the *long-term* maritime competition in mind

- Indeed, it is the change in the long-term competitive environment that most animates the current calls for change from the DoN's leadership. As Admiral Clark, the current Chief of Naval Operations (CNO), recently stated:

  "Our Navy is not correctly optimized and balanced **for the challenges of the future**. *The strategic landscape is changing in front of our eyes… challenging our thinking about irregular and catastrophic threats"* (emphasis added).

  He went on to say that the Navy needed to *"challenge every assumption"* in preparing for the future, since it *"can't get better by staying the way it is."*

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In Other Words:

It is time to review and change our maritime racing (competition) strategy and to re-balance the Total Ship Battle Force—to better prepare the DoN Battle Force for future challenges and challengers, and in order to maintain enduring maritime supremacy:

“While we need to retain the ability to deal with traditional conflict, we need to reshape our force structure to meet the challenges of the 21st century."

Admiral Vern Clark
Chief of Naval Operations

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Ship's Log:

Reviewing Past Performance On Previous and the Current Race Legs

Before Considering Changes to Our Competition Strategy or to Battle Force Course and Speed, it Might Be Prudent to Review the Ship's Log for Insights on Prior Changes to DoN Racing Strategy

- The DoN achieved its current commanding margin of maritime supremacy over the course of a 222-year race, run over three previous "legs," referred to by Samuel Huntington in a provocative 1954 *US Naval Institute Proceedings* article as "National Security Eras." The completed legs can be identified as:
  - The ***Continental Era***
  - The Oceanic, or ***Expeditionary Era***
  - The Transoceanic, or ***Garrison Era***

- The DoN changed its race strategy during each of these legs based on a net assessment of what the Battle Force was tasked/expected to do, the strengths and weaknesses of its perceived competitors, and the state of contemporary naval technology

- Informed by these assessments, it changed the course and speed of the Battle Force on each leg, reflected by the very different ***"naval fleet platform architectures"*** evident during each National Security Era. In the past, these architectures were defined principally by the "capital ship" of the era:

"*The capital ship forms the body of the Navy in the same way that the Infantry forms the body of the Army…[A]nd in the final analysis, the old maxim about the Infantry that I think was put forward by Napoleon and other numerous gentlemen in the past, holds true of the capital ship…'The Infantry is the Army—when the Infantry is defeated the Army is defeated!'…That, in my opinion, holds good for the capital ship in the navy."*

Assistant Secretary of the Navy T. R. Roosevelt
1922

Naval Battle Force Eras Thus Reflect the DoN Racing Strategy Adopted During a Given National Security Era

- Three broad Naval Battle Force Eras, aligned generally with the three aforementioned National Security Eras, can be identified by three unique naval fleet platform architectures based around the fleet's contemporary capital ship(s):
  - The ***Frigate Era***
  - The ***Battleship Era***
  - The ***Carrier and SSN Era***

- Reviewing the competition strategy, associated fleet platform architecture, and Battle Force operational performance on each of the past racing legs may provide clues on how best to describe the current leg of the race (the contemporary National Security Era). Such a review might also suggest what alterations to the current DoN competition strategy and associated naval fleet platform architecture might be warranted

- After all:

  "…*the best grand strategies, like the most efficient navigators, keep the winds behind them*."

  John Lewis Gaddis

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Ship's Log, Page One

- **Warming Up: The Revolutionary War, 1775-1783**
  - That the US should even enter the global naval competition was an idea hotly debated, even on the brink of war
    - On October 3, 1775, the Rhode Island delegation to the Continental Congress introduced a resolution that the Congress build and equip a fleet as soon as possible
    - In response, Samuel Chase of Maryland thundered: "It is the maddest idea in the world to think of building an American fleet;…we should mortgage the whole continent." The idea was tabled
  - Soon thereafter, Congress learned that two unarmed and unescorted brigs, loaded with war supplies, had left England bound for America. The Congress immediately asked that Massachusetts, Connecticut, and Rhode Island provide armed schooners to capture the brigs "on the continental risque (*sic*) and pay"
  - Building upon this Congressionally-sponsored, State-executed adventure, on 13 October 1775, Congress authorized the fitting out of two small armed vessels to intercept British transports approaching the east coast. The Continental Navy was born
    - Less than one month later (10 November 1775), the Continental Marine Corps was established. Marines would augment the crews of US warships at sea and serve as fleet landing forces
    - Although not called so at the time, the first DoN Battle Force—consisting of both the Navy and Marines—was born

Ship's Log, Page One (2)

- Unfortunately, the Continental Navy and Marine Corps had to immediately compete against the number one naval competitor in the world, the Royal Navy. With little more preparation that courage and pluck, the results were predictable:
  - All fleet/squadron actions fought by the Continental Navy along the North American coast led to US defeats
  - Out of necessity, the Battle Force thus turned its attention to *guerre de course*—literally, war of the chase—or privateering and commerce raiding

- The pre-Republic Battle Force emphasis on commerce raiding is best summed up by the following figures:
  - The total number of ships in the Continental Navy from 1775-1783 never exceeded 80 ships, of all classes
  - The total number of Congressionally authorized privateers was 1,647; these numbers do not include the privateers authorized by the individual states (Massachusetts and Rhode Island authorized 1,000 on their own)

- The intervention of the French naval battle line on the side of the Continental Navy broke British naval dominance along the eastern coast of the US twice:
  - Between September 1779-July 1780; and again
  - From August-October 1781, during the Battle of Yorktown—perhaps the decisive battle of the war

Marginal Notes,
Ship's Log, Page One

- The success of Continental privateers during the Revolutionary War highlighted a strategy that might allow the new Republic to compete in the global naval race at a reasonable cost and with no little payoff, even if it had little chance (or desire) to win the race

- The elements of this strategy, as described by Kenneth J. Hagan in his book, *The People's Navy: The Making of American Sea Power,* were based on "four emotions*:"*
  - A distrust of fleets;
  - A reluctance to challenge a strong opposing navy;
  - A fondness for attacking an enemy's merchant vessels and cargo ships; and
  - A desire to limit expenditures, always

- The Navy and Marine Corps were born within one month of each other, and bonded together in the heat of competition. Although the relationship between the two services might have been unequal, with Marines subordinate to the captains of fighting ships, the operational linkage between the two "sea services" was necessarily close
  - Marines fought alongside Sailors in all major ship actions
  - Sailors accompanied Marines on all landing parties

Ship's Log, Page Two

- **First leg: Continental Era, 1783-1889 (Ready, set, go)**
  - The era started with the disestablishment of the forces that fought and won the Revolutionary War: the Continental Army, the Continental Navy, and the Continental Marine Corps
    - The last remaining Revolutionary War warship—the 32-gun frigate *Alliance*—was sold in 1785
    - The intent was to save money and not to indulge in great power struggles overseas
  - However, from 1783 on, attacks by the Barbary pirates on US ships in the Mediterranean (believed by the US to be instigated by the British) were continuous. By 1794, the attacks had reached a level that prompted the Congress to once again consider the wisdom and cost of re-entering the global naval competition
    - Those against the idea believed that buying the pirates off would be cheaper in the long run than building a fleet, and that the "sending of armed ships into the midst of the fleets of Europe would certainly produce a quarrel."
    - Those for the idea pointed out that the cost of outfitting a fleet would be small in comparison to the ruinous insurance rates being paid by US traders
  - In March 1794, the President signed "An Act to provide a Naval Armament," which authorized the purchase of four 44-gun and two 36-gun frigates. With this Act, the US appeared set to officially enter the global naval race, for good
  - However, diplomatic successes put the construction of the frigates on hold until 1798, when the quasi-War with France convinced Congress it needed to maintain a Navy, despite the high associated costs

Ship's Log, Page Two (2)

- Between 1798 and 1800, Congress passed a series of bills expanding the navy to a force of more than thirty ships and, on 30 April 1798, passed an act that established an independent executive Department of the Navy, tasked with developing US maritime competition strategy and developing supporting naval platform architectures
- On July 11, 1798, the Marine Corps was also re-established

– The early maritime racing strategy developed by the DoN was directly influenced by primary focus of the armed services during the Continental Era: to forge, protect, and preserve the Union; repel attacks from outside the hemisphere; and screen the national expansion to the limits of the US continental borders
  - No major "out of area (hemisphere)" operations were conducted except for relatively small naval expeditionary missions
  - The dominant armed service of the era was the US Army

– What the DoN was generally tasked to do: ***protect US global trade and interests in peacetime; break blockades, conduct guerre de course (commerce raiding), and support US land forces during wartime***
  - These missions reflected a racing strategy that accepted relative US naval weakness in "away games," sought stronger relative performance in "home games," and "devot[ed] scarce resources to small ships that could protect US maritime trade in peacetime and raid enemy sea-based commerce in wartime."

Ship's Log, Page One (3)

- The capital ship of this era was the sailing frigate/steel cruiser, although the US did operate some ships of the line

– The need to protect US enduring peacetime trading interests led to the gradual development of naval "forward stations:"
  - Between 1815 and 1889, there were several stations, not all maintained simultaneously or continuously:
    – East India Station (Western Pacific)
    – Pacific Station (West Coast South America)
    – West India Station (Caribbean)
    – Brazil Station (East Coast South America/South Atlantic)
    – Africa Station (West Coast Africa)
    – North Atlantic Squadron/Station
    – Mediterranean Station

– Throughout the era, the US Battle Fleet was a relative lightweight among a large number of world naval powers, never rising above fourth place except during the Civil War (and then only in numbers; the Civil fleet included large numbers of river craft that were not capable of sustained operations at sea)
  - At the time of the War of 1812, the US Navy had 17 seaworthy ships with 447 guns and 5,000 officers and men; the Royal Navy had 1,048 ships, 27,800 guns and 151,500 men
  - In 1883, the year Congress authorized the ABCD steel ships, the US Navy ranked twelfth among world naval powers in the global naval race

Marginal Notes, Ship's Log, Page Two

- Although National Security Policy on this first leg of the naval race was continental in focus, and the size of the US Battle Force small in relation to the top three naval competitors, Navy and Marine operations were decidedly global in scope
  - The early quasi-war with France and expeditions to quell the Barbary pirates set the tone for the nation's Naval Service for the remainder of the era
  - The DoN preferred deployment pattern was ***distributed squadron operations*** and ***distributed, independent ship operations***, so as to provide the greatest global coverage with a relatively small number of ships
  - During peacetime, these forward deployed squadrons and ships, and the Sailors and Marines on them, conducted many small ***distributed expeditionary operations*** in support of US interests
    - Operating independently overseas, commanders trained their crews to flexibly respond and adapt to circumstances, and for decisive and aggressive action
  - The DoN's day-to-day emphasis on rapid situational assessment, flexibility, and adaptation helped to forge the expeditionary mindset ingrained in all Sailors and Marines to this day

- Navy and Marine operational linkages were close and strong, especially after 1834, when Marine operations were closely aligned with those of the Battle Force
  - The primary tactical unit of action was an individual fighting ship
  - Marines were an integral part of a shipboard combined arms fighting team
  - Sailors and Marines fought side-by-side in both ship actions and on landing parties

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Marginal Notes, Ship's Log, Page Two (2)

- Because the capital ship of the US Battle Force was a frigate and not a ship of the line, and because DoN tactical doctrine required ships to operate "alone and unafraid," the first US frigates introduced a long-standing US preference for naval technological overmatch in ship classes
  - The first US sailing frigates represented true "transformational" warships: the firepower of these frigates gave their commanders the "power to engage, or not, any ship, as they may think proper; and no ship, under sixty-four guns, now afloat, but what must submit to them"
  - Our early ability to build technologically advanced ships was a proud reflection of our national technological prowess

Ship's Log, Page Three

- **Second leg: Expeditionary Era, 1890-1946 (Place, Show, Win)**
  - In 1890, The Battle of Wounded Knee—the last "battle" inside the continental United Sates—secured the continent; Alfred Thayer Mahan's writings gave the nation's leaders a reason to extend the national security perimeter:

    "We are a great people; we control this continent; we are dominant in this hemisphere: we have too great an inheritance to be trifled with…It is ours to guard and defend."

    Sen. Henry Cabot Lodge, 1895

    "Our national defense must extend all over the western hemisphere, must go out a thousand miles into the sea."

    Assistant Secretary of the Navy F.D. Roosevelt, 1915

  - The primary role of US armed forces gradually shifted toward mounting expeditionary operations overseas in support of US global interests
    - The dominant service during this era was the Navy

  - What the DoN was generally tasked to do: ***sea control***
    - *Guerre de course* gave way to *guerre d'escadre*, or fleet battle actions, in which a US armored battle line would confront an opposing fleet battle line

  - Mahan's vision of a sea control Navy structured around a concentrated armored battle line sparked a national naval shipbuilding and technology development program, centered on the battleship—the Battle Force capital ship which gave its name to the associated Battle Force Era

Ship's Log, Page Three (2)

- In 1890, there were a total of 42 ships in the TSBF. By 1901, 60 ships of all classes were under construction, and the $78 million appropriations bill passed in the fall was the largest in US peacetime history
- By 1910, the TSBF counted 196 ships, and the US battle line was among the top contenders for second place in the global naval race along with Japan and Germany , with the Royal Navy as the clear leader

– Early in the era, the US acquired and maintained an out-of-hemisphere overseas basing structure for the first time:
  - The structure focused on supporting operations in the Western Pacific
  - The was a clear US preference for forward basing on US sovereign or controlled territory; pre-emptive loss of forward bases was a constant concern that grew over time, especially after 1911

– During this era, stations gradually gave way to two major fleets concentrated in home waters—the Atlantic Fleet and the Pacific Fleet
  - These fleets could concentrate by using the Panama Canal
  - There was also a smaller Asiatic Squadron/Fleet in the Western Pacific
  - US naval forces also always operated in European waters—generally in ***distributed squadrons*** of small combatants, occasionally augmented by cruisers and battleships

– After World War I, the US Navy was tied with the Royal Navy for number one in terms of aggregate tonnage, by treaty
  - However, in practice, US funding limitations during the Great Depression meant it was virtually tied for the number two spot with the Japanese Imperial Navy
  - Between 1931 and 1937, the TSBF ranged between 304-335 ships

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Ship's Log, Page Three (3)

- While the Marine Corps performed many expeditionary operations as "State Department troops" up through the 1920s, and maintained a Regiment in China from 1929-1941, it gradually turned its institutional focus and attention toward seizing advanced naval bases *in support of forward sea control operations*

- After December 7, 1941, the Battle Force was forced to make an abrupt transition from the Battleship to the Carrier Era
  - Instead of a single concentrated battle line, the Navy would form ***distributed fast carrier task forces and surface action groups*** capable of rapid concentration
  - Every ship class in the TSBF except mine warfare ships played a different role in World War II than it was designed for
  - Two decades of Fleet Battle Experiments and practical analysis during the Interwar Period helped to ease the abrupt transition

- As long as the Imperial Japanese and German navies remained viable threats, the focus of Battle Fleet operations during World War II remained on sea control
  - However, by the latter part of World War II, after the Imperial Japanese and German Navies had been rendered ineffective, the focus of the fleet turned to *power projection*—projecting fleet and Joint combat power ashore in support of land campaigns
  - Reflecting this reality, during World War II, amphibious ships gradually supplanted surface warships as the TSBF's power projection "ships of the line"
  - By 1945, amphibious ships made up 37.6% of the TSBF; the ratio of amphibs to major surface combatants in the Battle Force reached 3:1

Ship's Log, Page Three (4)

- In March 1943, the US Navy dropped a "Fido"– a Mk 24 Acoustic Mine (Torpedo)—on a German submarine in the Atlantic Ocean
  - This proved to be a momentous event; it ushered in the Guided Weapons Warfare Regime for the US armed forces
  - The import of this new Guided Weapons Warfare Regime will be discussed throughout the remainder of the report

- By 1945, the US Battle Force achieved its naval competition goal, set in 1890:
  - With 6,768 ships of all types, It had surpassed the Royal Navy as the largest and most powerful largest naval power in the world in terms of tonnage, number of ships, manpower, and the size of its Marine Corps
  - It was, "incomparably, the finest navy in the world"
  - However, the DoN's very success created its most formidable challenge: there was no longer any credible potential hostile navy or naval coalition to fight
    - For the first time in over five decades; *guerre d'escadre* was no longer a viable Battle Force *raison d'etre*
    - As a result, the DoN struggled to identify and articulate its continued contributions to National Security policy

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Marginal Notes, Ship's Log, Page Three

- The beginning of the Expeditionary Era was marked by an intense debate over America's role in the world. As described by historian Walter MacDougal in his book *Promised Land, Crusader State,* the debate was waged between two passionate groups:
  - Those who subscribed to the "Old Testament" of US foreign policy; the four books of the Old Testament of foreign policy described the US global role as one of an example of state responsibility and freedom, and imperialism an evil to be avoided
  - Those who subscribed to the "New Testament" of US foreign policy; the four books of the New Testament described the US global role as one of a confident crusader for freedom in a dangerous world
  - This debate raged through and past the Philippines Insurrection, but was largely settle at the national level with the election of President Theodore Roosevelt

- The DoN's perceived requirement to project the Battle Force across the Pacific to destroy the Japanese fleet—without access to forward bases—helped drive three great Interwar naval transformations
  - If required to project power into the teeth of an "anti-access/area denial" (A2/AD) network anchored by land-based aircraft and supported by mobile naval forces, the Battle Force itself had to become a mobile ***sea base.*** This sea base had to:
    - Have mobile artillery platforms to engage the Japanese "battle line;"
    - Have mobile sea-based aviation power projection platforms;
    - Be able to carry, land, and support the ground forces necessary to attack and seize forward operating bases (FOBs), in order to roll back the Japanese A2/AD network and to support follow-on sea control operations; and
    - Be able to sustain itself while at sea and set up forward mobile logistics bases

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Marginal Notes, Ship's Log, Page Three (2)

- These particular requirements eventually led to a division of responsibilities in DoN sea base/power projection operations. The Navy would man the surface combatants and aviation power projection platforms that would escort and protect the amphibious task force; man the specialized ships designed to transport the landing force; and provide the landing force with fires and logistics and other support (e.g., medical). The Marines would focus on conducting amphibious assaults from the sea base
  - A relatively small number of Marines remained on capital ships and in "ships' platoons on the amphibious sea base; a relatively small number of Sailors continued to play specialized roles in the landing force (e.g., corpsmen; underwater demolition teams (UDT); Seabees). But, in general, Battle Force skills became increasingly specialized within the DoN
  - From the very beginning, one particular aspect of the division between navy and Marine responsibilities—Marine aviation—was to prove a sticking point between the Navy and Marines from the very beginning (to be discussed in more detail later in the report)

- The Army, like the Marines, generally went to the fight by ships (although it had 5 airborne divisions in World War II). Although both the Army and Marines conducted all manner of amphibious operations, they each perfected their own preferred style of amphibious forcible entry operations:
  - Marines focused on amphibious assault, attacking where the enemy was, covered by carrier air power
  - The Army focused on operational maneuver from the sea, attacking where the enemy was not, supported by land-based airpower
  - The US amphibious assault fleet could transport approximately 15 of the 91 non-airborne divisions (85 Army, 6 Marines) in the World War US force structure; the vast US Merchant Marine could lift substantially more

Ship's Log, Page Four

- **Third leg: Garrison Era: 1947-1988 (Protecting the Lead)**
  - 1947: With the Truman Doctrine and Marshall Plan, the US drew the line in Europe against further Communist expansion
  - The primary role of the US armed forces changed once more—to contain the expansion of the Soviet Empire and to deter the Soviet Union from resorting to forcible expansion
    - With the 1949 formation of NATO, the US began to assemble and man large standing garrisons overseas on allied soil for the first time
  - The first decade-and-a-half of the era saw all of the armed services struggle with the operational and tactical implications of nuclear and guided weapons warfare, and with successive Administration attempts to limit overall defense expenditures
    - For the DoN, which by 1945 had passed the Royal Navy in the naval competition and literally destroyed all other potential naval challengers, the transition period was especially tough
      - By 1950, the TSBF shrank from its World War II high of 6,768 ships to 634 ships
    - After 1953, the Eisenhower Administration's New Look defense program emphasized long-range airpower and atomic weapons and deemphasized ground and naval forces; the US Air Force became the dominant service
    - The pursuit of guided weapons in ASW, strategic air defenses, and air-to-air warfare spurred early moves toward service-centric analog battle networks
      - The World War II pursuit of tactical air-to-ground guided weapons was largely abandoned in the 1950s, with emphasis placed instead on fielding tactical nuclear weapons

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Ship's Log, Page Four (2)

- After 1961, the Kennedy Administration's emphasis on "flexible response" ended the nearly two century-old US practice of having a dominant peacetime service
  - The "1/3-1/3-1/3" Departmental budget split that evolved in Secretary of Defense Robert McNamara's Planning, Programming, and Budgeting System (PPBS), although not intended as such, evolved into a "*negotiated treaty to satisfy all…[DoD] constituents."*
    - Thereafter, major "reallocations" among services proved to be rare, and were generally used to pay for episodic high cost service systems or pressing national security requirements (e.g., National Missile Defense)

- What the DoN was generally tasked to do:
  - With no fleet to fight (initially) or forward bases to seize, both the Navy and Marines moved to establish and man their own special purpose "naval garrisons" along the Eurasian littoral
    - Keeping ***"combat credible" forces*** (numbered fleets) forward in two or three fleet "operating hubs" defined the DoN's operating pattern for the next 55 years
    - These moves were in keeping with the long DoN practice of maintaining distributed naval forces forward in peacetime
  - Critically, however, without the linking requirement to seize/defend advance naval bases, Carrier Battle Groups (CVBGs) began to focus on *independent strike operations*, while Amphibious Ready Groups/Marine Amphibious Units (ARG/MAUs) began to focus on independent *sea-based intervention operations*
    - The deployments of Carrier Battle Groups and ARG/MAUs were not synchronized
    - This sparked the start of a divergence in Navy and Marine Corps world views
  - From this forward-deployed posture, the both services excelled at *crisis response operations* at the lower end of the conflict spectrum

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Ship's Log, Page Four (3)

- With theater access reasonably assured during this era, the requirement to seize forward bases diminished over time
  - There were two short periods of resurgence for the amphibious assault fleet: during the Korean War, when it was needed; and between 1961 and 1964, when it was valued as part of the Kennedy Administration's emphasis on "flexible response"
    - The last opposed amphibious operation, Inchon, occurred in the very early part of the era
    - The Marines landed brigades in Lebanon in 1958, and in the Dominican Republic and Republic of Vietnam in 1965, but all of these landings were unopposed
    - The war in Vietnam saw no major amphibious assaults or operations

- Given the era's strategic reality of relatively assured forward access, after Vietnam, when the Navy was once again confronted by a serious challenger in the global naval competition—the resurgent Soviet Navy—the fleet's forcible entry capabilities (to include its mine warfare forces) rapidly declined
  - After 1972, the US Navy generally "outsourced" mine warfare to allied navies based forward (although it did introduce modern US systems in the late 80s)
  - By 1987, despite a stated DoN requirement to lift the assault echelons of a Marine Amphibious Force (MAF) and a separate Marine Amphibious Brigade (MAB), amphibious ships comprised only 9.7% of the TSBF, and the ratio of "amphibs" to surface combatants reached a post-World War low of .26:1
  - Both the mine warfare and amphibious communities in the Navy steadily lost their prestige and voice during this era

CSBA

Ship's Log, Page Four (4)

- With a new serious naval challenger to fend off, the DoN aggressively pursued and built a "600 ship" Navy based around aircraft carrier strike groups and nuclear-powered attack submarines
  - Aircraft carriers and SSNs were the new capital ships, and they gave their name to the associated Battle Force Era

- Over the course of the Garrison Era, given the ready access to forward bases, ***all*** US combat operations became increasingly "access dependent:"
  - The Navy's "Maritime Strategy" assumed forward bases (especially for P-3 ASW patrol planes and resupply of underway replenishment groups)
  - The Marines increasingly relied on "access-sensitive" initiatives to speed their force closure and reinforcement timelines
    - First came the Norway Air-Landed Marine Expeditionary Brigade (NALMEB), a brigade set of equipment housed in caves in Norway to facilitate rapid Marine reinforcement of the NATO northern flank
    - Then came the Maritime Prepositioning Force (MPF), three brigade sets of equipment in floating warehouses to facilitate rapid Marine reinforcement of first the Rapid Deployment Joint Task Force, and later global operations
  - The Army and Air Force operated from fixed forward bases in Europe and in the Pacific, and both relied on land prepositioning of unit sets and equipment to improve closure timelines for reinforcing forces

CSBA

Ship's Log, Page Four (5)

- Throughout the era, the Guided Weapons Warfare Regime gradually manifested itself
  - The two key characteristics of this regime were: w*eapons accuracy independent of range* and t*he rise of sensing networks to exploit extended range accuracy*

- In the early to mid-1970s, the full import of the Guided Weapons Warfare Regime began to more fully reveal itself as:
  - Digital microprocessors made the weapons more reliable, and sensors more sensitive and accurate
  - The US military considered the dramatic impact of tactical guided weapons in the 1973 Arab-Israeli War; and
  - The US military turned its attention away from Vietnam and toward tackling the knotty operational problem of stopping Soviet attacks in Europe without resorting to nuclear weapons

- In 1975, the US elevated the pursuit of "conventional weapons with near zero miss" to the level of national strategy
  - By the mid-1980s, Soviet military theorists concluded that a new military technical revolution had occurred, based around the appearance of air-land "reconnaissance strike complexes," or *guided weapon battle networks*

- By 1986, Congressional impatience with lack of cooperation in Joint warfare prompted the passage of the Goldwater-Nichols Act, which strengthened the authority of Joint commanders, and "legislated" operational trust and reliance among the services
  - This legislation set the stage for the development of even more powerful, seamlessly interconnected, Joint Multi-dimensional Battle Networks

CSBA

Marginal Notes, Ship's Log, Page Four

- During this era, Navy continued its steady transformation ***from a sea control to a strike Navy,*** focused on the delivery of ordnance on target
  - Up through 1964, Navy Admirals, all veterans of the Pacific campaign, continued to support a strong amphibious assault capability
    - In 1964, Exercise Steel Pike I saw the Navy land a division of Marines (22,000 Marines and 5,000 vehicles) across beaches in Spain, the largest such exercise since World War II
  - However, after Vietnam, as more and more World War II veterans retired, and as the memory of Inchon gradually faded from the Navy's institutional memory, and as the Navy became accustomed to assured access, Navy platform decisions began to focus more and more on strike, as opposed to balanced power projection, operations

- The Marine Corps helped to sharpen the Navy's focus on strike as it started to focus on its separate role as ***an expeditionary force-in-readiness,*** and become a much more independent and assertive armed service and DoN partner
  - The 1947 National Security Act emphasized that the Marine Corps was a separate service within the Department of the Navy
  - In response to pre-War efforts to disband the Corps, after Korea the Marines began to emphasize their separate service status as the Nation's "expeditionary force-in-readiness"
  - From 1947-1978, the Commandant of the Marine Corps (CMC) served only as a part-time member of the Joint Chiefs of Staff (JCS), invited only when matters touched on the Marine Corps
  - However, the Defense Appropriations Act of 1979 recognized the CMC as a full time member of the JCS

CSBA

Marginal Notes, Ship's Log, Page Four (2)

- As suggested by the DoN's experience in the Expeditionary Era, with a strong, common operational vision to link its two services together, the Marine's increasing confidence and the official designation of the CMC as "equal" to the CNO would not necessarily have led to as rapid a divergence of service operational visions as occurred in the mid- to late-1980s. As evidence:
  - Initial USMC support of the Maritime Strategy led to the development of the NALMEB and land-based USMC aircraft being integrated into the overall Maritime Strategy
  - USMC amphibious operations were planned in Thrace and in the Pacific in support of the Maritime Strategy
  - The Navy incorporated a requirement to lift the assault echelons of a MAF and a MAB as part of the "600-ship Navy"

- However, without a close operational linking vision, the sharp divergence of Navy and Marine Corps world views was inevitable
  - For this reason, General Gray's prescient but abrupt turn away from the Maritime Strategy was to have profound effects on the Navy-Marine relationship, and on the level of comity within the DoN
  - General Gray refocused the Corps on its expeditionary-force-in-readiness role, and replaced the word "amphibious" with "expeditionary" in MAGTF titles
  - The institutional Navy, an understanding but never overly enthusiastic supporter of a post-war amphibious TSBF component, generally welcomed the new Marine direction, as it allowed the Navy to continue to refine its focus on strike
    - The prestige of the Navy's "Gator" and mine warfare communities, never that high, was reduced even more, even though both communities received new ships and capabilities

CSBA

Marginal Notes, Ship's Log, Page Four (3)

- As a result of the gradual divergence in Marine and Navy operational visions, intra-DoN budget fights, always contentious, became even sharper during the period of deficit–driven defense budget reductions after 1985

- Budget fights were especially contentious in "Blue-in-Support-of-Green" programs:
  - Because of the centrality of aviation in the Navy's operational strike vision, and the equally central importance of aviation in the Marines' self-contained Marine Air-Ground Task Force (MAGTF) concept, the amount of resources devoted to Marine Corps aviation was a constant bone of contention between the two services
    - The USMC share of DoN aviation had been steadily climbing ever since the Marine development and embrace of the concept of vertical envelopment, which demanded substantial DoN support of Marine rotary wing aircraft
    - The Marine's pursuit of aircraft that could not be easily incorporated in the carrier deck cycle (first, the AV-8 Harrier VTOL fighter, and second, the F/A-18D strike fighter) simply added fuel to the debates
  - Of course, amphibious lift requirements were the subject of continuous, intense debate and disagreement
  - Navy support of naval surface fire support also proved to be another area of constant fighting

CSBA

Marginal Notes, Ship's Log, Page Four (4)

- After the Korean War, the TSBF showed a steady decline in numbers as the huge World War II TSBF—which included large numbers of special purpose, single-mission ships—was gradually converted into a smaller force of more capable multi-mission ships:
  - Between 1951 and 1960, the TSBF ranged between 872 and 1113 ships
  - Between 1961 and 1970, the TSBF ranged between 743 and 932 ships
  - Between 1971 and 1980, the TSBF ranged between 523 and 752 ships
  - Between 1981 and 1990, the TSBF ranged between 521 and 594 ships

- However, as the size of the TSBF declined, the size and capability of its individual ships rose
  - An aircraft carrier's FLD rose from approximately 30,000 tons to nearly 100,000 tons
  - A "destroyer's" FLD rose from approximately 3,500 tons to over 8,000 tons
  - A "frigate's" FLD rose from approximately 2,000 tons to over 4,000 tons

CSBA

Ship's Log, Page Five

- **Fourth (and current) leg: 1989-present (Breaking Away)**
  - With the fall of the Berlin Wall in November 1989, which marked the concession by its only credible competitor, the US became the sole superpower
    - US military capabilities rapidly began to outpace potential foes and allies as all the US armed services began exploit the first and second order effects of the Guided Weapons Warfare "Revolution" (if in an uneven fashion)
  - With regard to the latter point, Desert Shield/Desert Storm—the first war of the era—had an especially dramatic impact on all service planning, as it:
    - Suggested the full potential of the Guided Weapons Warfare Revolution;
    - Highlighted the need for better Joint interoperability and cooperation; and
    - Highlighted the combat potential of Joint Multi-dimensional Battle Networks
  - After the collapse of the Soviet Union, the US conducted a relatively rapid draw-down of its Garrison Era forward garrisons
    - However, both to protect its regional interests and to reassure its allies that the US would remain globally engaged, the US decided to keep 100,000 personnel in both Europe and Asia
    - The remainder of the combat forces were either demobilized or repositioned in the continental US (CONUS)
  - The primary role of the military shifted to conducting rapid, global Joint power projection operations, with a particular focus on the Greater Asian littoral that extends from the Persian Gulf (Southwest Asia) to North Korea (Northeast Asia)
    - Early era operations were (and continue to be) greatly facilitated by the residual Garrison Era overseas basing structure

CSBA

Ship's Log, Page Five (2)

- Joint expeditionary operations thus became the model and gradually the norm, as mandated by Congress in the Goldwater-Nichols Act of 1986, and as demanded by the high Joint operational tempo through the 90s
  - The DoN rotational base for Joint expeditionary deployments, well developed by its Garrison Era rotational deployment pattern, was well suited to the new era
  - Within a decade, the Air Force introduced its Aerospace Expeditionary Force (AEF) concept, a knock-off of the Navy-Marine expeditionary rotation base model
  - The Army, pre-occupied with managing a nearly 50% drawdown in its active forces, a high operational tempo, and numerous peacekeeping tasks, was the only service that failed to fashion a robust expeditionary rotation base

- With regard to preparing for future defense challenges, the 1993 Bottom-Up Review (BUR) essentially projected the continued American dominance in the Guided Weapons Warfare Regime, and US defense strategists focused initially on operational problems closely aligned with the Garrison Era
  - War planning "regionalized" the Garrison Era inner-German border defensive problem, focusing on "rapid halts" of two simultaneous or near-simultaneous "major regional contingencies" (MRCs)
    - The three general planning scenarios focused on Iraqi invasion of Saudi Arabia or Kuwait, a crisis with China over Taiwan, and a North Korean invasion
  - As all of the services were in the midst of a modest demobilization of their large Garrison Era forces, this planning depended on an aggressive pursuit of both guided weapons and the networking architecture required to support the formation of Joint Multi-dimensional Battle Networks

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Ship's Log, Page Five (3)

- What the DoN was generally tasked to do:
  - Project naval and Joint power "*From the Sea:"* deliver Joint goods and services across the oceans, and support Joint campaigns from close-in littoral seas
  - The DoN initially approached this tasking by making a straight-line adaptation of its Garrison Era posture of keeping combat credible forces forward in two or three theaters —especially Carrier Battle Groups and ARG/MEUs
    - Indeed, the DoN's carrier force structure was justified first by the size of the force needed to support rotationally-deployed Battle Forces forward, and second to compress US response times during emerging crises

- Early post-Garrison Era military operations seemed to confirm the BUR's vision of future warfare
  - Operation Deliberate Force in Bosnia sparked an even more aggressive pursuit of guided weapons and Joint Multi-dimensional Battle Networks
  - The 1997 Quadrennial Defense Review (QDR) endorsed the basic BUR planning construct of two "major theater wars" and two "rapid halts"
  - Both also hastened calls for a new vision of light, rapidly deployable ground forces supported by Joint guided weapons fire

- However, in an important new development, both the 1997 QDR and the closely associated but independent National Defense Panel warned that future access to forward bases would be increasingly less assured over time, because:
  - Political access would have to be negotiated rather than counted upon;
  - Vulnerability of fixed forward sites to guided ballistic and cruise missiles armed with guided sub-munitions and possibly WMD warheads would likely increase over time; and

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Ship's Log, Page Five (4)

- Anti-access/area denial (A2/AD) capabilities, especially those enabled by commercially available technologies, would likely proliferate over time

– A troubling, related development was the increasing "nuclearization" of the Greater Asian littoral, since nuclear weapons could offset to some degree the US advantage in the Guided Warfare Weapons Regime
  - By 2000, Pakistan joined China, India, and Israel as nuclear powers
  - N. Korea and Iran both aggressively pursued the capability
    – North Korea just declared itself a nuclear power, and Iran is widely expected to become one
  - Ironically, then, while the US pursued guided weapons so that it would not have to resort to tactical nuclear weapons, US adversaries were forced to pursue nuclear weapons in order to redress the huge lead the US had in conventional Guided Weapons Warfare Regime

– An equally troubling development was the gathering strength of a global Radical Islamic insurgency, which was generally missed or discounted by the majority of Defense planners
  - The 2001 QDR—published immediately after, but written well before the 9-11 attacks—again codified the basic BUR planning construct, by simply substituting "major combat operations" (MCOs) for the BUR's "MRCs" and the 1997 QDR's "major theater wars" (MTWs), and two "swift defeats" for two "rapid halts"
  - The 2001 QDR also introduced the idea of "regime change" operations, directed that the services start to take seriously the threat of future anti-access/area denial networks in their force planning, and introduced the idea of a "near peer competitor"—code word for a rising China
  - Beyond mentioning the threat of terrorism, the Radical Islamic insurgency was not mentioned as a major planning consideration

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Ship's Log, Page Five (5)

- Immediately after the attacks of 9-11, President Bush declared a "Global War on Terrorism," now commonly referred to as the GWOT
  - President Bush described the war in terms of a "generational commitment"
  - Gen Abizaid, Commander of CENTCOM, referred to the GWOT—the global counter-insurgency against Radical Islam—as "the Long War"

- The first major campaign of the global counter-insurgency, Operation Enduring Freedom (OEF) in Afghanistan, appeared to confirm thinking that light, "SOF-like" ground forces, supported by Joint multi-dimensional sensing and fire networks, might allow a reduction in the number of combined arms ground forces

- However, operations during the second campaign—Operation Iraqi Freedom (OIF)—highlighted a second reaction to US dominance in the Guided Warfare Weapons Regime (the pursuit of nuclear weapons being the first): "irregular" adversaries were turning to "fourth generation warfare;" guerrilla operations; close battle at the tactical level of war; ambush tactics; operations in complex terrain; and "death by a thousand cuts" to offset the US guided weapons lead
  - The long, unexpected occupation in Iraq once again highlighted the need for capable, general purpose ground forces

- The increasingly receding influence of the Garrison Era on US defense planning, the perception of increasingly uncertain forward access (real or imagined), the nuclearization of the Greater Asian littoral, and the implications of the "Long War" helped to prompt the first serious post-Garrison Era "global posture review"
  - The US appears to be moving toward forward "hubs" on US-controlled territory or on the soil of its closest allies, augmented by negotiated forward operating bases (FOBs), forward operating locations (FOLs), and cooperative security locations (CSLs)

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Marginal Notes, Ship's Log, Page Five

- While the Navy and Marines found it individually easy to adjust to the expeditionary nature of the new National Security Era, they struggled throughout the 1990s to find a common DoN operational vision

- The Navy, with no naval challenger to deal with or credible potential challenger to worry about, continued to hone its focus on fleet strike, and on improving the connectivity of its strike platforms within the emerging Joint Fires Network
  - Once again, the lack of a naval opponent led to decline in the TSBF, but at a much shallower rate than seen after World War II
    - Between 1991 and 2000, the TSBF declined from 529 ships to 341 ships
  - As a result of the disappearance of the Soviet submarine threat, the late Garrison Era introduction of the VLS, and new digital networking technologies, submariners lost prestige and clout to the resurgent, strike-empowered, surface combatant fleet—although not without a fight

- The post-Goldwater Nichols appearance of separate Marine components emphasized Marine "separateness" within the DoN even more, and clouded the priority placed by Marines on their Joint-linked "Marine Operating Forces" and DoN-linked Fleet Marine Forces (FMF) roles
  - The Marine became increasingly more assertive within DoD and the DoN, especially after they fended off early post-Garrison Era moves to reduce the size of their forces
  - The Marines continued to focus on their ***expeditionary force-in-readiness role***, especially for complex contingencies, which they referred to as "3-block wars"
  - However, because of the growing uncertainty over future access, the Marines once again began to think about large-scale operations from the sea

CSBA

Marginal Notes, Ship's Log, Page Five (2)

- As a result, throughout the 1990s, concepts like Operational Maneuver From the Sea (OMFTS), Ship-to Objective Maneuver (STOM), and Maritime Prepositioning Force 2010 were developed
  - However, because the operational world views of both the Marines and the Navy had drifted apart, these concepts were developed largely independently, with little Navy participation (but constant worry)
- Moreover, despite their renewed attention on maneuver from the sea, Marine Corps equipment decisions were routinely made with little regard to their impact on the DoN's amphibious lift "footprint"
  - As a result, the amphibious footprint of Marine Expeditionary Brigades began to outpace the lift capabilities of programmed ships—especially with regard to aviation assets

- With no common agreed upon operational vision to link them together, and with their ever-divergent world views, budget pressures during the post-Garrison Era "demobilization" led to increasingly poisonous fights between the Navy and Marines over Blue-in-Support-of-Green programs
  - Marine pursuit of the MV-22 was an especially thorny issue between Navy and Marine planners, especially after the V-22 was cancelled by DoD in 1989, but was reinstated by Congress after aggressive Marine lobbying efforst
  - A revised amphib lift requirement for 3.0 MEB—itself a reduction from the Garrison Era requirement to lift the assault echelons of a MEF and a MEB—was further "fiscally constrained" to 2.5 MEB lift
  - Navy promises on naval surface fire support were continually revised, and delayed

Marginal Notes,
Ship's Log, Page Five (3)

- In 1998, the Marines abruptly removed their last ship detachments from aircraft carriers with little prior consultation or approval by Navy or DoN leadership
  - The level of trust and comity within the DoN reached a post-World War II low

- Between 1999 and 2001, due first to the concerted efforts of Secretary of the Navy, Chief of Naval Operations, and the Commandant of the Marine Corps, and later due to the operational cooperation demanded by the GWOT, the Navy and Marines moved haltingly to repair their intra-Departmental relations and to improve their level of mutual trust
  - The Navy and Marines agreed to more fully integrate their tactical aircraft plans ("Tac-Air Integration")
  - A Marine General commanded Task Force 58 (TF 58), an expeditionary sea base established off the coast of Pakistan in support of combat operations in land-locked Afghanistan

- The new concept of Sea Basing, first officially revealed in October 2002 in the Navy's *Seapower 21* concept paper (and subsequently adopted as the DoN's vision statement), can perhaps help to re-forge a level of trust and operational cooperation not seen in the DoN since the end of World War II
  - However, as will be discussed, it also has the potential to drive the Navy and Marines further apart

This Quick Review of the Ship's Log Highlights the Striking Similarities the Current Race Leg Shares With the Expeditionary Era

- This is especially true of the Interwar period. As in that era:
  - The size of the current TSBF is now roughly about 300 ships
    - Partly as a result, the Battle Fleet is moving to a surge posture from home waters very much reminiscent of the Interwar period
  - Departmental focus (both DoD and DoN) is shifting away from Europe and toward Asia
  - The DoN must hedge/prepare for the future possibility of confronting a powerful Asian naval power
  - Growing concern about the vulnerability and preemptive loss of forward bases and the potential rise of credible maritime A2/AD networks is forcing a reappraisal of DoN (and to some extent Joint) naval maneuver and forcible entry capabilities, as well as sea-based logistical support of Joint forces operating ashore
    - As mentioned, the current conceptual driver is Sea Basing: using our command of the seas to use the sea as maneuver space, as an operational sanctuary, and as a base for combat operations
  - And, although the services are much richer today than they were in the 1930s, Battle Force planning options are practically constrained by the "DoD budget treaty," deficit concerns, and by continued pressures on procurement funding

Moreover, as in the Interwar Period, the DoN is in the Early Stages of a Shift to a New Battle Force Era

- The winds behind the shift in Battle Force eras is caused by the shift to a new National Security Era, and strengthened by:
  - The continuing maturation of Guided Weapons Warfare Regime, now six decades old, which dominates conventional warfare at the operational and tactical levels
  - The steadily increasing costs of the All Volunteer Force, which are spurring more aggressive moves toward automation, crew reductions, and unmanned systems
  - The legislative mandate for Joint warfare and the rise of Joint Multi-dimensional Battle Networks
  - The transition from a 100-year long Battle Force emphasis on sea control and strike to "guaranteeing delivery of goods and services" in support of Joint multi-dimensional campaigns
    - ***Ensuring and maintaining operational access and Joint freedom of action in the world's littorals is now DoN "Job One"***
  - The steadily increasing power of sensors and information technologies, which is allowing the ***networking of networks***, and resulting in improved shared awareness and collaborative planning throughout the Joint force
  - The high costs of submarines and warships (and airplanes and military equipment)

Just as the Frigate Era gave way to the Battleship Era
And the Battleship Era gave way to the Carrier and SSN Eras
These six broad forces are impelling a shift toward a
New Battle Force Era

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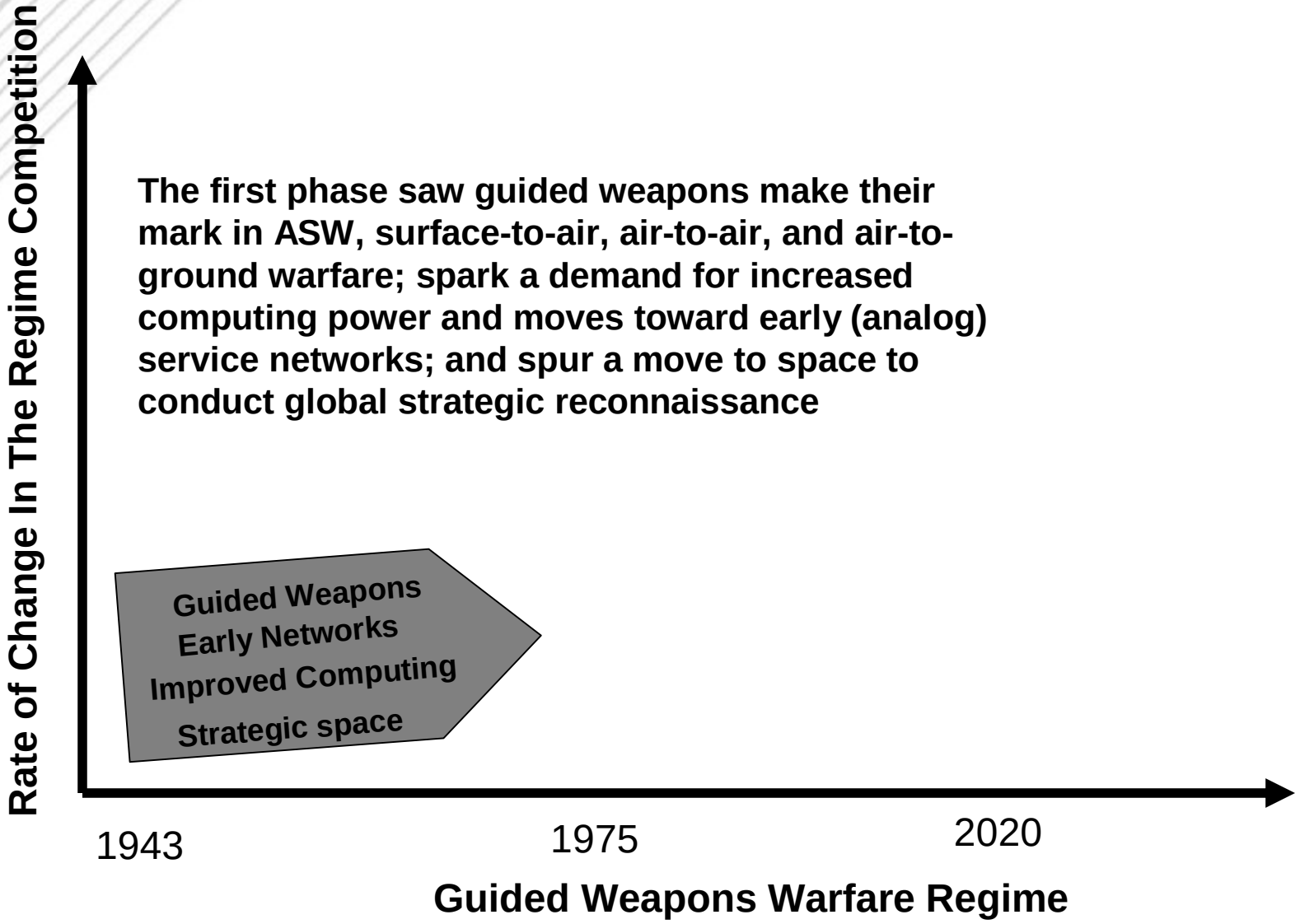
So, When Considering Imminent Changes to the Battle Forces' Course and Speed, What's the Base Course for the Current Leg of the Race?

- Said another way, what should we call the current race leg? What is the most applicable name for the current National Security Era?
- How about ***The Joint Expeditionary Era?***
  - Winston Churchill succinctly described the fundamental characteristics of the first Expeditionary Era in October 1942. These characteristics seem perfectly apt today. To paraphrase Churchill:

    The whole power of the United States, to manifest itself, depends on the power to move ships and aircraft across the sea. Their mighty power is restricted; it is restricted by the very oceans which have protected them; the oceans which were their shield, have now become both threatening and a bar, a prison house through which they must struggle to bring armies, fleets, and air forces to bear upon the common problems we have to face.

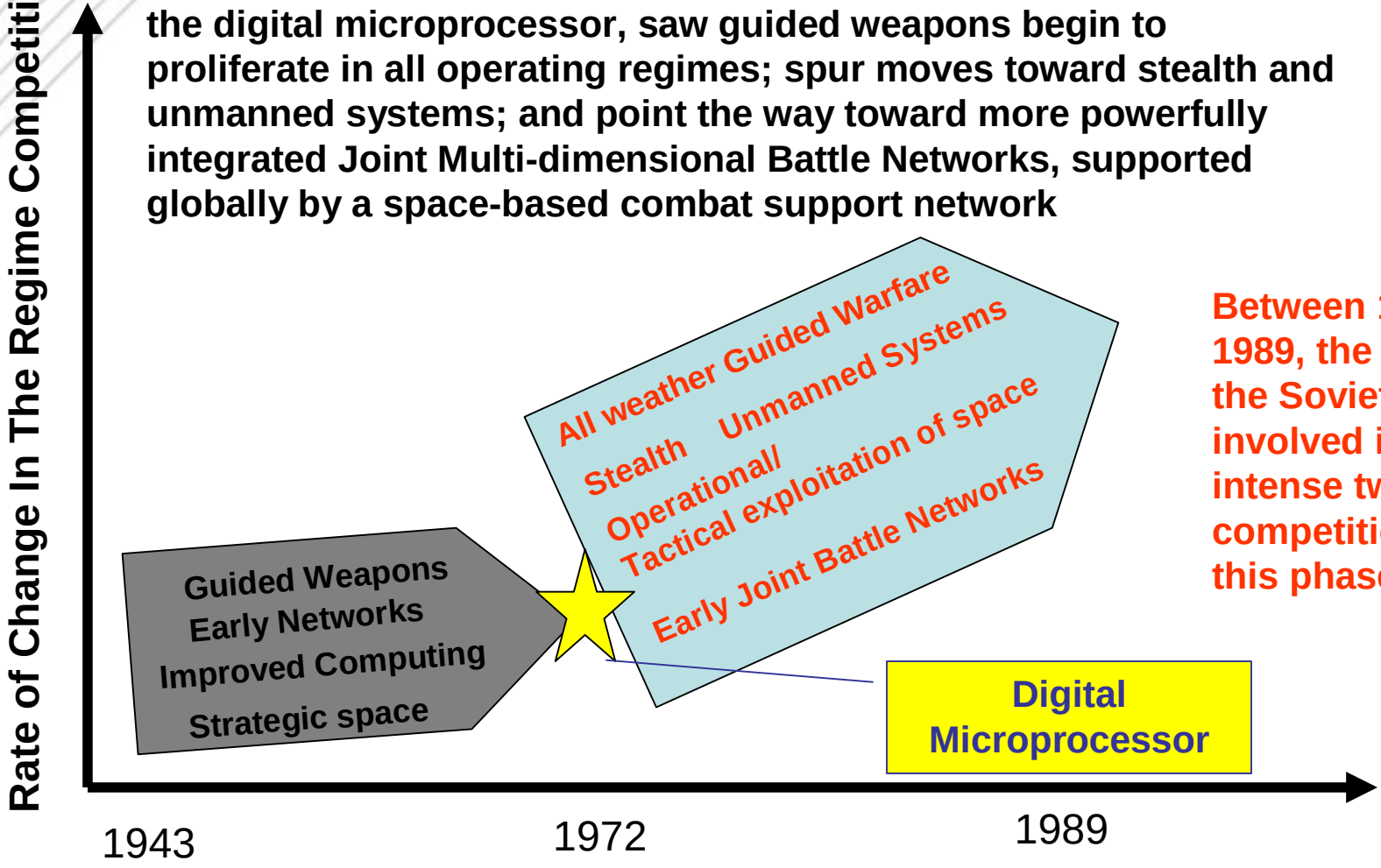
  - For the US armed services as a whole, the key differences between Churchill's conception of the first Expeditionary Era and the current Joint Expeditionary Era are that contemporary US expeditionary operations are "born Joint," involving much closer planning, execution, and reliance among the four armed services; and these Joint operations are dramatically more powerful due to the effects of the Guided Warfare Regime/Revolution

With Regard to the Latter, The Guided Weapons Warfare Regime Has Thus Far Seen Three Distinct Phases



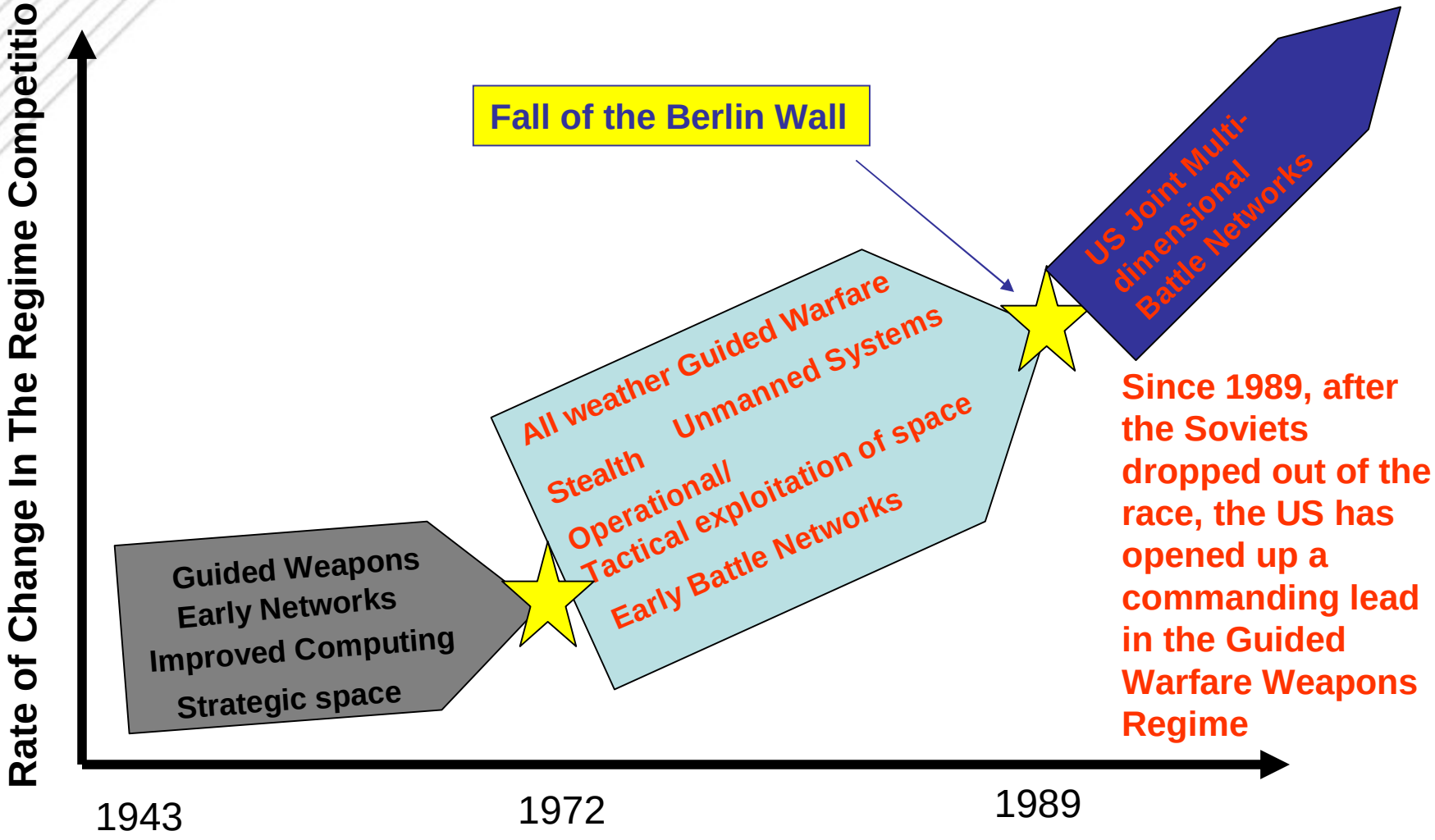
The Second Phase of the Regime Saw True "Revolutionary" Change

The second phase of the regime, initiated by the development of the digital microprocessor, saw guided weapons begin to proliferate in all operating regimes; spur moves toward stealth and unmanned systems; and point the way toward more powerfully integrated Joint Multi-dimensional Battle Networks, supported globally by a space-based combat support network



Between 1972 and 1989, the US and the Soviets were involved in an intense two-way competition in this phase

The Third Phase Saw a US Monopolistic Exploitation of the Regime



Since 1989, after the Soviets dropped out of the race, the US has opened up a commanding lead in the Guided Warfare Weapons Regime

Initial DoN Course Corrections are Suggested by the Four Key Differences Between Race Conditions in the Joint and First Expeditionary Eras

- First, the dominating US lead in the Guided Warfare Regime gives all US armed forces an enormous advantage in confrontations with "traditional" conventional force threats
  - Indeed, there is likely excess force structure capacity for the post-Garrison Era planning problem of responding to and "swiftly winning" two simultaneous MCOs
  - Said another way, it appears that some risk can be taken with regard to this low probability scenario, in order to create organizational "slack" to meet/prepare for new competitors or changes in the competitive environment

- Second, the US Navy and Marine Corps represent the world's leading naval competitor, with a range of capabilities that are without precedent in modern naval history
  - This suggests that the DoN should be able to exploit its maritime dominance to better enable and support Joint global military operations in the near term, and at the same time begin to shape the TSBF to meet future challenges

- Third, Joint requirements influence the development of service operational capabilities to a degree unheard of in the Interwar period
  - This suggests that the development of any major new naval capability should have Joint support requirements clearly in mind, and that the future naval platform architecture should support a variety of Joint forces/operations

- ***Fourth, and most importantly, the nation finds itself in the midst of a violent storm—a global war against an implacable transnational foe***
  - This demands that the Battle Force first be changed to meet and defeat this current challenger

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The Following General Observations From the Ship's Log Should Be Kept in Mind When Considering Changes to the DoN's Racing Strategy

- The 2005 Quadrennial Defense Review, promises to be the first true strategic ***review*** since the end of the Garrison Era (with the possible exception of the aforementioned Global Posture Review)
  - The flag officers now on duty have served at about half their careers in the post-Gold Water Nichols, post-Garrison Era, National Security Era
    - In other words, the influence of the Garrison Era's long Cold War is rapidly receding, and the character of the new National Security Era is being viewed through clearer lenses
  - The "Global War on Terrorism" and the emergence of new competition conditions and challengers are highlighting the need to make changes to the overall DoD racing strategy, which will in turn help to guide DoN changes to their supporting racing strategy
  - Increasing budget pressures are forcing all defense strategists and planners—not just DoN planners—to consider and make more pointed prioritizations and "platform architecture" decisions

- The delay in understanding the requirements for the new National Security Era is quite consistent with past inter-era shifts, which have always been characterized by high degrees of uncertainty and a desire to limit defense expenditures
  - The shift from the Revolutionary War to the Continental Era saw the complete disestablishment of the Continental Army, Navy and Marine Corps, and debates over whether "paying off" overseas pirates would be less costly and risky than building a DoN Battle Force (debates were not resolved for 11-15 years)

General Observations, Ship's Log, Pages One-Five (2)

- The shift from the Continental to the Expeditionary Era was marked by sharp and pointed debates about whether the US should expend its scarce resources for a large Navy, or become a more active "imperialistic" world power (this debate was not resolved for approximately a decade; the idea of creating a large standing peacetime Army was never a serious part of the debate)
- The shift from the Expeditionary Era to the Garrison Era saw an initial reliance on nuclear weapons for national defense, and a desire to save money by cutting ground and naval forces (a policy not changed for a decade and a half)
- The shift to the Joint Expeditionary Era saw an initial reliance on guided conventional weapons and Joint Battle Networks for national defense, and a desire to free up resources for "transformation" by cutting ground forces

– ***In other words: 16 years after the Fall of the Berlin wall is a perfect time to conduct an informed debate about the best naval platform architecture for the Joint Expeditionary Era***

– One last observation. Since 1890, through two complete National Security Eras and well into a third, the US has declared/ transitioned to wars involving division-size ground units on an average of once every 16.1 years, with a range of eight to 26 years
  - The average period of peace between these wars has been 13.2 years, with a range of five to 23 years
  - Despite optimistic prognostications about the demise of large-scale military operations due to globalization or other factors, history strongly suggests the US military should hedge its bets, and retain the capability to mount them

Forecasts of Competition/Racing Conditions

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Running Before the Storm

- As in any competition, the over-riding focus of effort must first be on confronting the most threatening current challenge: the global Radical Islamic insurgency (referred to hereafter in the current vernacular, the GWOT)

  "We have entered an era of enemies without country or conscience, who operate in small cells scattered across the globe. The world has changed, and so must we."

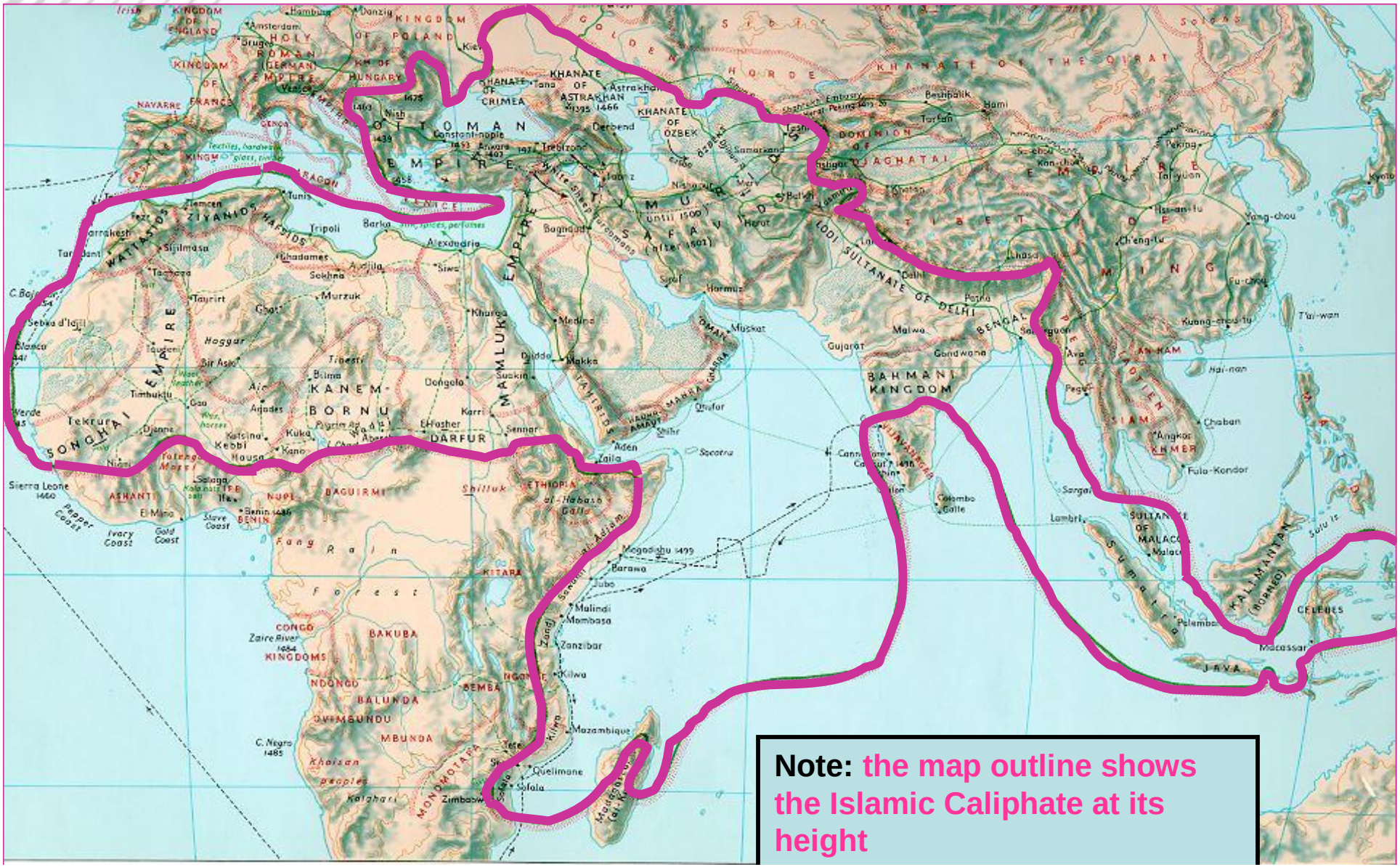
  Secretary of Defense Donald Rumsfeld

- There are three primary reasons why the GWOT is sure to cause important changes in the US naval platform architecture and its operating patterns
  - First, the GWOT "storm" is expected to last for such a long time. As Admiral Clark recently said:

    "We are talking about a conflict that is going to last years, not months—perhaps 30 years—based on a clash of principles and values."

  - Second, the Islamic insurgents operate primarily in cellular networks inside operational sanctuaries located on land:
    - Under pressure from US counter-attacks, the insurgents will likely seek other operational sanctuaries, either by moving or expanding their operations into "ungoverned areas," or by dispersing and hiding their cellular network across even broader swaths of territory

And Third, The GWOT "Central Theater" Defines an Operational Battlespace Different Than Those Found in Past US Wars



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Just Like the Pacific in World War II, "The Indian Ocean and its Adjoining Seas and Gulfs Form One Crucial, Integrated Strategic Theater"

- *"The Indian Ocean theater contains the world's largest democracy (India), the world's most populous Muslim state (Indonesia), the greatest concentration of oil (on the Arabian Peninsula and in the Persian Gulf), the first Muslim nuclear power (Pakistan), the most progressive economies in Southeast Asia (Singapore, Malaysia, and Thailand) and the greatest concentration of terrorists in the world."*

- *"This is where Islam must—and can—change; where nuclear weapons are likeliest to be used; where the future economic potential is vast; where the bulk of the world's heroin is produced; and where the heroin of the world economy—oil—could be cut off with a handful of nuclear weapons (think Iran, the Suez Canal, and a few Arab ports)."*

- *"…our Navy remains the lead service for security affairs in the Indian Ocean. The Air Force will have a role in crises, while the Army and Marines will be needed to fight the region's ground campaigns of tomorrow (they're coming), but our naval presence is the indispensable military and strategic tool required by the Indian Ocean's strategic environment."*

Ralph Peters
"Tsunami Ripples"
New York Post, January 6, 2004

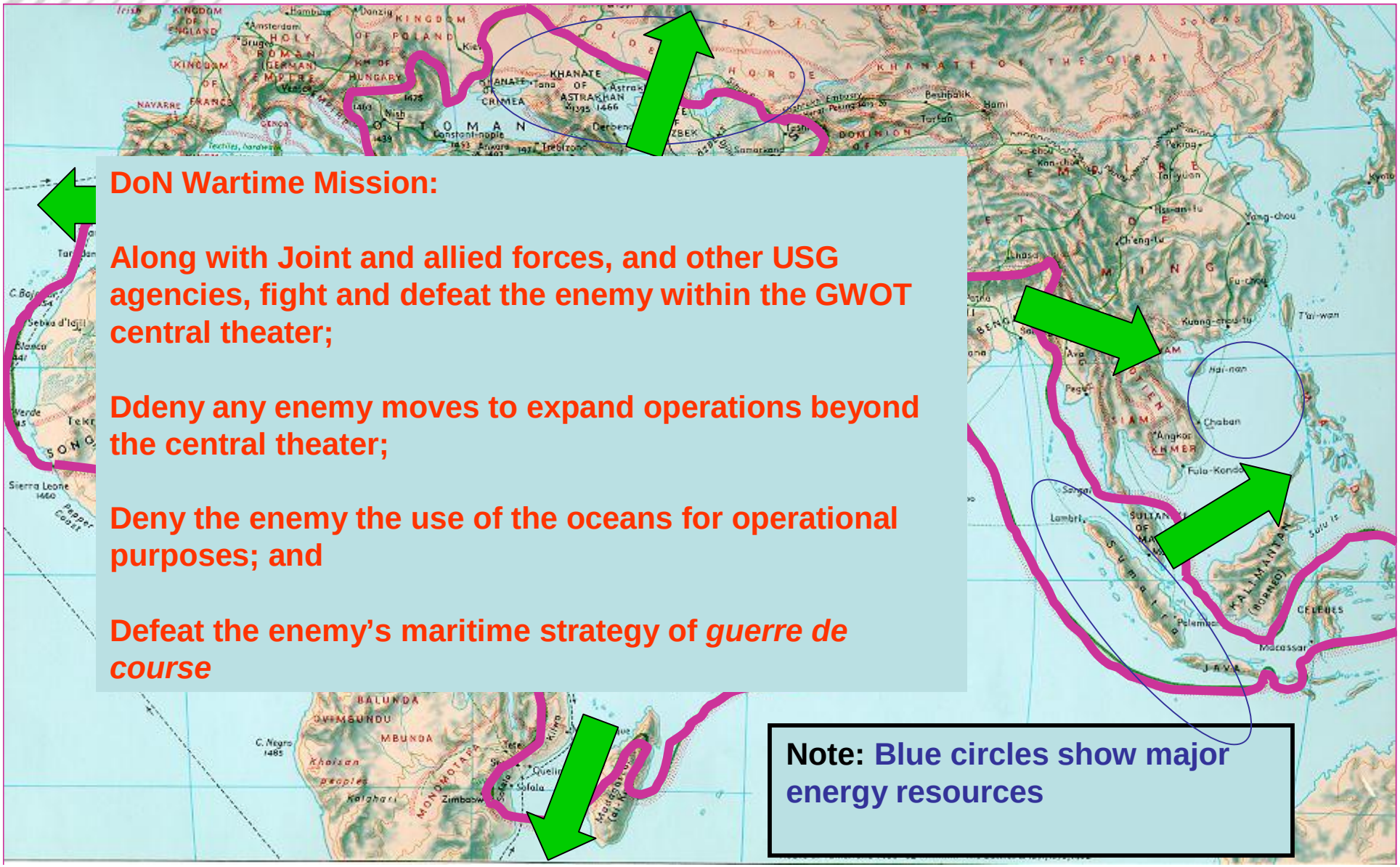
Moreover, Although the Radical Islamic Insurgents Do Not Have a Navy, They Have a Clear Naval Strategy

- The insurgents have shown that they can and will exploit the sea for operational purposes:
  - Operating under "letters of marque" (*fatwas*), and using boats, small vessels or converted and seized vessels, Radical Islamists have demonstrated themselves capable of mounting irregular, surprise attacks on single, unwary combatants and commercial vessels, both at sea and in port
  - The insurgents have also demonstrated an intention and capability to attack offshore energy targets, including both oil and gas tankers in transit and offshore energy platforms

- In other words, the enemy's primary "naval strategy" is to conduct ***guerre de course***—or commerce raiding
  - As the DoN learned full well in the Continental/Frigate Era, one of the primary means to counter a strategy of *guerre de course* is to establish a close blockade of the enemy's coast, in order to prevent his commerce raiders from breaking out and operating on the open sea

- The enemy also maintains a "threat-in-being" to use the oceans as an avenue of approach to mount unconventional or catastrophic attacks against the US homeland

So, Time To Reef Sails—Make Adjustments to Naval Platform Architectures and Battle Fleet Deployment Patterns—and Ride Out the Storm



Despite the Central Importance of Dealing With Current Race Conditions and Competitors, the US Race Strategy of Enduring Maritime Supremacy Compels Naval Planners to Pursue Additional Capabilities That Will Allow Them to Prevail Against Any Future Competitor, Under Any Race Condition

Potential Race Challengers

Irregular **Traditional** **Catastrophic** **Disruptive**

Race Goals

Reassure

Dissuade

Deter

Defeat

The 2005 Quadrennial Defense Review (QDR) is being conducted not only in the shadow caused by "the Long War," but in other shadows cast by a range of potential or perceived future challengers

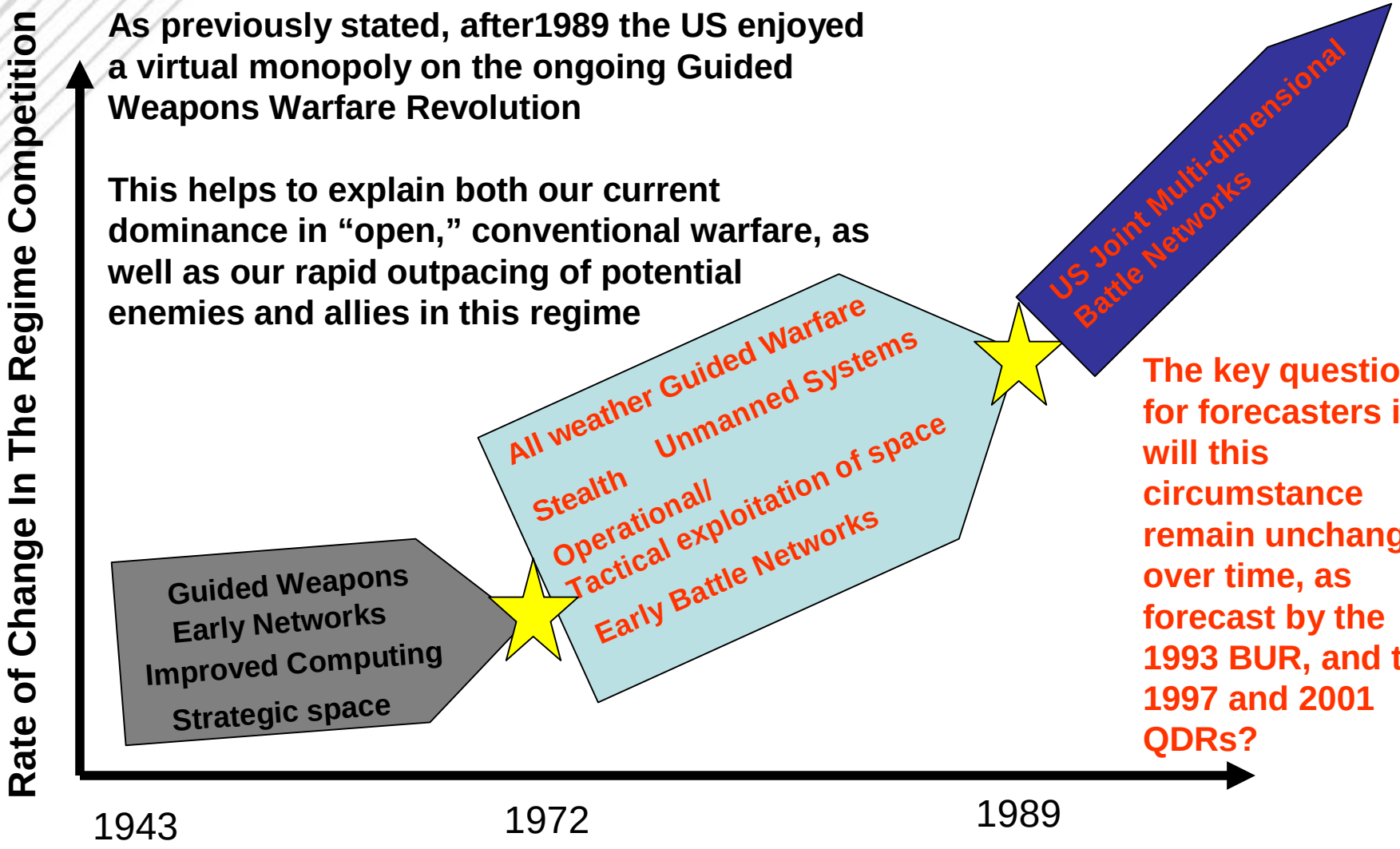
In addition to defeating the "irregular" challengers associated with the GWOT, the Battle Force will be expected to prepare for and to deal with future traditional, catastrophic, and disruptive race challengers

Forecasting which of these future challengers will be the most dangerous should also have a big impact on any alterations to our long-term competition strategy

What Types of *Future* Racing Challengers Should We Prepare For?

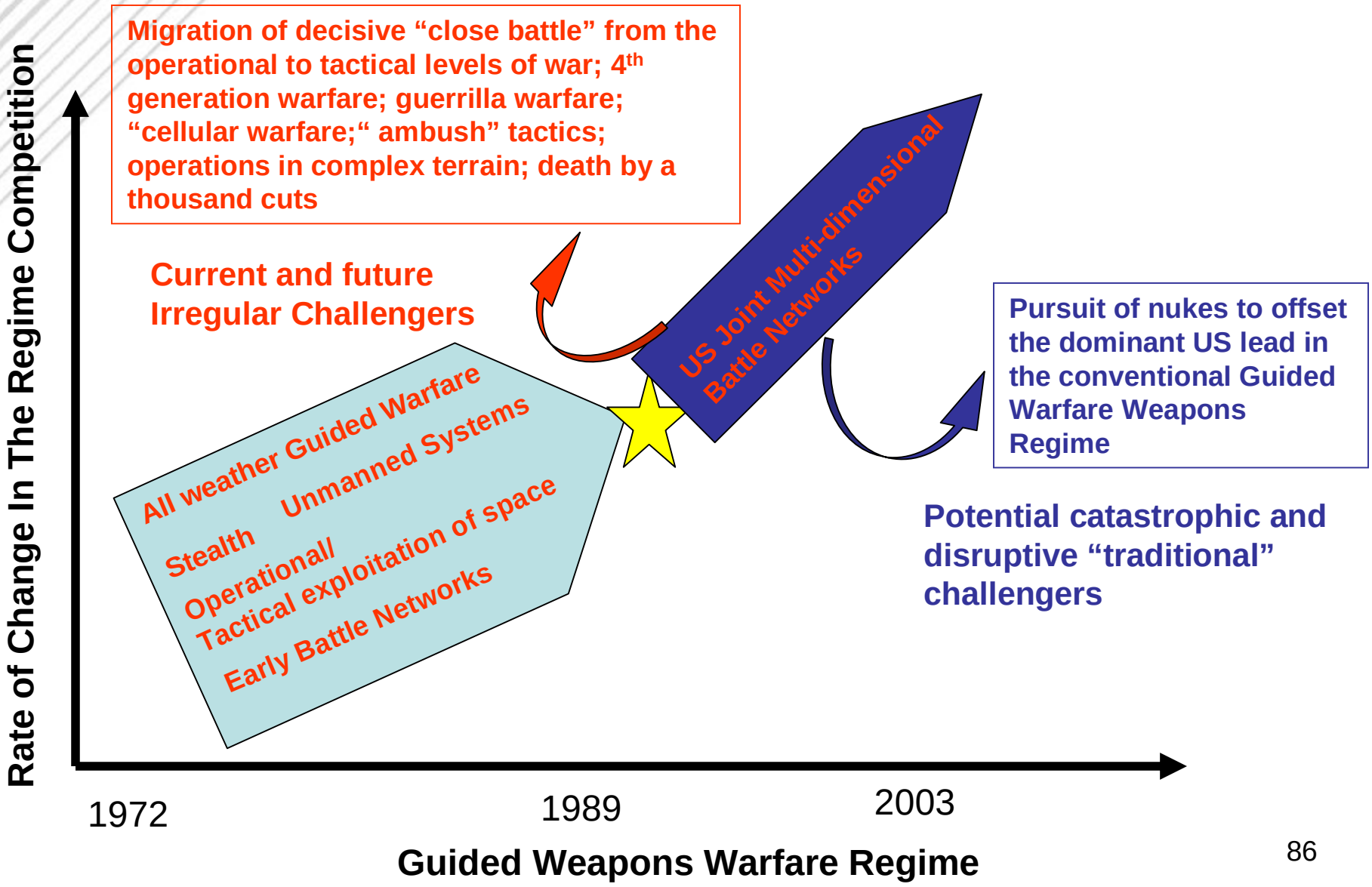
As previously stated, after1989 the US enjoyed a virtual monopoly on the ongoing Guided Weapons Warfare Revolution

This helps to explain both our current dominance in "open," conventional warfare, as well as our rapid outpacing of potential enemies and allies in this regime



The key question for forecasters is: will this circumstance remain unchanged over time, as forecast by the 1993 BUR, and the 1997 and 2001 QDRs?

In a Word, No: as Discussed, Race Competitors Already Have Adjusted Their Race Strategies



First Forecast: In Addition to Spurring Catastrophic Irregular Challenges, US Dominance in the Guided Weapons Warfare Regime Will Likely Spur a New Group of Nuclear-Armed "Traditional" Competitors

- The likelihood that nuclear weapons may be used in the Joint Expeditionary Era appears to be far higher than in the Garrison Era

- This forecast holds true for irregular challengers, who seek nuclear weapons to effect "catastrophic" changes in race conditions:
  - *"The worst potential WMD problem is nuclear terrorism, because it combines the unparalleled destructive power of nuclear weapons with the apocalyptic motivations of terrorists against which deterrence, let alone dissuasion or diplomacy, is likely to be ineffective."* Ashton B. Carter

- However, it also is equally (if not more) likely that a variety of traditional challengers will seek nuclear weapons (the ultimate defense "steroid") in order to offset the dominant US lead in the Guided Warfare Weapons Regime:
  - *"In Iran and North Korea…the picture is bleaker: the invasion of Iraq appears to have convinced leaders in those countries that they must have a nuclear capability of their own. Far from deterring them, the United States may have pushed them into finding ways to deter it."* John Lewis Gaddis
  - *"…nuclear capabilities of Iran and North Korea could very well cause their neighbors—Egypt, Saudi Arabia, Syria, and Turkey, and Japan, South Korea, and Taiwan--to reconsider their own nuclear options."* Jon B. Wolfsthal

Thus, it Seems Prudent That the DoN Racing Strategy Account for the Possibility That Future Naval Battle Forces Might Confront a Nuclear-Armed Regional Competitor

- *"States that have acquired nuclear weapons have so far handled them carefully. To take comfort in this pattern, however, is like trying to find reassurance in an extended game of Russian roulette: sooner or later the odds turn against you."*

  John Lewis Gaddis

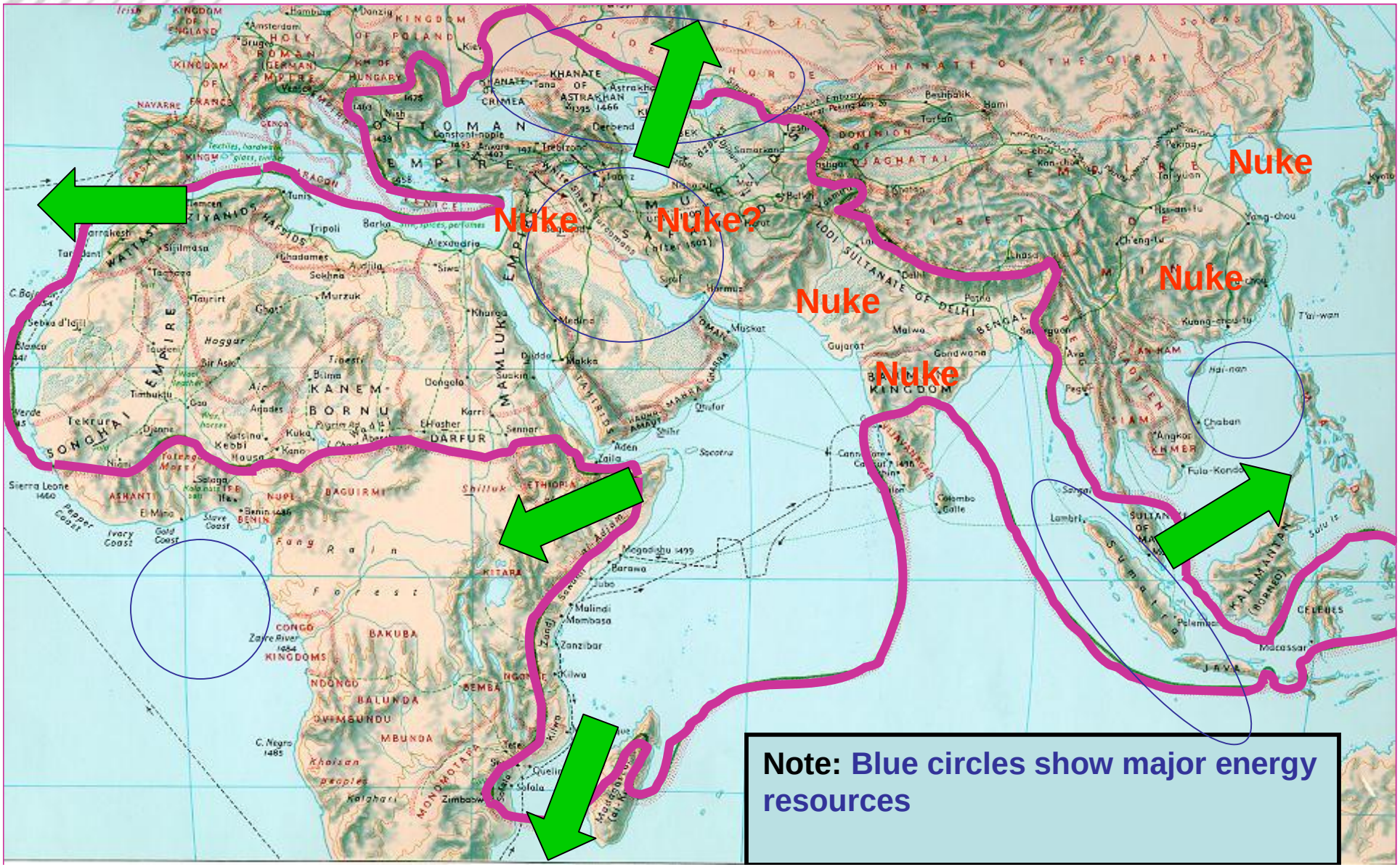
- *"Following the end of the Cold War, the United States military placed emphasis on planning for wars against regional opponents who lacked nuclear weapons. A key assumption on the part of the United States was that middle-sized regional powers such as Iraq or North Korea would not have nuclear arms. However, the emergence of a nuclear-armed Korea has rendered this assumption obsolete…This will change how the United States plans and executes combat operations against such nations."*

- *"All the services will need to come to grips with the realities of fighting in a military environment where there could be limited use of nuclear weapons. The joint operational concept of any future large-scale forcible entry operation and the ensuing campaign of regime change will have to be redesigned to minimize the vulnerability of those forces with nuclear attack."*

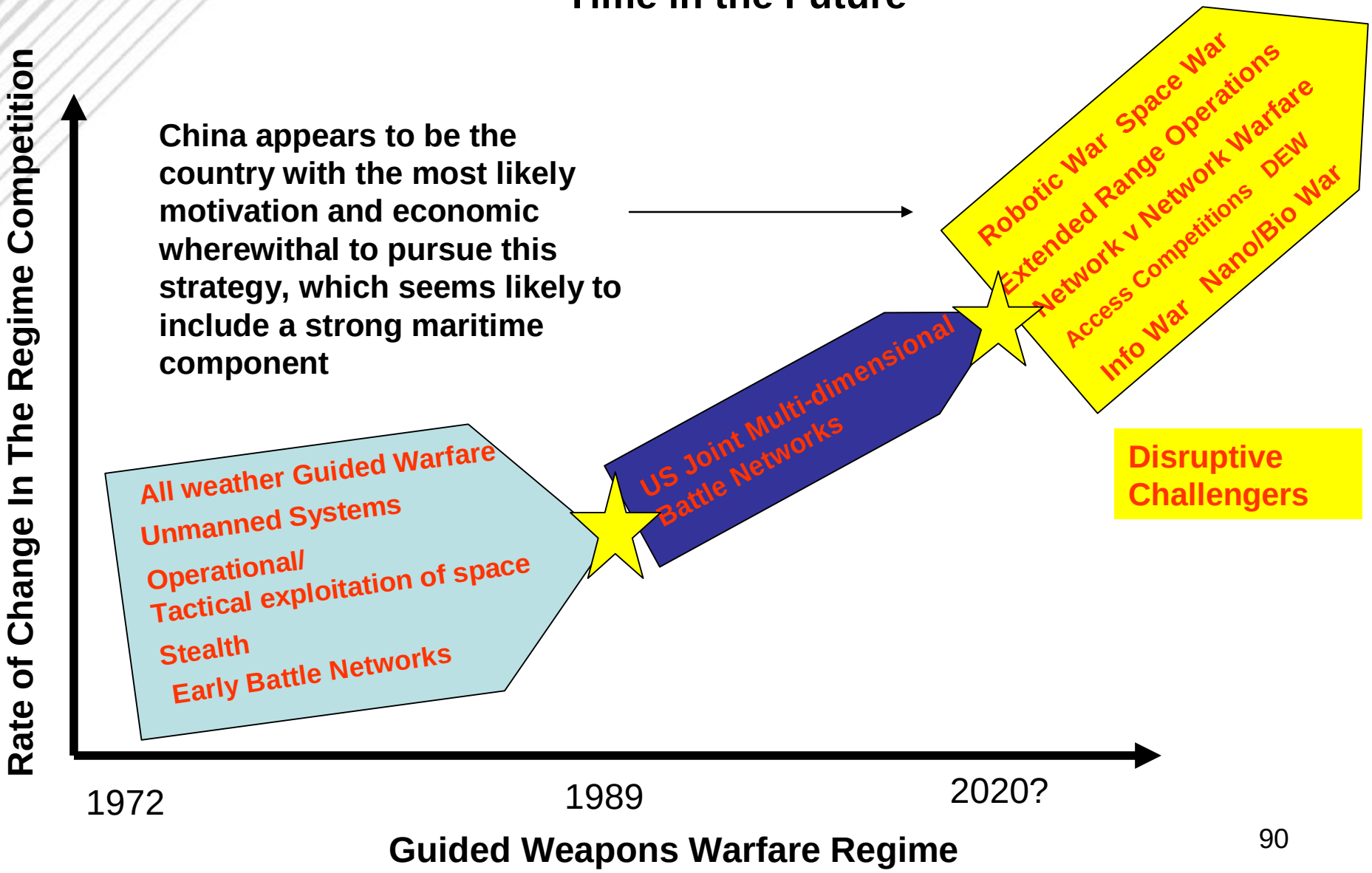
  F. Stephen Larrabee, John Gordon IV, Peter A. Wilson

- As this last quote suggests, this problem is *not* likely to involve a large number of nuclear weapons, or result in large nuclear exchanges; instead, it will require some new capabilities and changes in operational and tactical approaches to posture US forces to weather potential enemy strikes involving a relatively small number of nuclear warheads or other weapons of mass destruction (WMD)

The Range of Potential Nuclear Flashpoints is Closely Aligned With the Central GWOT Theater; the Problems are Closely Intertwined



Second Forecast: Still Other Competitors May be Planning to Enter the Race at a More Opportune Time in the Future



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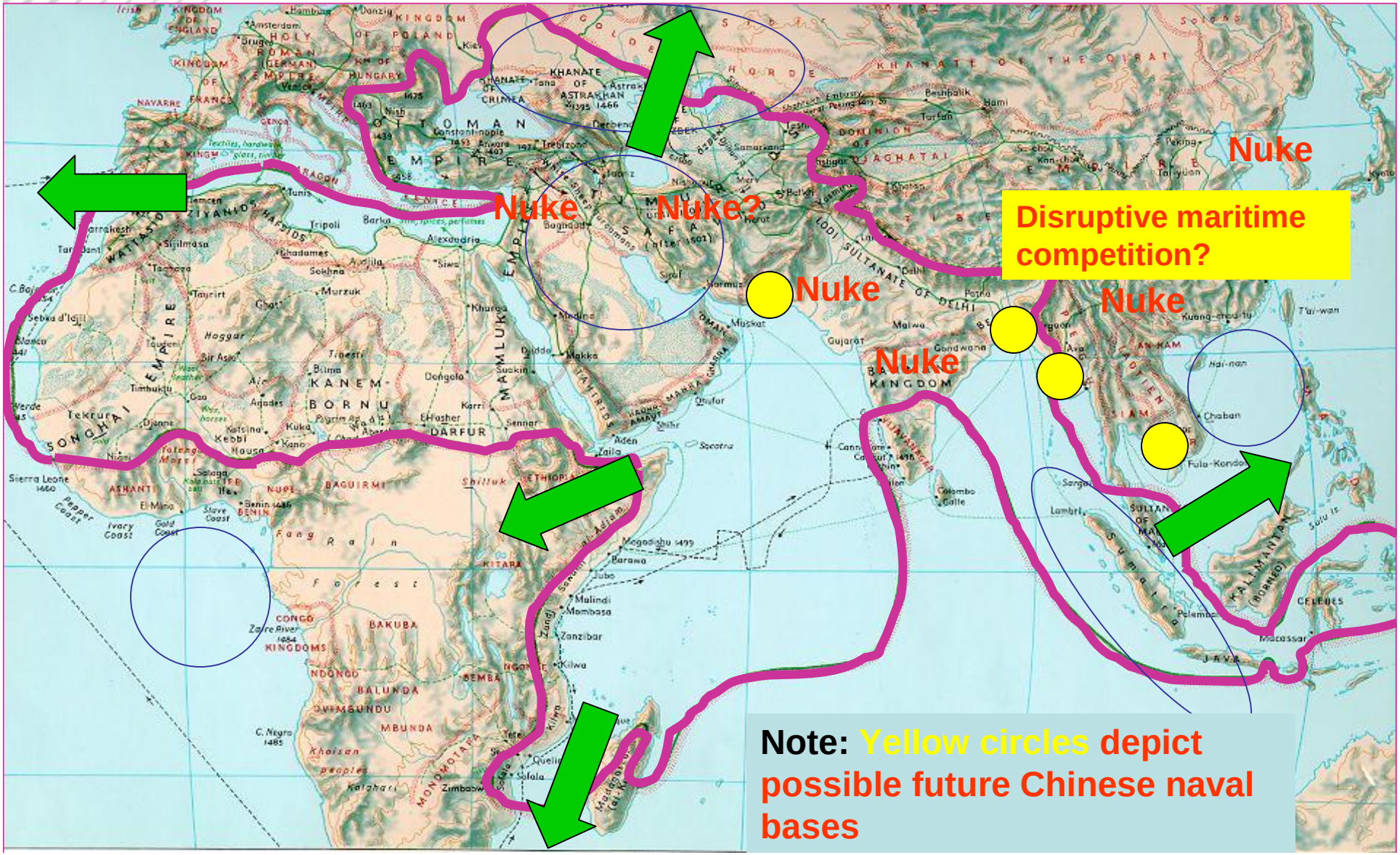
Under Any Circumstances, Chinese Naval Capabilities Appear Certain to Grow Over Time

- 'The Chinese have announced their intention to build a "600-ship" Navy
  - Chinese naval procurements are emphasizing long-range maritime strike aircraft, long-range anti-ship cruise missiles, surface combatants and submarines
- Although Chinese naval combat systems currently lag significantly behind those of the US, they have a world-class ship-building infrastructure and are experimenting with a wide variety of hull forms and propulsion systems
  - Increased cooperation with Russia and any relaxation of the European arms embargo might allow the Chinese to more quickly catch up in combat systems than might otherwise be expected
- In addition, China appears to be pursuing an overseas basing structure to protect its long energy sea lines of communication from the Persian Gulf
  - The Chinese are bursting potential naval basing arrangements with Pakistan; Bangladesh; Burma; and Cambodia
- One need only to reread Samuel Huntington's aforementioned 1954 *Proceedings* article to appreciate the need to hedge against a future global naval competitor
  - In 1954, with the Soviet naval challenge still in its infancy and the DoN still enjoying a period of unquestioned US naval superiority, Huntington recommended that the Naval Service consider the "sea as base," and concentrate its efforts on projecting power ashore
  - However, 20 years later, after returning from its long power projection operation off the coast of Vietnam, the fleet found itself confronted by a resurgent Soviet Navy capable of mounting a serious open-ocean challenge

These Three Current and Potential Future Challenges Help to Define the DoN's "New Map"—a Navigational Chart for the Emerging Naval Competition in the Joint Expeditionary Era



Our Long-Term Race Strategy Must Therefore Account For One Definite and at Least Two Possible Adjustments Off the Base Course

- Adjust course and speed to fight the GWOT. These adjustments must account for:
  - A distributed close blockade and sea control within the central GWOT theater;
  - Offensive Joint combined arms operations in the central GWOT theater;
  - Economy of force operations in adjacent theaters to prevent enemy attempts to expand the theater, especially into ungoverned sanctuaries;
  - Stability operations in central and adjacent GWOT theaters; and
  - Securing the maritime approaches to the United States
- Prepare to adjust Battle Force course and speed to prepare for possible counter-terrorist, counter-proliferation, or power projection operations in which a small number of nuclear weapons might be used against US or allied forces
- Prepare to adjust Battle Force course and speed to respond to a potentially disruptive maritime competition with China

These Three Course Variations Will Occur Under Different Racing Conditions, Defined Principally by the Degree of Littoral Maritime Access

- Because of its current dominant margin of naval superiority, the US Battle Force is not likely to be challenged on the open ocean for some period of time: its primary job will be to deliver Joint goods and services across the oceans and through the world's littorals in support of Joint multi-dimensional campaigns

- ***The world's littorals are thus likely to become the near- to mid-term "contested zone" in the ongoing naval competition***
  - The degree of littoral maritime access determines the time and effort a naval Battle Force must expend before being able to operate freely in the waters contiguous to a Joint Operating Area, or JOA

- There are four varying degree of littoral maritime access:

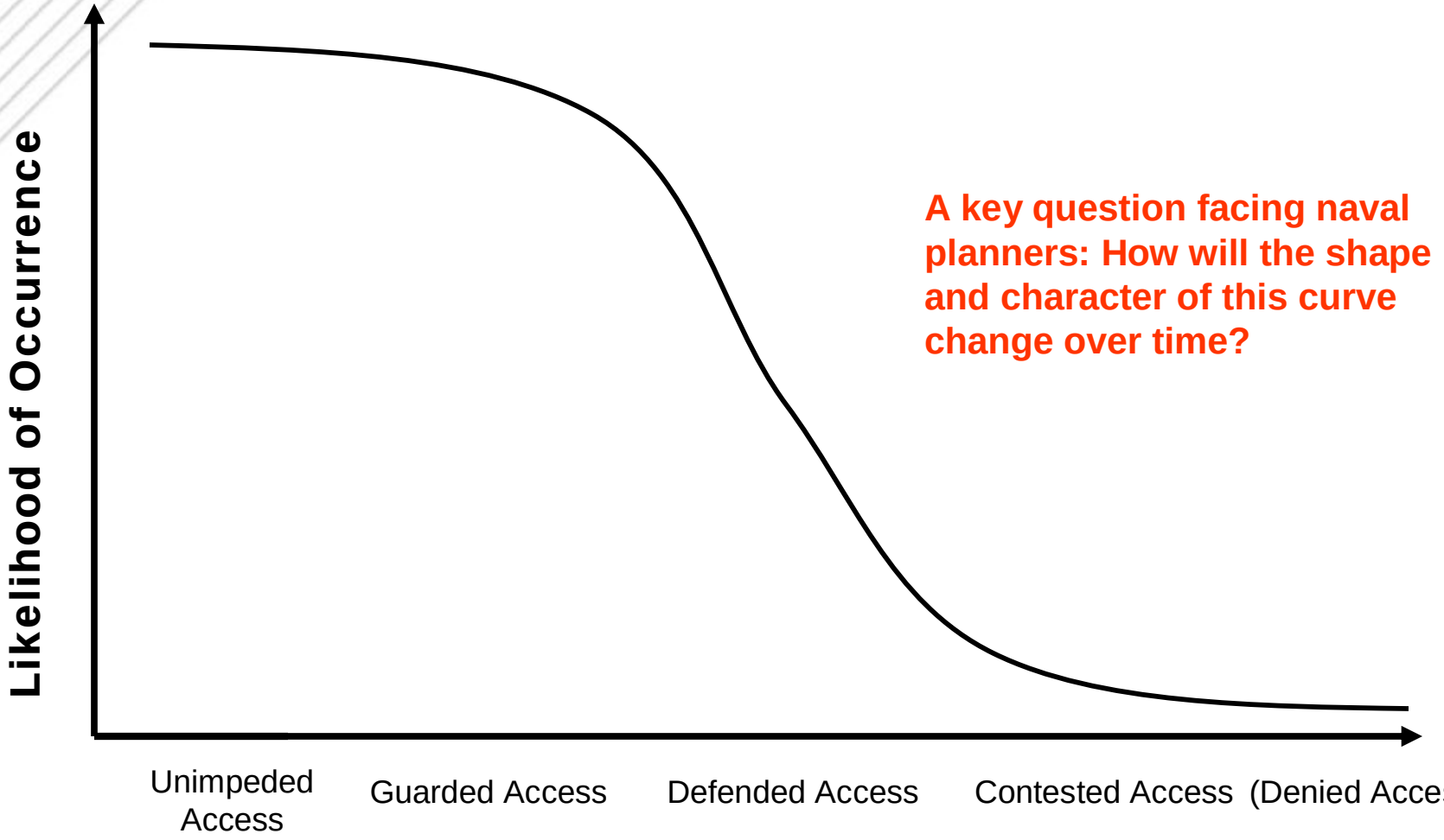
  - *Unimpeded access* (Irregular threats):
    - The enemy has no capability to deny US naval forces freedom of action in littoral waters beyond surprise irregular attacks

  - *Guarded access* (Irregular/Traditional threats):
    - The enemy has a gray-hulled or irregular coast guard whose primary function is to warn of an impending attack by a US naval task force; mines may also be used to guard maritime approaches

These Three Course Variations Will Occur Under Different Racing Conditions, Defined Principally by the Degree of Littoral Maritime Access (2)

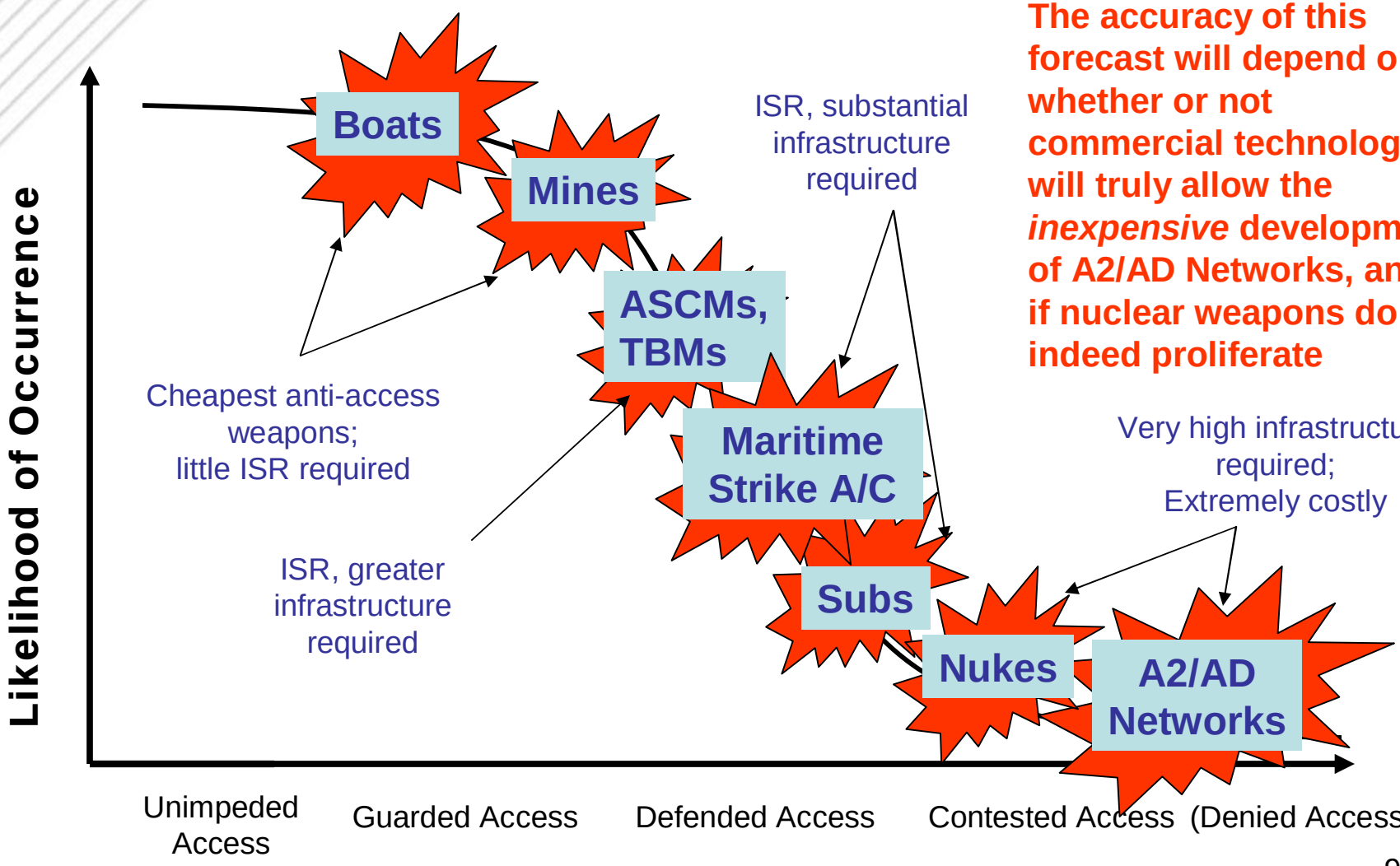
- *Defended access* (Traditional/Catastrophic threats):
  - The enemy can launch solitary or sustained attacks against naval forces using a variety of means, including WMD
- Contested/Denied access (Disruptive/Catastrophic threats)
  - The enemy has an integrated, redundant, and hardened A2/AD network that can deliver sustained counter-network information attacks and other, accurate multi-dimensional guided weapons fires and effects —including WMD—to the limits of its sensor range

This "Access Curve" Depicts The Current State of Global Access Conditions



A key question facing naval planners: How will the shape and character of this curve change over time?

Third Forecast: the Access Curve Also Reflects an Accurate Picture of Prevailing Race Conditions Over the Longer Term



The accuracy of this forecast will depend on whether or not commercial technologies will truly allow the *inexpensive* development of A2/AD Networks, and if nuclear weapons do indeed proliferate

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Finally, the Expected Local Budget Forecast is for "Light Winds"

- The FY 2005 defense budget was very high by historical standards
  - Without the GWOT Defense Supplementals, the budget was 10% above the Garrison Era average (in real terms)
  - With the Supplementals, the budget was higher than either the Vietnam or Reagan Administration peaks
- The FY 2006 budget represents the eighth straight year of real defense growth
  - The longest period of relatively steady increases in defense budgets occurred between 1975-1985, a period of 10 years
- Most defense buildups have been followed by a period of substantial decline in defense spending
  - Between 1986 and 1998, the defense budget was cut 35% in real terms
  - One-third of that reduction occurred before the end of the Garrison Era (Cold War), *driven in large part by deficit reduction efforts*
- The Congressional Budget Office (CBO) forecasts that deficits over the next ten years will amount to some $855 billion
  - Other more realistic forecasts, such as those made by Goldman Sachs (and even alternative forecasts by CBO), project the budget deficits will reach $3-4 trillion over the same period
  - Budget deficits are forecast to get even worse after 2015 due to demographic changes

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The Future DoN Budget Climate Will Thus Challenge Even the Most Clever Naval Force Planner

- A reasonable set of assumptions is that:
  - The DoD topline remains at approximately the FY 2005 level of about $400 billion (constant dollars) over the next 20 years, with the costs of major military operations covered by Supplementals
  - The DoN topline remains at the FY 2005 level of roughly $120 billion a year (constant dollars)
    - DoN procurement averages 25% of the DoN budget (the average share of DoN topline over the past 20 years), or $30 billion a year (constant dollars)
    - Total shipbuilding--including SCN, NSDF, and conversions—will be about 1/3 of the DoN procurement budget (the average share of DoN procurement funding over the past 20 years), or approximately $10 billion a year (constant dollars)

- Many might consider these assumptions to be overly optimistic, especially given the budget pressures of the GWOT, increasing manpower costs, and the deficit. However, this report will consider ***a steady state shipbuilding budget of $10 billion a year, plus/minus 10%,*** to be a suitable planning target for TFBN design planners

- The FY 2005 shipbuilding budget was $12 billion for nine ships (average: $1.33 billion per ship); the FY 2006 budget is approximately $6 billion for four ships (average: $1.5 billion per ship). For planning purposes, a notional “average ship” therefore costs about $1.4 billion, meaning a $10 billion shipbuilding budget supports a notional average annual ship build rate of 7.14 “average ship equivalents” (ASEs)

The Future DoN Budget Climate Will Thus Challenge Even the Most Clever Naval Force Planner (2)

- Assuming an average ship ESL of 30-35 years, the number of ship platforms in the TFBN will fall to 210-225 ASEs over time
  - Building ships that cost greater than one ASE will drive down the number of actual platforms in the TFBN
  - Building more ships that cost less than one ASE will drive up the number
- This discussion suggests how important it is to reverse the escalating costs for TFBN warships:
  - Dropping the cost of an average ship equivalent to $1 billion would allow TFBN planners to purchase 10 ASEs on a steady state planning budget of $10 billion a year, which would result in a TFBN with 300-350 ASEs

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Based on These Forecasts, Naval Planners Must Develop a Flexible Long-Range Racing Strategy Of Enduring Maritime Supremacy That is Prudent, Practical, *and Fiscally Realistic*

Potential Race Conditions

Irregular **Traditional** **Catastrophic** **Disruptive**

Race Goals

Reassure

Dissuade

Deter

Defeat

Fight the GWOT

Prepare for possible nuclear-armed regional competitors

Hedge against a disruptive maritime competition with China

Under variable access conditions and in a period of fiscal austerity

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Changing Battle Force Design Attributes and Battle Force Racing Style

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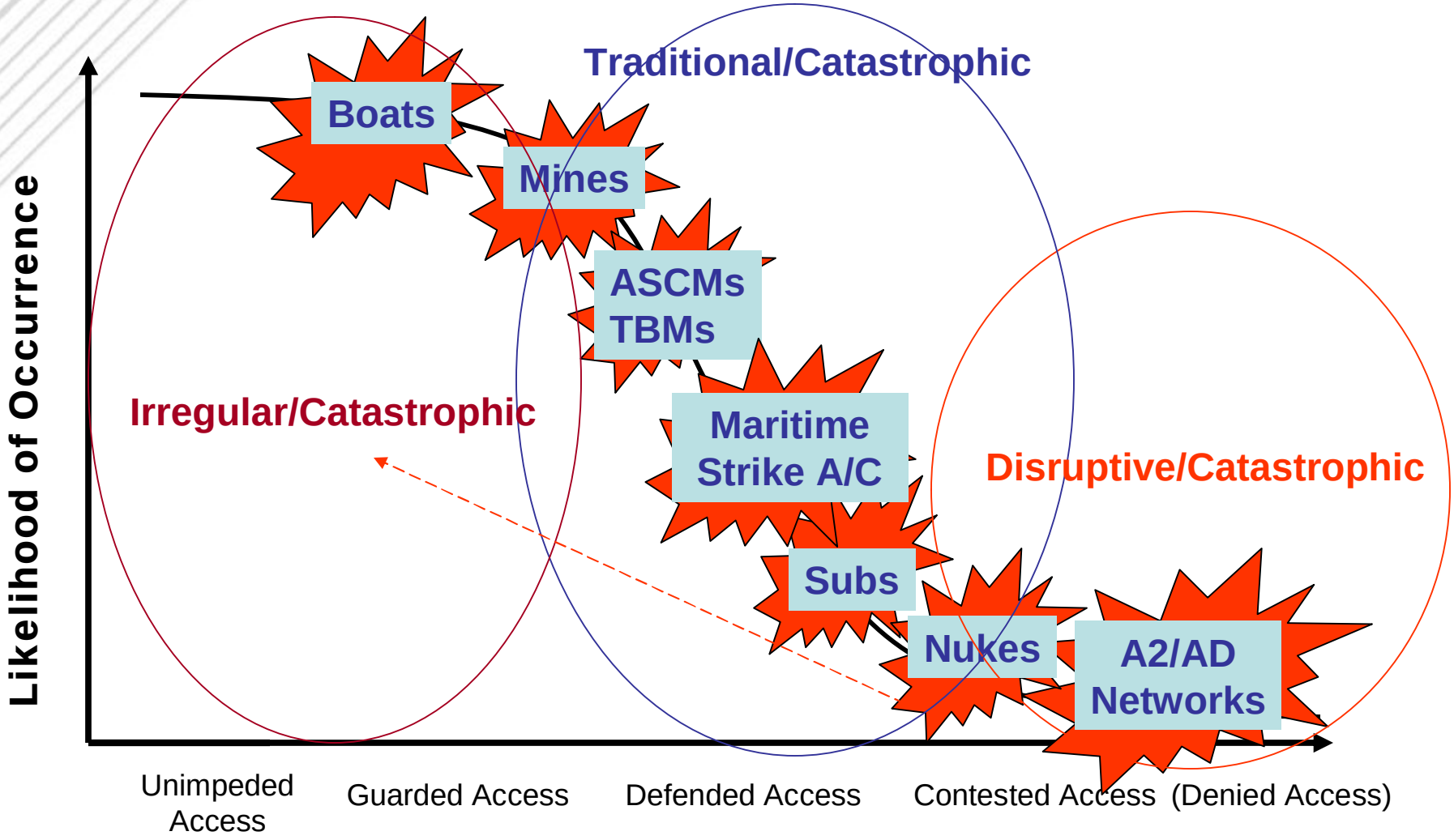
The Three Aforementioned Challengers DoN Racing Strategists Must Plan to Confront are Nominally Associated With Specific Parts of the Access Curve



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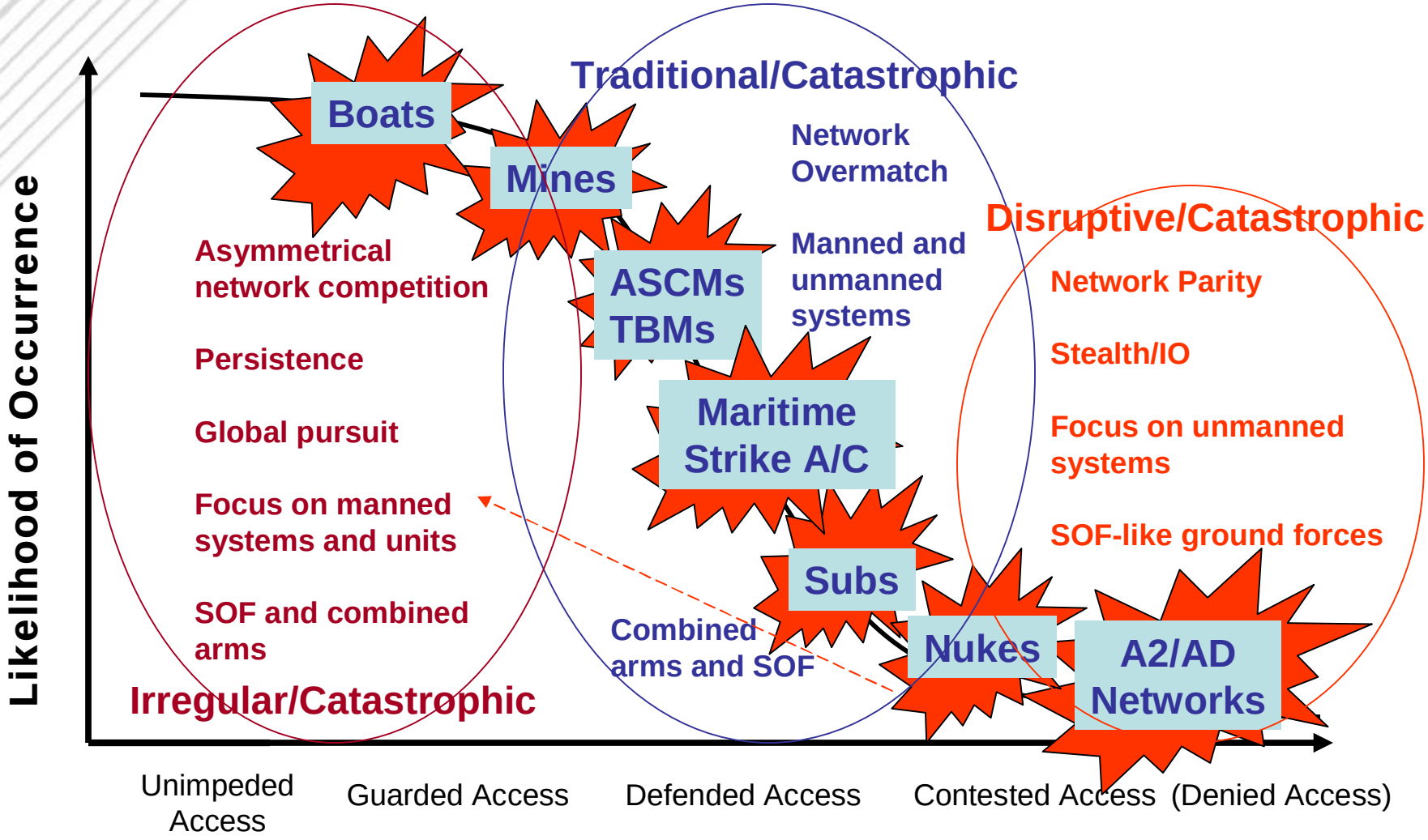
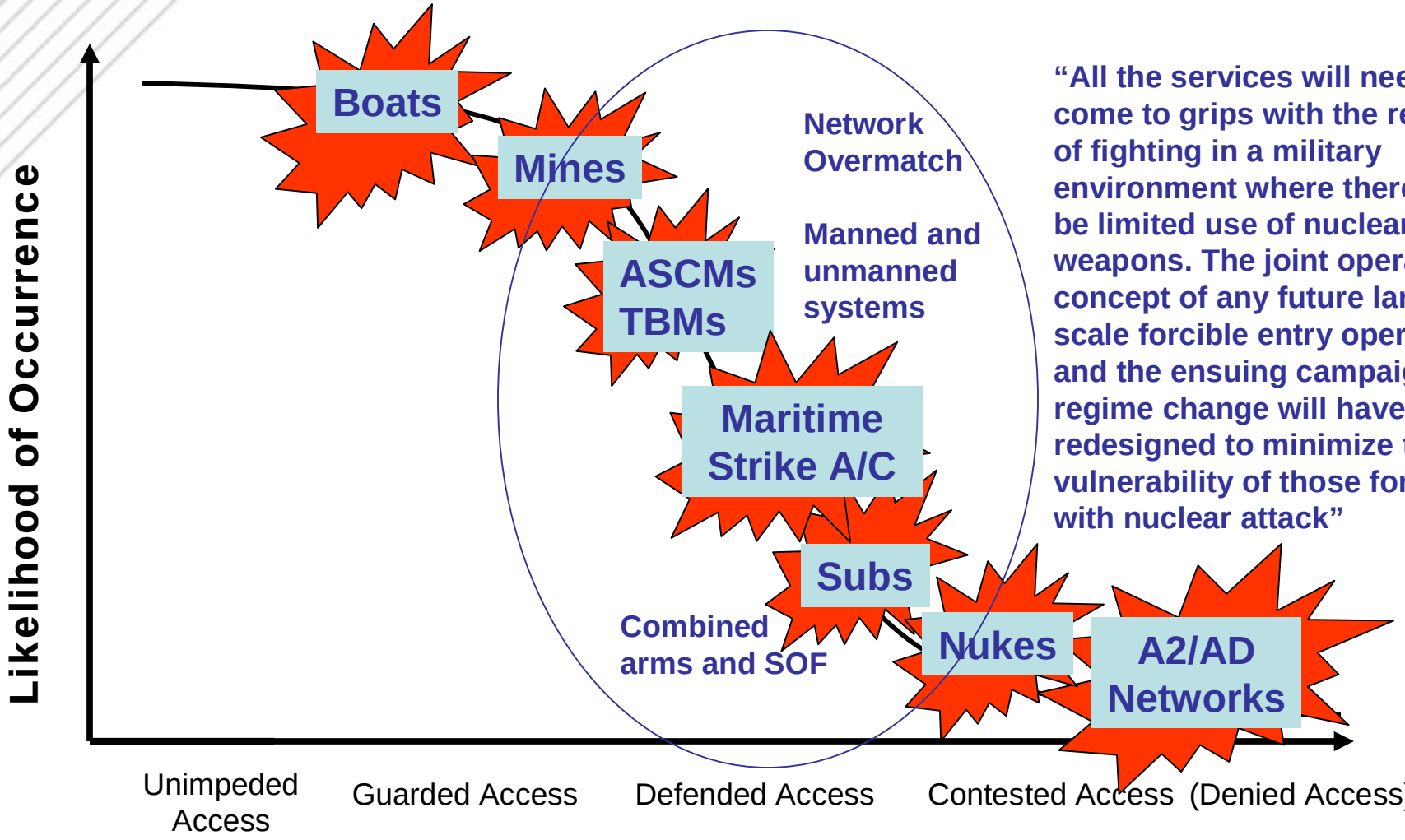
Each of the Challengers Pose Quite Different Challenges For DoN Racing Strategists

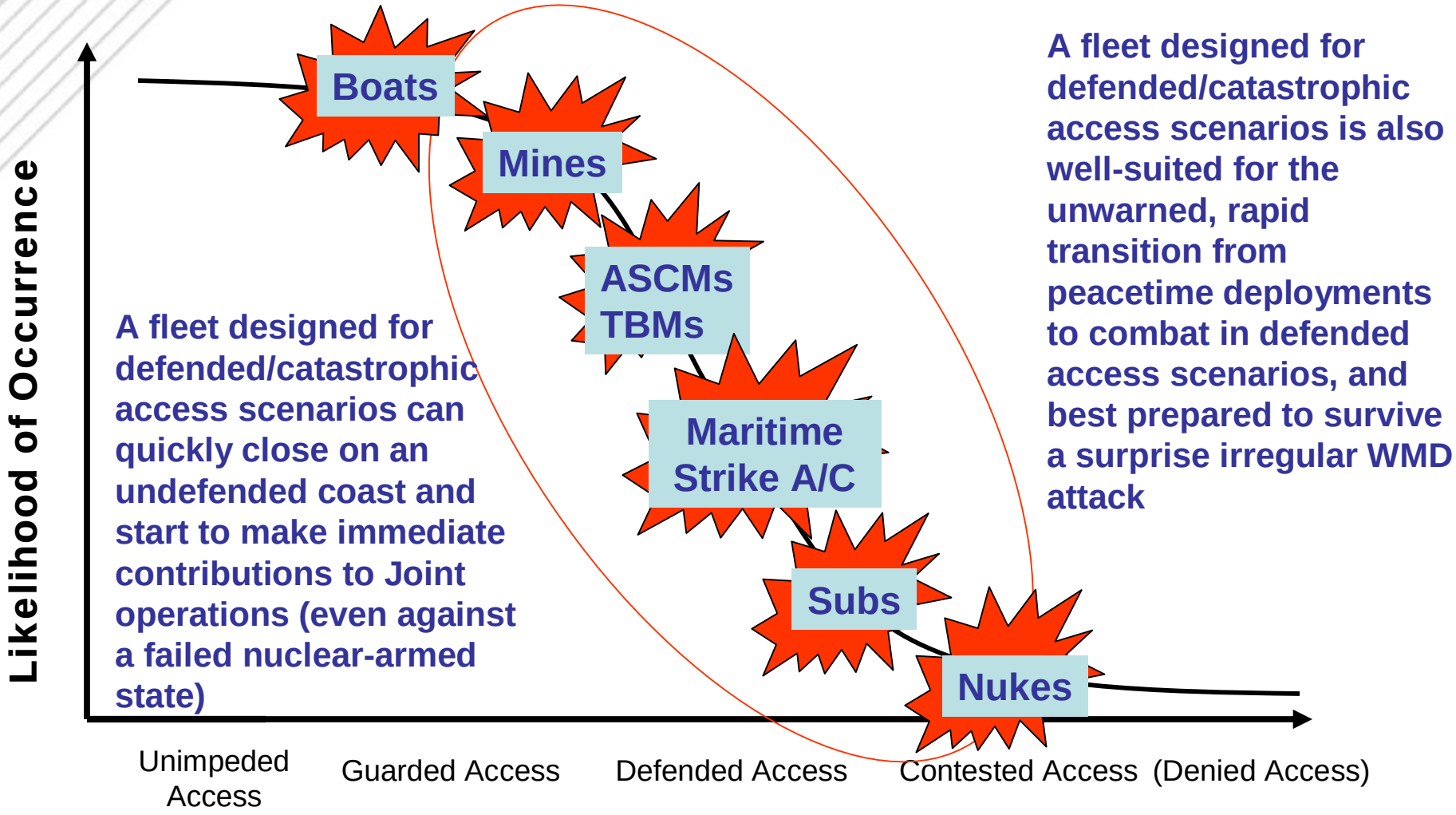


The Three Challenger/Access Combinations Suggest That the Design of the DoN Battle Force Should be Optimized For Beating Traditional/Catastrophic Challengers in Defended Littorals



"All the services will need to come to grips with the realities of fighting in a military environment where there could be limited use of nuclear weapons. The joint operational concept of any future large-scale forcible entry operation and the ensuing campaign of regime change will have to be redesigned to minimize the vulnerability of those forces with nuclear attack"

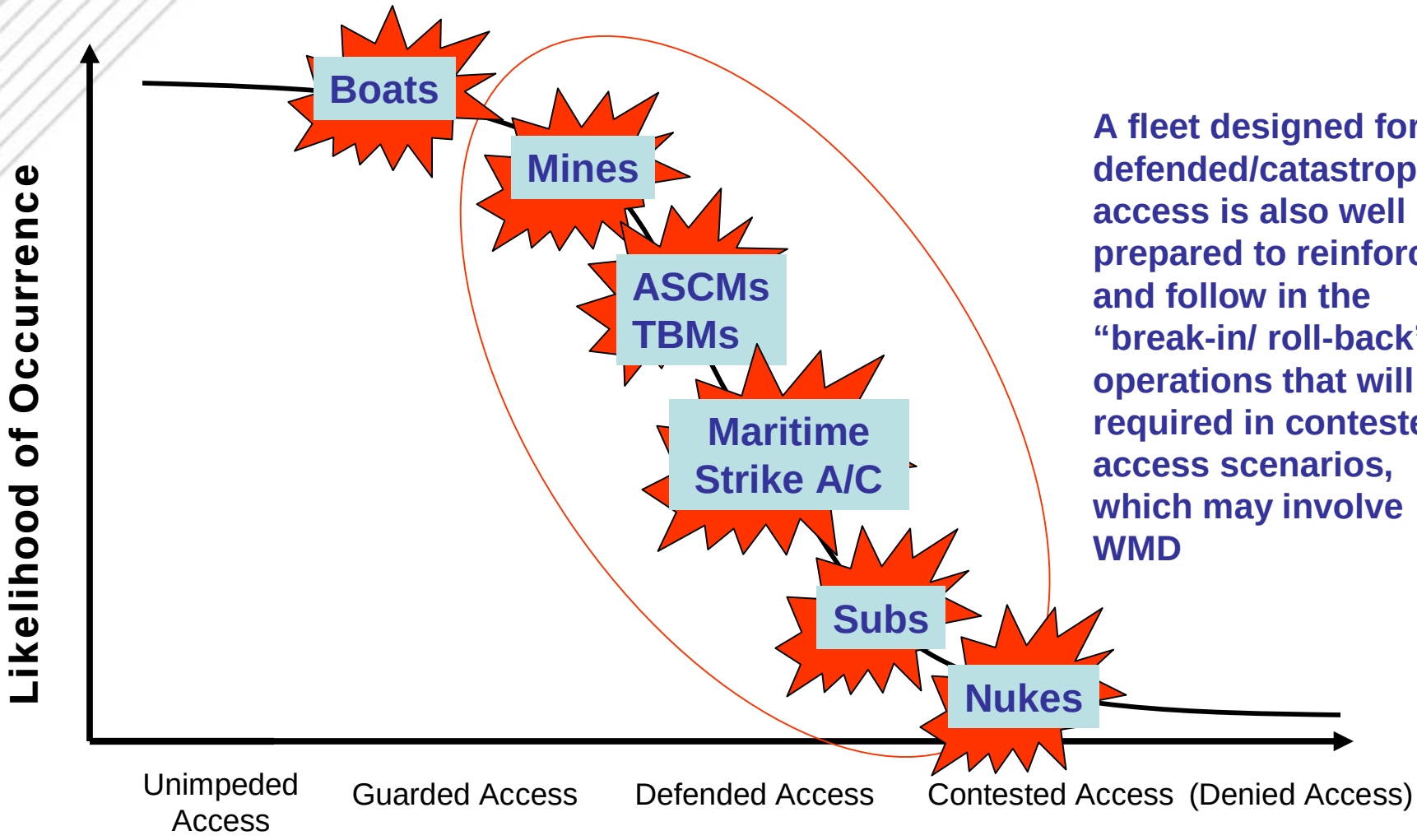
A Battle Force Designed for Defended/Catastrophic Access Scenarios is Immediately Useful in Unimpeded and Guarded Access Scenarios



A fleet designed for defended/catastrophic access scenarios can quickly close on an undefended coast and start to make immediate contributions to Joint operations (even against a failed nuclear-armed state)

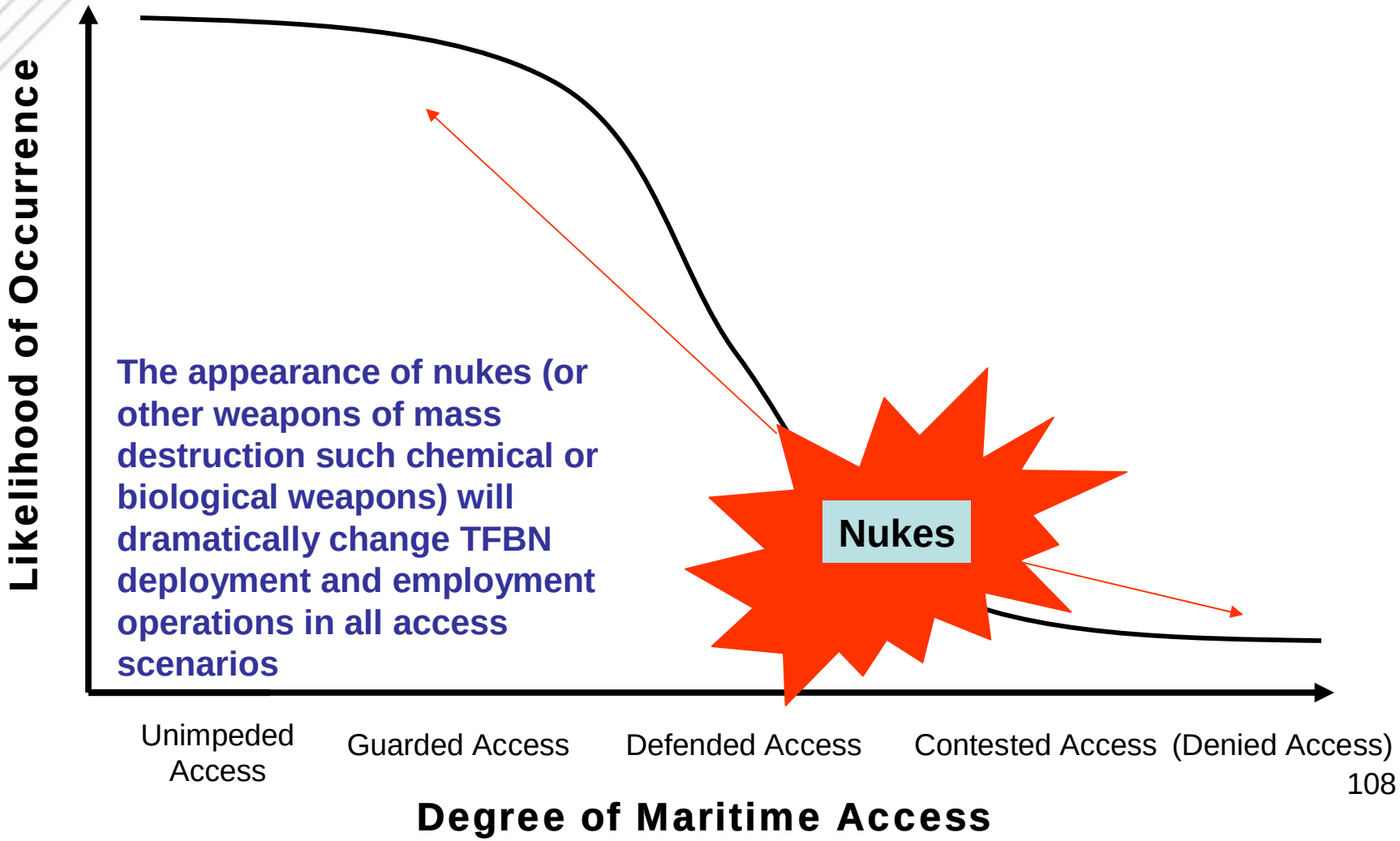
A fleet designed for defended/catastrophic access scenarios is also well-suited for the unwarned, rapid transition from peacetime deployments to combat in defended access scenarios, and best prepared to survive a surprise irregular WMD attack

A Battle Force Designed for Defended/Catastrophic Access Scenarios Can Move Into a Contested Littoral Once an Adversary's A2/AD Network is Rolled Back

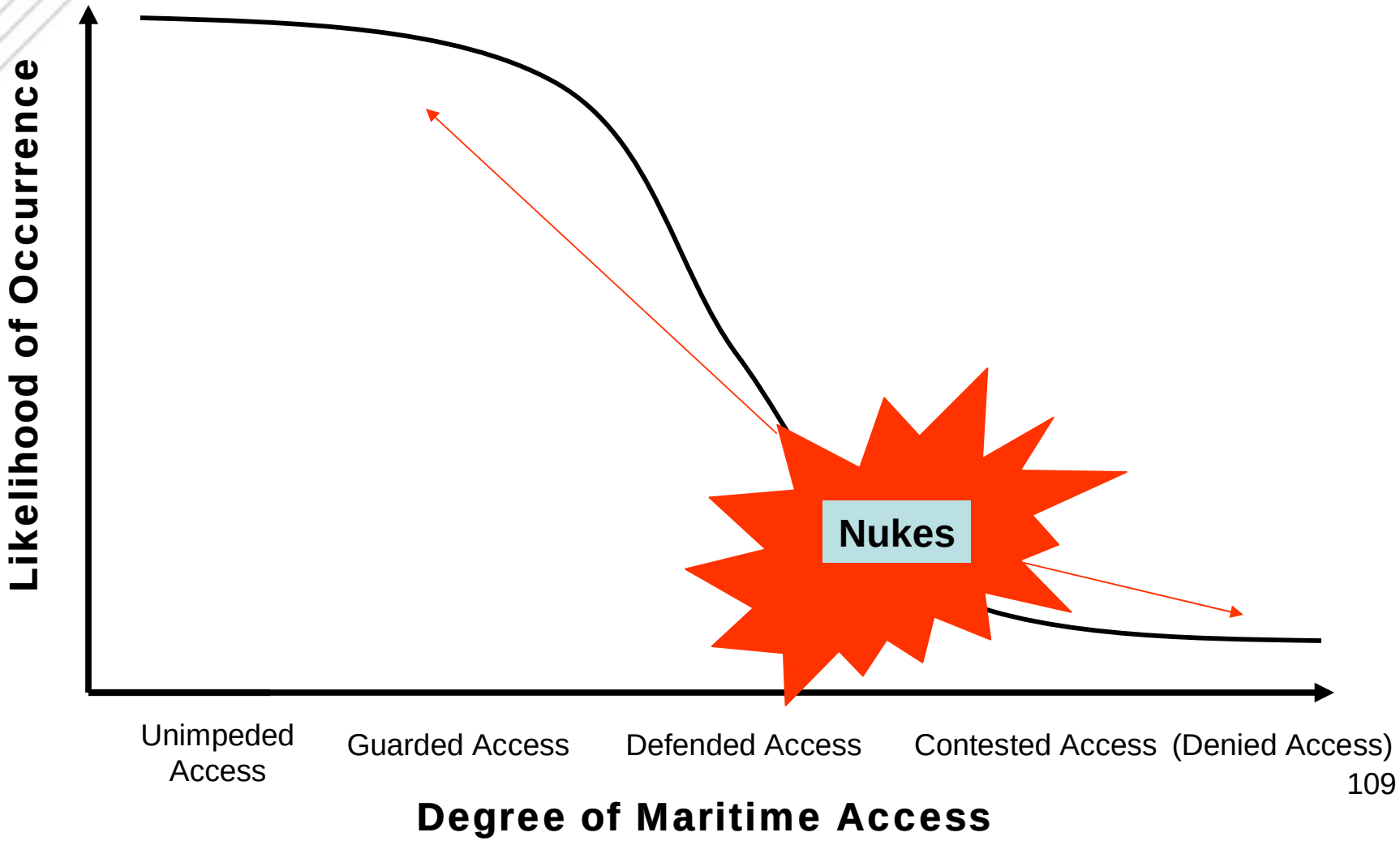


A fleet designed for defended/catastrophic access is also well prepared to reinforce and follow in the "break-in/ roll-back" operations that will be required in contested access scenarios, which may involve WMD

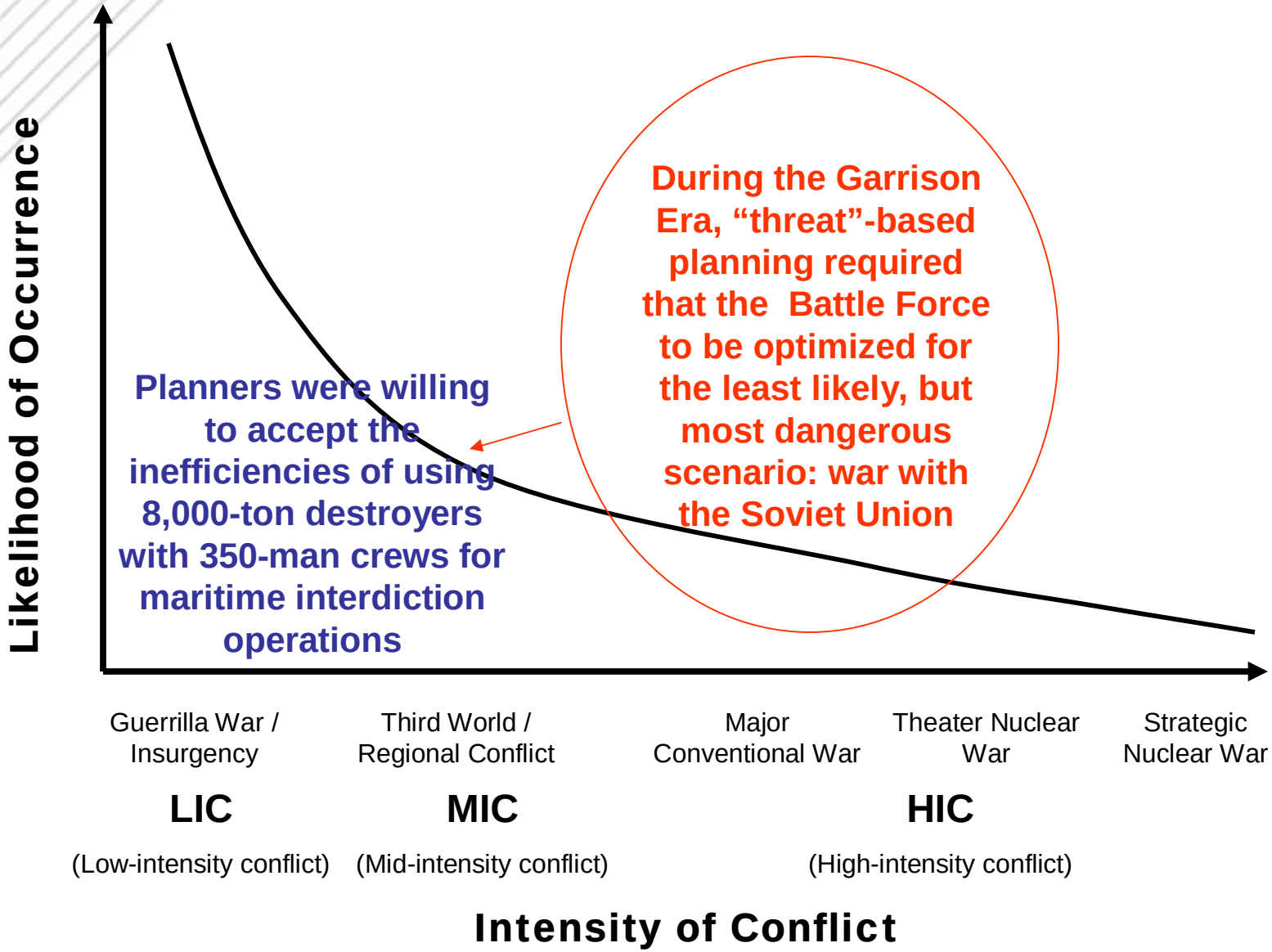
Basic Assumption: the Battle Force Must Be Capable of Operating Against a Nuclear-Armed Regional or Transnational Opponent



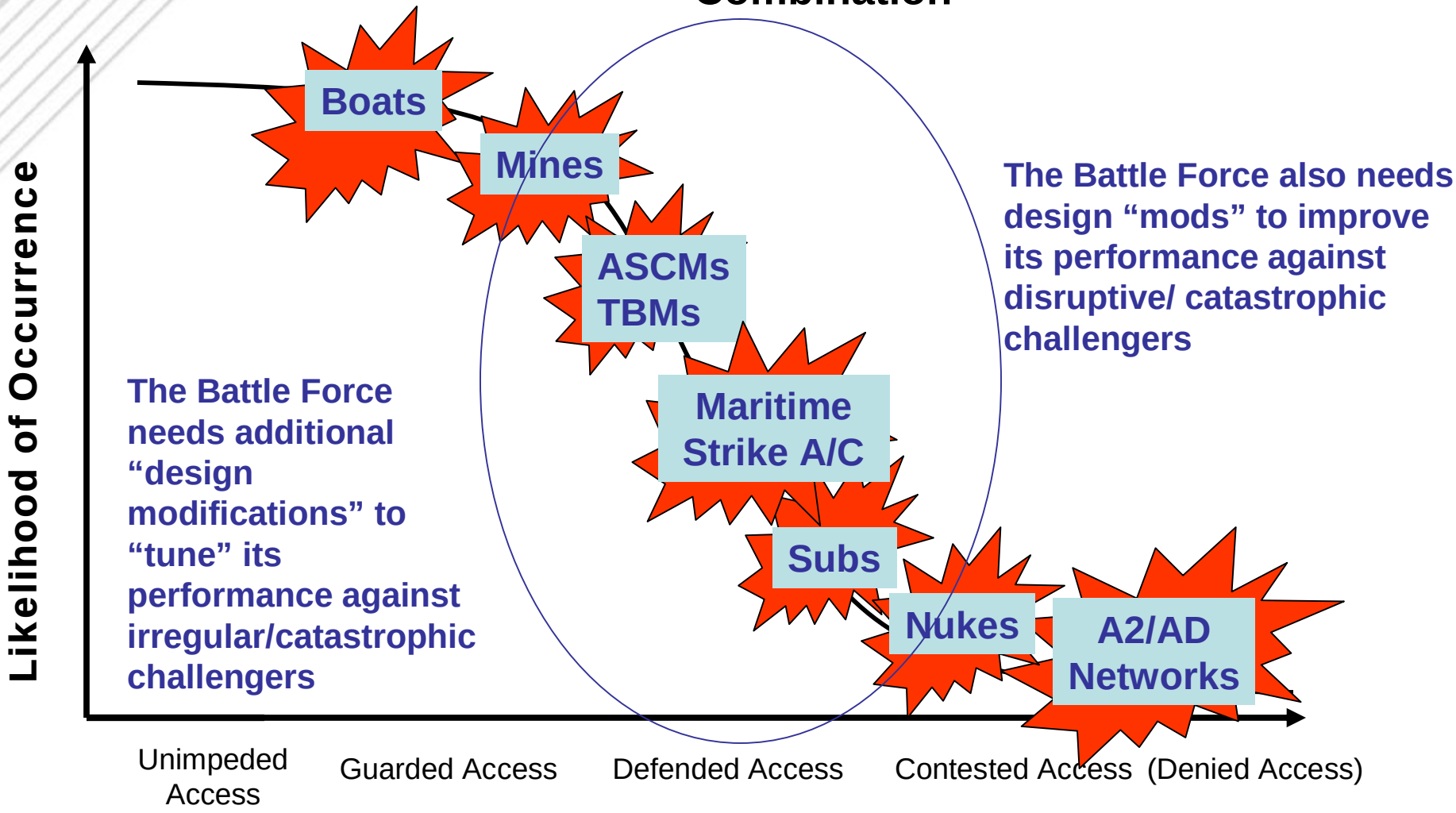
Assumption: Nuclear-Armed Regional or Transnational Opponents Also Call For the Maintenance of a Strategic Deterrent Force



Optimizing Battle Force Design Attributes Is a Common Part of a Battle Force Era's Racing Strategy



However, for a Strategy of Enduring Maritime Supremacy, DoN Strategists Must be Wary About Accepting Inefficiencies/Deficiencies For Any Challenger/Access Combination



Following This Line of Thinking, the 21st Century Naval Battle Force Should Have a Basic Design With Three Modifications—In Essence, Four Component Fleets

- **A "Sea as Base" Power Projection/Regional Deterrence Fleet, focused on:**
  - Overcoming traditional challenges under unimpeded, guarded, and defended access conditions, and traditional/catastrophic challenges posed by nuclear-armed regional adversaries
- **A Global Patrol/GWOT/Homeland Defense Fleet, focused on:**
  - Confronting irregular and irregular/catastrophic (nuclear/WMD terrorism) challenges, primarily in unimpeded and guarded access scenarios
- **A Contested/Denied Access Fleet, focused on:**
  - Prevailing over disruptive access challenges such as high-end, asymmetrical A2/AD networks, and that may employ tactical nuclear weapons or other WMD
- **And an additional Strategic Deterrent/Dissuasion Fleet, which would:**
  - Deter state-sponsored WMD attacks against the US homeland and allied territory, and against Joint and combined forces overseas; and
  - Dissuade would-be adversaries from mounting an open-ocean or disruptive naval challenge

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The General Requirements for These Four Component "Fleets" Differ

- **The "Sea as Base" Power Projection/Regional Deterrence Fleet requires:**
  - High-volume strike platforms with capable multi-dimensional defense capabilities; heavy maneuver support platforms; and Joint logistics platforms—all capable of operating within Joint Battle Networks under nuclear threat

- **The Global Patrol/GWOT/Homeland Defense Fleet requires:**
  - Large numbers of cheap, lightly manned combatants, backed up by a global maritime surveillance network, capable of mounting a distributed close blockade of the GWOT theater littorals, and cost-effective global patrol and maritime interdiction operations; and
  - Persistent overt and covert strike, SOF, and light maneuver support platforms
  - As this fleet forms both an offensive and defensive component of ***the National Fleet*** (to be explained), it should complement and be compatible with the Coast Guard Deepwater Fleet, another defensive component of the National Fleet

- **The Contested/Denied Access Fleet requires:**
  - Stealthy platforms, unmanned systems, and standoff weapons all capable of extended-range operations in the Guided Warfare Weapons Regime

- **The Strategic Deterrent/Dissuasion Fleet requires:**
  - Powerful fleet-in-being of SSNs and SSBNs, as well as:
    - A Battle Force characterized by balance and over-matching scale
    - A *robustly funded naval R&D infrastructure*
    - A *robust naval shipbuilding infrastructure*

However, Even in a Unconstrained Budget Environment, DoN Strategists/Planners Would Not Likely Opt to Build Four Stand-Alone Component Fleets

- **"Sea as Base" Power Projection/ Regional Deterrence Fleet**
  - High-volume strike platforms with capable multi-dimensional defense capabilities; heavy maneuver support platforms; and joint logistics platforms capable of operating in a nuclear environment
- **Global Patrol/GWOT/Homeland Defense Fleet**
  - Large numbers of cheap, lightly manned combatants capable of cost-effective global patrol functions
  - Persistent and covert strike, SOF, and light maneuver support platforms
  - This fleet is the offensive component of the National Fleet; it should be compatible with the Coast Guard Deepwater Fleet
- **Contested/Denied Access Fleet**
  - Stealthy platforms; unmanned systems; standoff weapons
  - A healthy experimentation program
- **Strategic Deterrent/Dissuasion Fleet**
  - Powerful fleet-in-being of SSNs and SSBNs as well as:
    - A battle fleet characterized by balance and scale
    - A robust naval shipbuilding infrastructure, including design teams
    - An adequately funded naval R&D infrastructure

Instead, the DoN would be better served by building a flexible and modular naval "racer"—a platform architecture that allows the Battle Force to reconfigure itself to effectively cover the requirements for all four of its component fleet missions, *and* to quickly adapt to changing race competitors and access conditions

The most attractive platforms/capabilities will be those with modular payloads that allow them to perform important functions and meet requirements for more than one component fleet

However, some missions will continue to call for unique, special-purpose platforms, and other platforms may not be completely fungible across all four fleets

And in Any Event, in This Budget Climate, Such An Approach is Out of the Question

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  - High-volume strike platforms with capable multi-dimensional defense capabilities; heavy maneuver support platforms; and joint logistics platforms capable of operating in a nuclear environment
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The most attractive platforms/capabilities will be those with modular payloads that allow them to perform important functions and meet requirements for more than one component fleet

However, some missions will continue to call for unique, special-purpose platforms, and other platforms may not be completely fungible across all four fleets

The key question, then, is: How to design a "modular" DoN Battle Force on a target budget of approximately $10 billion a year?

First, by factoring in potential Joint, USG, and allied contributions

This Discussion Suggests That DoN Planners Need to Begin to Change the Battle Force's Basic Racing Design From One Based on Platforms to One Based on Networks

- A networked-based Battle Force would require far different design characteristics than a Battle Force built around a particular type of platform. These design characteristics can be described as:
  - ***Get connected, Jointly:*** create overlapping sensor grids, command and control grids, engagement grids, and maneuver units—connected by numerous man-to-machine and machine-to-machine links and interfaces—to create ***Naval Battle Networks***, themselves components of larger ***Joint Multi-dimensional Battle Networks***, to improve collaborative planning, shared awareness and speed of command under all access and threat conditions (design principle: ***substitute information for some numbers of platforms***)
  - ***Get modular:*** emphasize modular construction, modular weapon systems, modular systems, modular open system architectures; and modular maneuver units. Emphasize platforms that carry multiple payloads, so that they can contribute to a variety of fleet missions (design principle: ***substitute multi-purpose platforms for multi-mission and single-mission platforms***)
  - ***Get off-board:*** emphasize off-board systems in modular payloads to expand the sensing and engagement envelopes around each individual network platform, unit, or "node," and to extend the total sensor volume and engagement range of Naval Battle Networks, under all access and threat conditions (design principle ***substitute scalable off-board combat systems for combat systems that are closely coupled to a specific platform***)
  - ***Get unmanned:*** Reduce crew and unit size whenever possible, and pursue unmanned systems in the air, on and under the ocean's surface, and on the ground, especially for well-defended or contested access race conditions (design principle: ***substitute technology for people, when and where appropriate***)

These New Design Attributes Point the Way Toward a New Naval *Network*—As Opposed to Naval *Platform*—Architecture

- In this new naval network architecture, platforms will remain important, but they will no longer represent the central organizing construct of the Battle Force
- In other words, in the Joint Expeditionary Era, adaptable and scalable ***Naval Battle Networks*** will be the "capital ships" of the Battle Force
- Counting ships in the Total Ship Battle Force will thus be a poor indicator of the power of the DoN Battle Force. Instead, there will need to be different, more accurate ways to measure to maximum scalable combat power of the ***Total Force Battle Network—or TFBN***
  - For example, instead of a TSBF with 12 carriers, 84 surface combatants, and 58 submarines, the future TFBN will be described in terms of a ***12,000 aim-point a day-10,000 VLS cell-x number of modular payloads network***
  - This means that the operating dimension in which a platform or node operates is immaterial; aircraft like the Broad Area Maritime Surveillance System (BAMS), the Multi-mission Maritime Aircraft (MMA) and the Airborne Common Sensor (ACS) are as important in certain instances as a ship
- The modular nature of the future TFBN will allow naval planners and commanders to rapidly assemble, scale, and tailor Naval Battle Networks to meet existing or emerging requirements, challengers, and access conditions***—but only if the Battle Force is trained to do so***
  - This suggests a further TFBN design (and training) attribute

Get Quick

"The entire operational and tactical…method hinged upon… ***rapid,*** *concise assessment of situations,…****quick*** *decisions and* ***quick*** *execution, on the principle: each minute ahead of the enemy is an advantage" (emphasis in the original)*

General Gunther Blumentritt, German Army

- Properly constructed, one should expect Battle Networks to enjoy better force sensing, better collaborative planning, better shared battlespace awareness, and a better understanding of the commander's intent than a non-networked force
  - This advantage is manifested at the force-wide level; because of the differences in the cognitive processing between Battle Network personnel, there will always be different interpretations of data throughout all levels of the force

- The goal of better force sensing, better collaborative planning, better shared battlespace awareness, and a better understanding of the commander's intent is higher Battle Force "speed of command," which should, in relation to a non-networked force, give the Battle Force:
  - A relative advantage in its "ability to pick and choose engagements opportunities;"
  - Better "transient performance in operations and tactical encounters," --"changing from one direction, maneuver, speed, or altitude" faster than an enemy); and
  - An ability to operate at a "faster tempo or rhythm"

- Said another way, higher Battle Force speeds of command should allow Naval Battle Networks to gain informational, temporal, and positional advantages over a non-networked enemy (design principle: ***substitute network quickness for some numbers of platforms***)

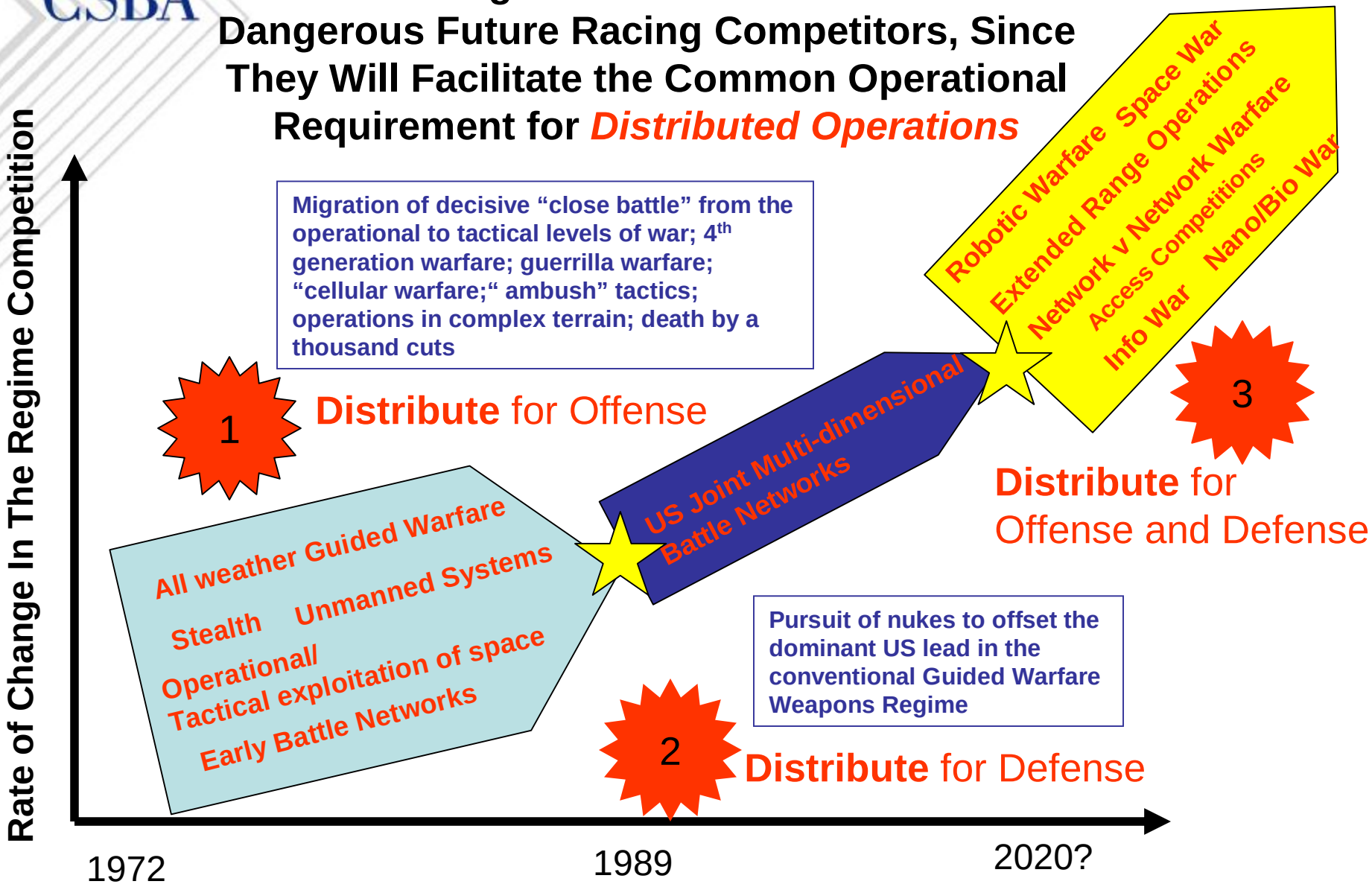
However, Achieving Quickness Depends Less On the Technical Aspects of Force-wide Connectivity and Platform Speed, and More On Having a "Scouting" Advantage; Confident and Able Commanders; a Well-Trained Force; and an Emphasis on Decentralized Execution

- Persistent, quick-scanning, distributed sensors are more important than sensor platform speed
  - Persistent sensors facilitate better scouting, and more rapid perceptions of change
- Understanding is more important than the rapidity of the decision cycle
  - Solving the wrong problem more quickly is not helpful
- Quick assessments depend as much on the skill of the commanders at all levels and their willingness to act on imperfect or incomplete information as it does on the level of force shared awareness or collaborative planning
  - A willingness of commanders to quickly act on unfolding events is more often more important than quickly executing what was collaboratively planned
- The force's (and a platform's) ability to dump and gain energy (acceleration and deceleration) is more important than platform speed
  - In other words, network "agility" is more important than platform speed
- An ability to operate at a faster rhythm or tempo than an adversary is more important than platform speed

Improving the TFBN's Quickness Will Require Navy and Marine Combat Capabilities to be Better Integrated in the Future Than They Were in the Latter Part of the Garrison Era and Early Part of the Joint Expeditionary Era

- ***Get integrated**:* In the Joint Expeditionary Era—an era of uncertain access marked by a long competition against a hostile, transnational insurgency and other emerging challenges—there will be an enduring requirement to rapidly assemble Naval Battle Networks capable of both **fire *and* maneuver** in support of Joint power projection operations or combined arms Joint Forcible Entry Operations (JFEOs)—possibly against regional adversaries armed with nuclear weapons
  - The effectiveness of DoN combined arms Naval Battle Networks will be immeasurably greater if the Navy and Marines are once again able to forge a common Departmental operational vision and to better integrate their capabilities
  - This will require that the Navy truly embrace a return to DoN sea-based *power projection operations*, to include both strike *and* combined arms maneuver from the sea, and develop their service requirements within the framework of an Integrated DoN Total Force Battle Network
  - This will require that the Marines place the same priority on their FMF role in the Joint Expeditionary Era as they do their separate service status, and develop their service requirements within the framework of an Integrated DoN Total Force Battle Network (design principle: ***incompatible service operational visions will degrade the overall performance of the DoN TFBN***)
  - Observation: the end of the first Expeditionary Era saw the highest level of DoN integration since the US's entry into the global naval competition; it is likely to offer important clues and lessons on how to best integrate DoN capabilities

Importantly, Naval Battle Networks Will be Effective Against All Three of the Most Dangerous Future Racing Competitors, Since They Will Facilitate the Common Operational Requirement for *Distributed Operations*



Distributed, Integrated Battle Network Operations are a Straight-Line Extension of Battle Force Operational Preferences Evident Since the Continental/Frigate Era

- ***Get distributed****:* assemble smaller "combined arms" naval task groups, distribute them globally, connect them by networked grids, and employ them as scalable Naval Battle Networks appropriate to the fleet mission, threat and access conditions (design principle: ***substitute distributed scalability for mass***)

- The move toward larger numbers of smaller, linked naval task groups continues a trend observable since the Continental/Frigate Era:
  - Continental/Frigate Era: up to eight-ten distributed forward fleet "stations"
  - Expeditionary/Battleship Era: one concentrated battle line (an anomaly)
  - Expeditionary/Carrier Era: four to five distributed strike groups
  - Garrison/Carrier Era: 12 distributed strike groups
  - Joint Expeditionary/Carrier Era: 19 distributed strike groups
  - Joint Expeditionary/Distributed Networked Battle Fleet Era: 30+ distributed strike groups

"I believe in the power of a dispersed force that is completely and totally integrated and has the right kind of information at the human being level so that it can take on the challenges. That's the most important thing.

Admiral Vern Clark, CNO

While Distributed Battle Force Operations are Not Unique to the Joint Expeditionary Era, They are Now a Fundamental Requirement For Both TFBN Offense and Defense

- For offensive operations in the GWOT and against all irregular naval challengers:

  "Guerrilla war, too, inverts one of the main principles of orthodox war, the principle of concentration--and on both sides. Dispersion is an essential condition of survival and success on the guerrilla side, which must never present a target and thus can operate only in minute particles, though these may momentarily coagulate like globules of quicksilver to overwhelm some weakly guarded objective… Dispersion is also a necessity on the side opposed to the guerrillas since there is no value in a narrow concentration of force against such elusive forces, nimble as mosquitoes."

  Liddell Hart

- For operations against potential nuclear-armed regional adversaries:

  " For guerrillas the principle of concentration has to be replaced by that of "fluidity of force," which will also have to be adopted and modified by regular forces when operating under a liability of bombardment by nuclear weapons."

  Liddell Hart

Distributed Operations Will Also be a Fundamental Requirement For Future Symmetrical and Asymmetrical Network v Network Warfare

- Distributed operations will be especially necessary during future confrontations against networked enemies armed with as powerful sensors and weapons as our own:

"*Such is concentration reasonably understood, not huddled together like a drove of sheep, but distributed with a common purpose, and linked together by the effectual energy of a single will.*"

Alfred Thayer Mahan

"When once the mass is formed, concealment and flexibility are at an end. The less we are committed to any particular mass, and the less we indicate what and where our mass is to be, the more formidable our concentration. To concentration, therefore, the idea of a division is as essential as the idea of connection."

Sir Julian Corbett

"We have to be able to rapidly reposition and maneuver in a distributed force concept. That will make it very difficult for an asymmetrical enemy to get the information needed to strike us or to be able to afford the technology to counter us…It is absolutely foolish for us to put our assets together in large force sets that make it easy for an enemy to take us on."

Admiral Vern Clark, CNO

CSBA

Altering Course and Speed:

Building an Affordable Naval Platform Architecture for the *Total Force Battle Network* in the Joint Expeditionary Era

"You don't get credit for predicting rain. You only get credit for building an Ark."

CSBA

A Transition Strategy Toward a *Distributed, Integrated, Networked Battle Force*

- Although the TFBN currently enjoys a dominant margin of naval supremacy, given the previous forecasts of future race challengers and conditions, it must start to transition toward a Battle Network more capable of meeting future challenges

- Given expected budget forecasts, this report is guided by the following TFBN transition strategy:
  - Plan to a fiscally prudent steady state shipbuilding budget target of $10 billion a year (+/- 10%)
    - Should additional money be forthcoming in any given year, the basic plan should have a prioritized list of desired TFBN "accessories" or "add-ons"
  - Maximize current TFBN capabilities and minimize non-recurring engineering costs on new platforms by maintaining and pursuing hulls in service, in production, or near production that can meet near-to-mid-term GWOT requirements and that are capable of operating in defended access scenarios against nuclear-armed regional adversaries
  - Identify and retain or build *large numbers* of common hulls that have a large amount of internal reconfigurable volume, or that can carry a variety of modular payloads, or that can be easily modified or adapted to new missions, over time
  - Minimize average ship production costs *for warships that cost more than $1.4 billion*, or one average ship equivalent, by consolidating production in a single yard, pursuing learning curve efficiencies associated with stable class production runs, and requesting efficient multi-year procurement contracts whenever possible
  - Minimize average ship production costs *for warships and fleet auxiliaries that cost less than one average ship equivalent* by emphasizing competition, shifting production to smaller Tier II yards, building large, efficient production runs, and enforcing ruthless cost control

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A Transition Strategy Toward a *Distributed, Integrated, Networked Battle Force* (2)

  - Pursue increased DoN integration of Navy and Marine warfighting capabilities and emphasize common systems whenever possible, in order to get increased operational effectiveness and decreased DoN-wide operations and support (O&S) costs
  - Focus research and development (R&D) efforts on meeting future disruptive maritime challenges, with a priority on defeating heterogeneous A2/AD networks composed of both manned and unmanned long-range systems, and possibly WMD

- Prioritization for TFBN platform architectures and building plans will be on:
  - GWOT platforms
  - Systems that can contribute to a combined arms Joint Forcible Entry Operation against a nuclear-armed regional adversary
  - R&D to hedge against a future disruptive maritime competition and future disruptive challengers
  - Additional platforms necessary to respond to two, simultaneous or near-simultaneous major combat operations against traditional adversaries

- In other words, transition risk will be reflected primarily in the stressing but low probability traditional threat that has been the focus of US defense planning since 1993

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A Word on Crew Rotation ("Sea Swap")

- Future naval commanders will aggregate and assemble Naval Battle Networks using a mixture of platforms/ capabilities that are either:
  - *Based* at permanent or forward operating bases overseas (Forward-Based Network Battle Forces, of FBNBFs);
  - On *rotational forward deployments* (Rotationally-Deployed Network Battle Forces, or RDNBFs); or
  - *Surged* from the United States during crises or contingencies (Battle Network Surge forces, or BNSFs)

- Because of the distances involved, especially to the central GWOT theater, Battle Network platforms on rotational forward deployments from the US can spend up to half their deployed time transiting to and from their patrol areas
  - For example, the sailing distance from Norfolk to the Arabian Gulf is approximately 8,300 miles; the distance from San Diego is 3,000 miles more

- As a result, the Navy has begun to experiment with *crew rotations* for RDBNFs to eliminate the time spent in transit and to maximize the amount of time on-station for Battle Network platforms and their crews
  - The idea of crew rotations to increase ship availability for rotational deployments is not new; since the 1960s, the SSBN force has assigned Blue and Gold crews to each ballistic missile submarine in order to achieve a 66-70% force availability rate for deployment

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A Word on Crew Rotation ("Sea Swap") (2)

- However, in 2001/02, Admiral Clark, the CNO, directed that naval planners begin to experiment with conducting crew rotations on large complex surface combatants to determine if the concept of crew "Sea Swaps" could be expanded to the surface combatant fleet
  - Prior to this, Sea Swaps for surface ships had been limited to small ships such as mine warfare vessels or small patrol combatants

- While the results of experiments to date have been encouraging, it appears to be far too premature to make Battle Network platform architecture decisions based on them. Specifically, the ***long-term*** impact of widespread crew rotations on overall Battle Network capabilities is uncertain. For example:
  - What are the long-term effects on the material condition of ships that are kept on station for longer periods of time? In this budget climate, if crew rotations wear ships out faster and help to create a future "building deficit," its adoption will cause more problems that it solves
  - What will be the long-term impact of crew rotations on crew readiness and retention? If the scheme decreases retention or increases force-wide training requirements, it may not be worthwhile
  - Can Sea Swaps work in large classes with many different combat systems configurations? For example, there are numerous baseline configurations in the 84-ship AEGIS/VLS fleet; how would a sea swap work in this case?
  - And finally, are plans to expand the concept to entire rotationally deployed task groups, such as an Expeditionary Strike Force, possible or advisable?

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A Word on Crew Rotation ("Sea Swap") (3)

- Until these questions are fully answered, Sea Swap will remain a worthwhile experimental program
- In any event, Sea Swap is focused primarily on one thing: increasing the on-station time of RDBNFs. It does not directly lessen TFBN warfighting requirements, although:
  - If the concept results in a far greater number of TFBN assets being able to respond to an emerging crisis faster, it *may* cause an indirect decrease in overall TFBN requirements
    - The idea of substituting speed of response for platforms is an attractive notion, but requires further analysis and operational experimentation
- As a result, the following naval network platform architecture will assume single platform/ single crew combinations, except as noted

A Word on "Large" Versus "Small" Platforms

- While the ongoing debates over the roles of large and small platforms in the future TFBN architecture are quite healthy, there is no clear reason to give preference to either large or small platforms in the overall TFBN design—regardless of what is said by the passionate advocates on both sides of the debate

- This point was fully recognized during the intra-Air Force debates that raged throughout the 1970s and 1980s over the final "high-low" mix of larger, more expensive F-15, and smaller, cheaper F-16 air superiority fighters:

  "All of this is to say that "quality vs. quantity" is a misleading characterization of the US fighter modernization conundrum. The real issue is how much "quality," across what performance spectrum, in what force mix, numerical strength, and sustainability, do we need to give us our desired mission effectiveness for the most plausible scenarios at a cost we can afford."

  Benjamin Lambeth

- Lambeth's words form the guiding thought that animates the following discussion:

  How much "quality," across what performance spectrum, in what force mix, numerical strength, and sustainability, will give our future TFBN the desired mission effectiveness for the most plausible scenarios at a cost we can afford

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A Word on "Large" Versus "Small" Platforms (2)

- For example, it is interesting to note that during the Garrison Era, European navies built navies designed for local operations, and with large numbers of small, single-mission ships. Now, required as they are to project and support EU forces "out of area" over transoceanic distances, the European navies are building fewer, larger, multi-mission ships designed to operate in netted task groups

- The following example is instructive. The Royal Danish Navy, one of the world's most innovative small ship navies, is slimming down (in numbers) and bulking up (in tonnage):

Year	Number of Warships	Aggregate Fleet Tonnage	Average Ship Tonnage
90	67	36,000	537
99	58	45,000	776
04	40	31,000	775
12	29	56,000	1931

- This is the same pattern observed in the US TSBF after World War II, when the large numbers of small, World War II single-mission ships were gradually replaced with a smaller number of larger, multi-mission ships

- The point here is not that many smaller allied navies are now bulking up; instead, the point is that when designing a naval platform architecture, naval operational architecture planners first try to understand what the navy is tasked to do, and then try to figure out how best to do accomplish that tasking with an affordable mix of platforms with the appropriate range of capabilities
  - The average size of platforms will reflect the final design decisions and operational tradeoffs made by naval operational architecture planners

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Projecting Power From the Sea

- The evolving "Sea as Base" Power Projection/Regional Deterrence Fleet reflects six decades of evolution and refinement of an idea first born during the Interwar period, and repeatedly refined during the Battle Forces' long attack across the Pacific. This idea sees:
  - The oceans—or "global commons" –as a base and high-speed avenue over which American military forces can be transported across transoceanic distances; and
  - The littoral seas as a focal point for fleet action to help project decisive Joint combat power ashore

- During the Interwar/Battleship Era years, when the DoN was considering how to force a decisive sea control battle with the Imperial Japanese Navy, the concept of sea basing was an important part of Navy plans:
  - The armored battle represented a mobile naval artillery base, and the primary arm for Battle Force offensive action
  - Aircraft carriers represented mobile aviation bases, from which aircraft could scout for the enemy's battle line and conduct independent raids;
  - The amphibious assault fleet represented mobile assembly areas and forward support bases for the sea-based assault forces used to secure forward operating bases;
  - Underway replenishment ships represented mobile resupply bases; and
  - Tenders and other vessels represented forward fleet depots and repair facilities

- As was discussed, although these forces were originally conceived of as a *Sea-Based Sea Control Battle Fleet*, by the end of the war naval planners recognized that the broad oceans had been transformed into an uncontested US Joint operating base, from which naval forces could *project power* and decisively influence combat operations ashore—especially in defended and contested access scenarios

Projecting Power From the Sea (2)

- Accordingly, by the end of the Second World War, then, the DoN Battle Force had transformed into a *Sea-Based Power Projection Fleet*, designed primarily to support Joint forcible entry operations in contested access scenarios, and to support Joint campaigns ashore
  - The Iwo Jima and Okinawa campaigns were less sea control and more power projection operations in the modern sense of the word

- The ultimate World War II Sea-Based Power Projection Fleet had the same five components envisioned during the Interwar period, but with some important twists:
  - Its component Strike Sea Bases were formed around aviation power projection platforms
  - Its component Maneuver Sea Bases were formed around platforms drawn from the amphibious assault fleet
  - Surface combatants accompanied and escorted both Strike and Maneuver Sea Bases: they provided the bases with close-in protection from air, surface, and submarine attack; and provided both offensive and defensive ship-to-shore gunfire in support of landing force operations ashore
  - The platforms that made up the Strike and Maneuver Bases were replenished and sustained on station by combat logistics force, including ships like fleet oilers (AOs) and ammunition ships (AEs)
  - The platforms that made up the Strike and Maneuver Bases were maintained and repaired in theater by a vast mobile logistics force, including submarine tenders (ASs), destroyer tenders (ADs), and mobile dry docks

- By late 1945, the DoN's Sea-Based Power Projection Fleet (reinforced by the Royal Navy) was prepared to land 1.3 million men (including six Marine divisions) on mainland Japan, and support them with 5,000 combat aircraft, and hundreds of mobile artillery bases (surface combatants)

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Strike Sea Bases in the First Expeditionary Era

- Given aviation's increasing centrality to naval operations during World War II, the DoN elected to develop an affordable mix of aviation power projection platforms so as to broadly distribute naval aviation capabilities throughout the fleet

- The DoN developed three basic types of platforms:
  - Large fleet carriers (CVs), capable of operating large multi-purpose carrier air wings of up to 100 aircraft (24 of a total of 32 *Essex/ Ticonderoga*-class CVs authorized were completed between 1942 and 1950);
  - Light aircraft carriers (CVLs, converted light cruiser hulls), capable of keeping up with fast carrier task forces, and operating a "half carrier air wing" of approximately 45 aircraft (nine *Independence* CVLs were completed); and
  - Escort carriers (CVEs, converted merchantmen), capable of keeping pace with slower amphibious task forces and convoys, and operating approximately 30 aircraft (over 100 CVEs of various classes were built/converted)

- In the Pacific Theater, the Battle Force's preferred Strike Sea Base consisted of three large *Essex*-class CVs and one *Independence*-class CVL (although there were many variations off this baseline)
  - The carriers' carrier air wings changed over time as the fleet's focus shifted from sea control to power projection
    - In the early part of the war, 75% of the air wing consisted of aircraft specialized for anti-surface warfare (e.g., dive bombers and torpedo bombers), while the remaining 25% were fighter-interceptors
    - By 1945, the ratio had nearly reversed: dual-purpose fighter-bombers made up 70% of the CAW's aircraft; the rest were optimized for ASuW

CSBA

Maneuver Sea Bases in the First Expeditionary Era

- Battle Force Maneuver Sea Bases carried all personnel and equipment of an assault force to an amphibious objective area, and then supported and sustained their attacks from the sea
  - Personnel were carried on APAs, or Amphibious/Attack Transports, Personnel
  - Cargo was carried aboard AKAs, or Amphibious/Attack Transports, Cargo
  - A variety of landing craft—the first "surface connectors"—were carried aboard APAs, AKAs, and a new ship called the Landing Ship, Dock (LSD), a revolutionary amphibious platform with a "wet-well," introduced in 1943
  - Amphibious tractors were delivered by LSD and later the Landing Ship, Vehicle, (LSV), which introduced a stern gate/dry well from which amphibious tractors could "splash" and make their way to a beach, also in 1943

- These amphibious assault ships were supplemented by a family of large intra-theater connectors—all of which were designed to discharge their entire cargo directly onto a beach:
  - The Landing Ship Tank, or LST: FLD, 3,640 tons; range, 6,000 miles (LST-542 class)
  - The Landing Ship Medium, or LSM: FLD, 1,095 tons; range 4,900 miles
  - The Landing Craft, Infantry (Large): FLD, 389 tons; range, 4,000 miles

- By 1945, the aggregate Maneuver Sea Base fleet included a total of 2,547 amphibious assault ships and large intra-theater connectors
  - These were, in turn, serviced by thousands of assault connectors, or small landing craft
    - During World War II, 25,171 landing craft weighing less than 50 tons were built, or an average of ten surface connectors for every large sea base maneuver platform or intra-theater connector

Maneuver Sea Bases in the First Expeditionary Era (2)

- The Battle Force's combined Maneuver Sea Base could transport and sustain the landings of 15 division equivalents, out of a total US force structure of 85 Army (note: these figures do not count an additional five Army airborne divisions) and six Marine divisions
  - In other words, the combined Maneuver Sea Base fleet could simultaneously lift 16% of the entire World War II division-based force structure
- The average speed of advance for a World War II-era Maneuver Sea Base was about 10 knots
  - The closure speed was limited primarily by the large numbers slow intra-theater connectors that would support large scale forcible entry operations from intermediate support bases (ISBs) located outside the amphibious operating area

As the DoN Adjusted to its Unchallenged Post-War Maritime Supremacy, it Began to Think About its Sea-Based Power Projection Fleet in a New Way

"In the old theory the sea was the scene of operations and navies consequently had to be based on land. In the ultimate sense that is still true since man must still draw his sustenance and materials from land. But it is also possible to argue…in a very real sense the ***sea is now the base*** from which the Navy operates in carrying out its offensive activities against the land…

Carrier aviation is sea based aviation; the Fleet Marine Force is a sea based ground force; the guns and guided missiles of the fleet are sea based artillery. With its command of the sea it is now possible for the United States Navy to develop the base-characteristics of the world's oceans to a much greater degree than it has in the past, and to extend significantly the "floating base" which it originated in World War II…

The objective should be to perform as far as practical the functions now performed on land at sea bases closer to the scene of operations. ***The base of the United States Navy should be conceived of as including all those land areas under our control and the seas of the world right up to within a few miles of the enemy's shores.*** This gives American power a flexibility and a breadth impossible of achievement by land-locked powers" (emphasis added)

"National Policy and the Transoceanic Navy"
Samuel Huntington, 1954

The Independence Suggested by Huntington Was Reflected During the Garrison Era Most Clearly in the DoN's "Sea as Base" Strike Fleet

- Given the centrality of carrier operations during World War II, it is not at all surprising that ***independent, mobile, naval aviation strike bases*** played most prominently in the DoN's initial conception of a "Sea as Base" Strike Fleet:

  "The net result is that naval forces are able, without resorting to diplomatic channels, to establish off-shore, anywhere in the world, airfields completely equipped with machine shops, ammunition dumps, tank farms, warehouses, together with quarters and all types of accommodations for personnel. Such task forces are virtually as complete as any air base ever established. They constitute the only air bases that can be made available near enemy territory without assault or conquest, and furthermore, they are mobile offensive bases that can be employed with the unique attribute of secrecy and surprise, which contributes equally to their defensive as well as offensive effectiveness."

  Admiral Chester Nimitz

- However, at the very end of the Garrison Era, with the development of the VLS and the Tomahawk land attack missile, surface combatants—long the defensive shield for the Navy's mobile strike bases—began to assume a more important fleet strike role
  - The offensive strike role of surface combatants increased as the VLS began to proliferate, and this gave the surface warfare community increasing leverage over the submariners during the inter-era transition period between the Garrison and Joint Expeditionary Eras
    - With the demise of the Soviet sub fleet and the need for ASW de-emphasized, submarines could not compete with surface combatants in terms of strike payload
    - As a result, the submarine community attempted to build a floor for force structure based on ISR mission days rather than warfighting requirements

However, Given the Era's Associated Reality of Assured Forward Littoral Access, the DoN's "Sea As Base" Maneuver Fleet Took a Much Different Direction

- The Garrison Era's last renaissance of large scale maneuver and attack from the sea occurred between 1961 and 1964, with the Kennedy Administration's emphasis on "flexible response"
  - In October 1964, due to concerns that the Navy-Marine Corps team had lost their ability to conduct a large-scale amphibious landing across transoceanic distances, the DoN Battle Force conducted Exercise STEEL PIKE I, a Marine Amphibious Force landing exercise in Spain
    - Over 20,000 Marines and 5,000 vehicles were landed from amphibious assault ships, supported by carriers and surface combatants
  - STEEL PIKE I was supposed to be the first of a series of annual DoN Battle Force exercises

- However, events in the Republic of Vietnam were to derail the DoN plan
  - This long war, which saw no major amphibious operation, focused the Marine Corps on sustained operations ashore
  - One consequence of the Marines' focus on sustained operations ashore was that after Vietnam, the Marines gradually began to place as much attention on the rapid closure/reinforcement of land forces as they did on amphibious forcible entry operations
    - This led to the prepositioning of Marine equipment sets on both land and sea
    - As discussed previously, the NALMEB and MPF squadrons reflected the Marine emphasis on access sensitive, rapid response options

The Legacy Garrison Era "Sea as Base" Maneuver Fleet is Much Less Independent Than the Strike Fleet

- The current "Sea as Base" Maneuver Fleet—a legacy of Garrison Era thinking--has three major components, each optimized for a different mission:
  - The ***Amphibious Landing Fleet*** is optimized for forcible entry operations
    - This landing fleet, like the vast amphibious fleet of World War II, is designed to carry intact combat units—including their personnel, equipment, and cargo—and to launch and support their attacks from and through a defended littoral
    - The fleet consists on updated amphibious ship designs developed during the Garrison Era, with an average rate of advance of 20-22 knots (a 100% increase over the first Expeditionary Era)
    - The current force of 35 ships can carry approximately 2.5 Marine Expeditionary Brigade (MEB) equivalents (although with critical deficiencies in "vehicle square footage")
  - The ***Maritime Prepositioning Fleet*** is optimized for rapid response missions in assured access conditions, including the rapid intervention or the rapid reinforcement of a Marine or Joint lodgment. This fleet includes:
    - *The Maritime Prepositioning Force, or MPF*, pre-loaded with equipment, supplies, ammunition, and fuel, to support the rapid closure of Marine Expeditionary Brigades
      - The current force of 16 MPF (Enhanced) ships is organized into three squadrons, each capable of carrying the equipment and supplies for a Marine Expeditionary Brigade

The Legacy Garrison Era "Sea as Base" Maneuver Fleet is Much Less Independent Than the Strike Fleet (2)

- *The Combat Prepositioning Force, or CPF*, pre-loaded with equipment, supplies, ammunition, and fuel, to support the rapid closure of one Army heavy combat brigade and to provide sustainment for follow-on Army combat forces
  - The current force of eight Large Medium Speed Roll-on/Roll-off (LMSR) ships lifts one, "2x2" mechanized brigade (i.e., a brigade with two armored and two mechanized infantry battalions)
- *The Logistics Prepositioning Force, or LPF*, positions combat stores of the Defense Logistics Agency, US Air Force, and US Navy on ships maintained in forward operating theaters, and provides logistics support to the USMC. The current force consists of ten ships:
  - Four ships carrying weapons and supplies to support US Air Force operations;
  - Two tankers converted by the Defense Logistics Agency to perform as offshore petroleum distribution platforms—sea based fuel farms;
  - One Navy logistics support ship; and
  - Three USMC logistics support ships:
    - » Two Aviation Support Ships (T-AVBs); each ship carries the Intermediate Maintenance Activity (IMA) for Marine aviation squadrons; and
    - » A high-speed transport vessel supporting Marine forces on Okinawa
- In time of crisis, the ships associated with the MPF, CPF, and LPF sail to a sea point of debarkation (an SPOD, or deep water port) and discharge their cargo ashore. The personnel associated with the equipment carried on the ships (if any) are flown to a nearby airfield from outside the theater to assemble and prepare the equipment for combat

The Legacy Garrison Era "Sea as Base" Maneuver Fleet is Much Less Independent Than the Strike Fleet (3)

- The ***Surge Sealift Fleet*** is optimized for the rapid transoceanic transport of heavy combat equipment from CONUS
  - These ships—large roll-on/roll-off (RO/RO) type vessels—are kept in a high state of readiness (activation times within 96 hours) and are designed to quickly transport the heavy vehicles associated with mechanized and armored divisions
  - The current surge sealift fleet consists of:
    - Eight Fast Sealift Ships (FSSs), which together are capable of lifting approximately one modular Army division with four brigade-sized Units of Action (UAs) at speeds in excess of 30 kts
    - 11 Large Medium Speed RO/ROs (LMSRs), each capable of lifting approximately one UA equivalent, at speeds of 24-25 kts
  - All of these very large ships require a deep water port for discharge

In Other Words, the DoN Now Operates a "Sea as Base" Strike Fleet That "Requires No Permission Slips," and a "Sea as Base" Maneuver Fleet That Does

- Assuming the ongoing modular Army reorganization results in 42 active and 34 reserve brigade equivalents (not counting an additional six airborne brigades and one Ranger brigade), and that the Marines can field a total of eight active and three reserve "regimental combat teams," the "Sea as Base" Maneuver Fleet can lift approximately 21.5 brigades out of a total Joint force structure of 87 brigades (25%)

- Significantly, however, the current 88-ship "Sea as Base" Maneuver Fleet—a legacy of the assured access Garrison Era—***is optimized for unimpeded and guarded access scenarios, and heavily dependent on the availability of deep water ports in a forward theater*** (although they have a secondary capability to discharge cargo "in stream," albeit at much slower rates)
  - Only 2.5 of 21.5 brigade lift equivalents are optimized for forcible entry operations
    - The amphibious assault fleet at the end of first Expeditionary Era alone could lift 15 of 91 total non-airborne divisions (16%); the current amphibious landing fleet can lift 2.5 of 87 total non-airborne brigades (3%)
  - 4 of 21.5 brigade lift equivalents are optimized for the rapid reinforcement mission of a Joint lodgment through either a seized or acquired deep water port
  - 15 of 21.5 brigade lift equivalents are optimized for delivery of forces and equipment through prepared deep water ports in unimpeded access scenarios

- The fleet's emphasis on the delivery of US forces through prepared ports instead of via forcible entry operations is also reflected by the fact that 53 of the 88 ships (60 percent) are manned and operated by civilian mariners and under the control of the Military Sealift Command (MSC)

The "Sea as Base" Maneuver Fleet is Augmented By a Dedicated Logistics Sealift Fleet

- The "Sea as Base" Maneuver Fleet is supported by the ***Ready Reserve Fleet (RRF),*** which is optimized to provide sustained logistical support for US overseas expeditionary operations
  - The 59 ships currently in the RRF are a mere shadow of the vast merchant fleet constructed by the US during World War II
    - The ships are kept in reduced operating status and activated when needed
    - The RRF includes a mix of tankers, crane ships, RO/ROs, heavy lift ships, and lighter-aboard-ship vessels
  - 33 RRF ships were directly involved in Operation Iraqi Freedom, delivering more than nine million square feet of combat cargo to U.S. forces in Iraq

Time for a Change: "Transforming" the Garrison Era's "Sea as Base" Maneuver Fleet in the Joint Expeditionary Era

- With access once again uncertain in the Joint Expeditionary Era, it is therefore not surprising that the idea of rebuilding a true combined arms "Sea as Base" Power Projection Fleet has been given a second life

"Sea basing is the rapid deployment, assembly, command, projection, reconstitution, and re-employment of joint combat power from the sea, while providing continuous support, sustainment, and force protection to select expeditionary joint forces without reliance on land bases within the [joint operational area].

Sea Basing Joint Integrating Concept (JIC)

"Everything we do in the maritime environment is about sea basing."

Admiral Clark, CNO

"Sea basing is the one element linking the global war on terror and major combat operations."

Vice Admiral Joe Sestak, N-8, CNO Staff

However, it is important to remember that sea basing both strike *and* maneuver forces is "transformational" only in the sense that it is an idea whose time has come… *once again*

Building a *"Sea as Base" Power Projection/Regional Deterrence Fleet*

- Recall that when describing the fundamental components of a "Sea as Base" Power Projection Fleet, Samuel Huntington wrote: "*Carrier aviation is sea based aviation; the Fleet Marine Force is a sea based ground force; the guns and guided missiles of the fleet are sea based artillery."*
  - In other words, aviation power projection platforms, maneuver power projection platforms, and surface combatants are the primary components of a "Sea as Base" Power Projection Fleet

- The demonstrated ability of the US to assemble large Joint expeditionary forces, to transport them across transoceanic distances, and to project decisive American military power ashore through and from the littorals—in all potential access conditions—marks the US military as a global military superpower, and underwrites US regional deterrence
  - This capability should be retained, and exercised frequently

- The following discussion will address each of these three components, in turn, and make recommendations for supporting TFBN platforms
  - Decisions made by naval planners assembling the Sea-based Power Projection Fleet during the first Expeditionary Era will be examined for lessons learned, and will inform the recommendations made herein

CSBA

"Sea as Base" Aviation Power Projection Platforms

- Since 1942, no US Joint power projection operation has been conducted without local tactical air superiority—provided either by land-based or carrier-based aircraft, or a combination thereof
  - With access to forward basing once again uncertain, sea base aviation power projection platforms will continue to be vitally important in the Joint Expeditionary Era

- Large deck, nuclear-powered aircraft carriers are a unique US power projection asset. They provide a formidable blend of persistence, combat power, and sortie rate generation for sea-based tactical aircraft that is unmatched in any other navy
  - The current carrier force includes ten nuclear-powered aircraft carriers (CVNs; two classes) and two conventionally powered carriers (CVs; also two classes)
  - The 12 carriers have an aggregate crew of approximately 37,683 officers and Sailors (not including the air wings)

- The 12-ship carrier force is supported by 11 integrated Carrier Air Wings (CAWs; ten active, one reserve)
  - In the near-term, a notional integrated CAW will consist of 12 Navy F/A-18Fs; 12 Navy F/A-18Es; 10 Navy F/A-18Cs; 10 USMC F/A-18Cs; 6 E/A-18Gs; 6 E-2Cs, 2 carrier onboard delivery (COD aircraft); and supporting helicopters
  - The F/A-18C squadrons will convert over time to Joint Strike Fighters (JSFs): for the Navy, the squadron likely will be equipped with the F-35 carrier (CV) variant; for the Marines, the squadron likely will be equipped with the F-35 STOVL variant
  - Once the transition is complete, CAWs will be able to strike a maximum of nearly 1,100 individual aim-points a day using guided air-to-ground weapons; they will also be able to sustain a continuous 24-hour combat air patrol (CAP) over a naval task group, if required (although the preferred means of operations are for two carriers to operate in a day-night cycle)

CSBA

"Sea as Base" Aviation Power Projection Platforms (2)

- The *Nimitz*-class carriers still in production were designed in the 1960s and introduced in 1975; it is the oldest ship design still in production, and must be replaced
- The planned replacement for the *Nimitz*-class carriers, the CVN-21, is scheduled to enter production in FY 2008
  - CVN-21 will have a smaller crew, survivability enhancements, and a new deck "pit-stop" arrangement designed to increase carrier sortie generation rates
    - The carrier will be able to operate in guarded, unimpeded, defended, and contested access scenarios; the key difference in these scenarios will be the range at which the carrier must initially operate to ensure its survival
      - In this regard, CVN-21s are designed to operate new, long-range unmanned air systems such as the Joint Unmanned Combat Air System (J-UCAS) that may allow them to contribute during early contested access operations
- However, these ships will be the single most expensive platforms in the DoD
  - The first carrier, with its associated non-recurring costs such as R&D, will approach $13 billion, or 1.3 times the total average yearly shipbuilding budget
  - Follow-on carriers are projected to cost approximately $7.5 billion, consuming 5 of 7 average ship equivalents in any given year
  - The $7.5 billion procurement cost does not cover the carrier's required mid-life Refueling and Complex Overhaul (RCOH), or its end-of-life decommissioning
    - *Nimitz-c*lass RCOHs cost $3.0 billion, or 2.14 ASEs
    - The Navy has yet to pay for a nuclear carrier decommissioning
      - The current rough order of magnitude planning figure for a CVN decommissioning is $1.14 billion (compared to a CV decommissioning cost of $.26 billion)

"Sea as Base" Aviation Power Projection Platforms (3)

- Because of the CVN-21's high cost, and given the vastly improved capabilities of both the ship and its air wings, it is unlikely the Navy could or should replace the current 12 carrier force with CVN-21s on a one-for-one basis
  - With a notional expected service life (ESL) of 50 years, a 12-ship force would require that a new carrier be built once every four years
  - The total shipbuilding costs to recapitalize the 12-ship force with CVN-21s would be somewhere on the order of $145 billion (including R&D and procurement, RCOH, and nuclear decommissioning costs)
  - The recent announcement that the carrier fleet will shrink by one carrier reflects, in part, the enormous pressure that these ships put on DoN shipbuilding budgets

- Fortunately, technology now offers some potential substitutes for the more capable CVNs
  - With the introduction of VSTOL and STOVL fixed-wing tactical aircraft, it is possible to get tactical aviation to sea on much smaller and cheaper conventionally-powered platforms, termed CVVs in *Jane's Fighting Ships*
  - As discussed earlier, this is the route taken by most other navies; only the British, French, and Indian navies are contemplating building "large deck" carriers capable of operating conventional take-off and landing aircraft modified for carrier service
  - Over time, one would expect unmanned aviation systems to provide even more options for sea-based aviation platforms

- However, the US likely would be ill-advised to completely abandon its monopoly on large, nuclear-powered sea base aviation power projection platforms
  - These platforms can simply not be copied by competing naval powers
  - They offer advantages in mobility, air wing flexibility, and sortie generation rates that are unlikely to matched by any other sea-based aviation power projection platform or group of platforms

"Sea as Base" Aviation Power Projection Platforms (4)

- In the US TFBN, "big deck" amphibious ships such as the LHA or LHD can augment the larger CVNs/CVs in a secondary CVV role
  - The primary role of these ships is to provide rotary wing (helicopter and tilt-rotor aircraft) support to Marine sea-based maneuver forces
  - In a mixed rotary wing/fixed wing CVV role, these ships can carry approximately 26 helicopters and a small detachment of six AV-8B Harriers
  - However, the ships can operate as all-VSTOL/STOVL "Harrier Carriers," carrying from 22 to 24 AV-8Bs

- Despite the encouraging move toward intra-Departmental cooperation represented by the aforementioned Navy-Marine Corps Tac-Air Integration Plan, there are several looming problems or unanswered questions for DoN aviation:
  - The planned force of 12 LHA/LHDs is incapable of handling the next generation of larger and heavier vertically-launched USMC aircraft (JSFs and the MV-22 tilt-rotor aircraft) in the numbers required to support sea-based maneuver operations
    - The desire of Marine aviators to operate from larger "dual tram"-type amphibious aviation platforms that would allow the simultaneous operation of both MV-22s and JSFs is fiscally unrealistic
  - Additionally, the current Tac-Air integration plan is for the Marine Corps to ultimately provide one STOVL JSF squadron for each of the ten active duty CAWs; however, it is not yet clear that the STOVL JSF can be easily incorporated into carrier deck ops

- It might therefore be prudent to rethink Departmental aviation plans and develop a more cost-effective near-term blend of *distributed* Departmental aviation platforms, built to capitalize on Navy and Marine aviation strengths
  - And, in the spirit of the Joint Expeditionary Era, it may make sense to think of these platforms as true Joint assets

"Sea as Base" Aviation Power Projection Platforms (5)

- Such a plan would be informed by the solution pursued by the DoN in he first Expeditionary Era, during World War II
  - Up through mid-1944, Navy squadrons formed the carrier air wings on all of the carriers
  - Marine squadrons were often transported to an operating area on carriers, but once there, they most often operated ashore
  - However, after Rabaul was by-passed and as the DoN continued its Central Pacific drive toward Japan, the issue of basing Marine aviation at sea was a topic of hot debate within the DoN
    - In July 1944, the DoN leadership re-endorsed the principle that the focus of Marine aviation was on close air support of Marines in combat
    - It was mutually agreed by the Navy and Marines that the Marines would provide six 30-plane air groups for service on six *Commencement Bay* CVEs (four made it to the Pacific before the war was over)
    - As part of the agreement, Marine fighter squadrons would also augment Navy CAWs when the threat warranted it (as they did during the *kamikaze* attacks off of Okinawa)

- The big-deck LHA(R), currently programmed to replace four aging LHAs starting in FY 2007, is a poor "Sea as Base" Maneuver platform because it lacks a surface connector interface (a well deck)
  - This ship can carry either 23 JSFs or 28 MV-22s, but with no well deck, it cannot land Marine forces at a littoral penetration point via surface connectors
  - This ship might therefore be best thought of as a new CVE (an escort carrier capable of keeping up with amphibious task forces, but not fast carrier task forces) that carries a "half carrier air wing" of strike fighters

CSBA

"Sea as Base" Aviation Power Projection Platforms (6)

- Pursuing a new combination of CVN and CVE strike groups (CVNSGs and CVESGs, respectively), would appear to be a good way to maintain TFBN air combat capacity at a reasonable cost, and would help to start distributing TFBN air combat capacity over a larger number of sea-based aviation power projection platforms

- Moreover, re-designating both CVN-21s and CVEs as Joint "Sea as Base" power projection assets would increase their value in the context of evolving Joint Multi-dimensional Battle Networks
  - J-CVNs, or Joint, nuclear-powered, large aviation platforms, would support heavier, longer-range catapult-assisted naval aircraft and J-UCAS squadrons
  - J-CVEs, or Joint medium aviation platforms, would support lighter, shorter-range Marine Corps and Air Force STOVL aircraft, and retain an inherent ability to support Joint rotary wing aircraft

- These Joint aviation power projection platforms could also be augmented by additional Joint- Afloat Forward Staging Bases (J-AFSBs)
  - The idea of using an aircraft carrier as a J-AFSB can be traced to operations off of Haiti during the mid-1990s, when an aircraft carrier was used to transport and support Army helicopters
  - The idea was perhaps more dramatically demonstrated during Operation Enduring Freedom when the aircraft carrier *Kitty Hawk* served as a SOF aviation support base
  - The Army is currently pursuing its own AFSB to support the helicopters and troops associated with a single brigade of the 101st Air Assault Division
  - A J-AFSB could potentially lift large numbers of rotary wing aircraft required for contingency operations, which place a huge demand on Joint strategic airlift in fast developing crises

"Sea as Base" Aviation Power Projection Platforms (7)

- Additional commercial distributed aviation power projection platforms may be developed to support the sea basing of Marine rotary wing aircraft (these will be discussed more fully in the section on Sea as Base Maneuver platforms)

- However, the high non-recurring R&D costs necessary to design and build other distributed aviation platforms, such as the Corsair or Sea Archer concepts, as well as the uncertainty over the actual flight performance of the STOVL JSF and J-UCAS, argue against a near-term move toward even smaller aviation support platforms
  - Press reports suggest that the USAF is increasingly interested in heavier, longer-range J-UCASs that may not be suitable for carrier operations
  - Moreover, weight and performance concerns still surround the STOVL JSF

- Although expensive, the CVN-21 and LHA(R) designs are sufficiently mature to move into production; delaying their production to pursue entirely new ship designs would likely just increase costs over the long run
  - That said, these ships will skew long-range shipbuilding plans in unacceptable ways unless Congress authorizes the ships to be incrementally funded over time
  - Said another way, given the expected shipbuilding budget climate, if Congress wants the DoN to stay in the aviation power projection platform business, it must consider steady incremental funding of these ships

"Sea as Base" Aviation Power Projection Platforms (8)

- ***Tentative recommendations for "Sea as Base" Aviation Power Projection Platforms***
  - When the USS *George H. W. Bush*—the tenth and last *Nimitz*-class carrier—is commissioned in 2008/09:
    - Decommission both of the last two conventional carriers (*Kitty Hawk* and the *JF Kennedy)* (note: this plan was developed before the announced retirement of the *JF Kennedy)*
    - Redesignate the nuclear-powered USS *Enterprise,* CVN-65, as a Joint Afloat Forward Staging Base, or J-AFSB
    - Redesignate the remaining ten *Nimitz*-class aircraft carriers as J-CVNs
      - Starting in FY 2008, begin to replace the ten *Nimitz* carriers with CVN-21s on a one-for-one basis
      - With expected service lives of 50 years, these ships would be authorized every five years, and built on a six-year production schedule
      - The J-CVN-21s should be capable of sea-basing a full JFACC staff, and be designed from the beginning to support J-UCAS operations
    - Redesignate the LHA(R) as a J-CVE
      - Build one J-CVE every three years starting in FY 2007, with an initial class objective of four ships
      - The J-CVE should be capable of sea-basing a small JFACC staff

"Sea as Base" Aviation Power Projection Platforms (9)

- This basic plan would result in a mid-term force of 10 J-CVNs, 4 J-CVEs, and one J-AFSB, for a total of 15 Joint aviation power projection platforms
  - These would be augmented by a further 8 LHDs in the sea-based maneuver fleet, as well as other Sea as Base Maneuver platforms (to be discussed in that section)

- Reorganize supporting DoN CAWs into nine active and one reserve J-CVN carrier air wings, consisting of permanent Navy and reinforcing Joint squadrons:
  - Assuming the 10-plane USMC F/A-18C/STOVL JSF squadron would be replaced by a second 10-plane Navy JSF squadron, this plan would result in an increased requirement for 80 (operational) CV JSFs, offset to some degree by a decreased requirement for 38 aircraft (12 fewer F/A-18Es, 12 fewer F-18Fs, six fewer EA-18Gs, six fewer E-2Cs, and two fewer COD aircraft)
  - CVN CAWs would include provisions to support both Navy and Air Force J-UCAS squadrons
  - Experiments that combine CV and STOVL JSFs in the carrier deck cycle would start as soon as these aircraft entered fleet service
    - Depending on the outcome of these experiments, each CAW might also have an associated "surge" STOVL JSF squadron provided by the Marines, or perhaps the USAF (note: the USAF is also currently planning to buy the STOVL JSF)

"Sea as Base" Aviation Power Projection Platforms (10)

- Form four J-CVE CAWs, with 20-23 STOVL JSFs
  - These air wings could either be all-Marine air wings or Joint air wings consisting of Marine and Air Force JSFs
  - Over time, the wings might also include an electronic attack version of the JSF, and perhaps a rotary wing airborne early warning aircraft

- For the *Enterprise*, in her role as a J-AFSB:
  - Remove two of her four operational catapults and most of her combat systems, retaining only her self-dense systems and systems that support connectivity to the TFBN
    - Convert her crew to a mixed active/reserve/civilian crew
    - Retain the ship in ROS status (thereby extending her service life and delaying her nuclear deactivation costs)
  - During peacetime, her mission would be to act as a test platform for future sea base aviation power projection platforms. For example, tests could be held to:
    - Determine the speed and size requirements for future J-AFSBs and other aviation power projection platforms during Battle Network Surge operations
    - Determine if a sea based platform that can land and launch C-130s provides a valuable capability for the sea base
  - During crises, the ship would support either SOF, Army, USMC, or combined Joint Air Wings, depending on the mission
    - The ship would focus on Joint rotary wing support, but could be used to sea-base USMC EA-6B/EA-18G electronic attack aircraft

"Sea as Base" Aviation Power Projection Platforms (11)

- Moving to a 10 big deck J-CVN force would also save the costs of one $3.0 billion *Nimitz* RCOH (the *George Washington* would be replaced by J-CVN-21, and be retired in FY 2014, eliminating this cost), and hasten the substantial projected manpower savings associated with the CVN-21:
  - J-CVN-22 would replace the *Nimitz* in FY 2019, six years before the end of her expected service life
  - J-CVN-23 would replace the *Eisenhower* in FY 2024, three years before the end of her ESL
  - J-CVN-24 would replace the *Carl Vinson* in FY 2029, three years before end of her ESL
  - J-CVN 25 would replace the *Theodore Roosevelt* in FY 2034, two years before end of her ESL
  - J-CVN 26 would replace the *Abraham Lincoln* in FY 2039 at the end of her ESL of 50 years
  - J-CVNs 27-30 would replace the remaining four *Nimitz* carriers between FY 2044 and FY 2059 within one year of their 50 year ESLs

- ***After FY 2008,*** (the first J-CVE is authorized in FY2007, the first J-CVN is authorized in FY 2008), seek Congressional approval for incremental funding of large, complex, Joint aviation power projection platforms: J-CVN-21s, J-CVEs, J-AFSBs, as well as large amphibious big-decks (LHDXs, to be discussed)
  - The above plan would require approximately $3.16 billion a year (2.26 ASEs), steady state, through FY 2038
  - This steady-state funding profile would support six additional J-CVNs, three additional J-CVEs, seven LHDXs, six *Nimitz* RCOHs, and six nuclear carrier decommissionings

"Sea as Base" Aviation Power Projection Platforms (12)

- Total cost savings for a "10+4" J-CVN/J-CVE force are unclear, although substituting four J-CVEs in place of two JCVN-21s will save approximately $13 billion in carrier life cycle procurement costs (assuming a $7.5 billion initial procurement cost, a $3 billion mid-life RCOH, and $1.14 billion decommissioning costs for each J-CVN, and a $2.5 billion initial procurement cost and $.13 billion decom costs for each J-CVE)
  - The precise O&S savings associated with this move are unclear, although the interim FY 2019 force of 8 *Nimitz* class carriers, 2 J-CVN-21s, and 4 J-CVEs would carry approximately 4,300 fewer crew members than the current 12-carrier force (a 11.5% reduction)
    - An additional 800-1,000 billet savings would accrue every time a J-CVN-21 replaced an additional *Nimitz*-class carrier (depending on the final crew savings seen in the CVN-21 class)

- If the STOVL JSF and J-UCAS prove themselves to be capable sea-based aviation assets, further alterations to this plan should be possible, and could result in an even greater number of distributed TFBN aviation power projection platforms, at a cheaper price
  - Until it is certain these two new aircraft will perform as advertised, however, it would be premature to make plans for further reductions in the big-deck carrier force
  - That said, if these new aircraft do prove out, other more radical aviation power projection platforms options—such as the smaller Sea Archer/Corsair aviation power projection platforms—will likely prove to be attractive

Associated TFBN Shipbuilding Plan: Running Tally

- ***Aviation Power Projection Platforms*** **$**3.16 billion, steady state (2.26 ASEs)

CSBA

Maneuver Sea Bases in the Joint Expeditionary Era

- In an age of uncertain access, and in an age where long-range guided weapons increasingly place fixed forward bases at risk, the idea of assembling forward operating bases *at sea*—and projecting and sustaining ground forces from them—proved to be as attractive to contemporary naval planners as it was to first Expeditionary Era planners
  - As a result, "Sea Basing" is now one of the three "transformational pillars" of *Seapower 21*—the Navy's (and later the DoN's) vision statement, published in October 2002
  - Sea Basing is defined as *"the capacity and/or capability to project rapidly sustainable military power ashore from the sea"*

- Recall that in 1954, Huntington wrote that the objective of a sea base was ***"to perform as far as practical the functions now performed on land at sea bases closer to the scene of operations"***
  - A close review of Huntington's writings suggests that the most important point he was making was that the DoN should consider the entire "sea as base," and should organize itself for power projection operations across transoceanic distances
  - In contrast, the DoN vision takes Huntington literally—that is to say, it seeks to create a fully functional Joint forward operating base on the sea, on which maneuver forces can assemble, from which maneuver forces can attack and be sustained, and to which they can return to "reconstitute" and prepare for additional attacks

- Importantly, a debate over the wisdom of trying to completely recreate land bases at sea never occurred within DoD as a whole
  - As a result, the question of how the legacy "Sea as Base" Maneuver Fleet might be best transformed to support future Joint Multi-dimensional Battle Networks in the Joint Expeditionary Era never occurred, and each of the services has been more or less pursuing its own vision of sea basing with modest Joint oversight

The Vision of Recreating Land Bases at Sea is at Least Three Decades Old

"*The time is upon us, when we no longer are tied to the buildup on the beach as a sine qua non of an amphibious operation. We can cut the umbilical cord of shore based facilities, including beaches, beach exits, gradients, airfields, ports, etc., and operate entirely from bases afloat. Seabase is the coming era of the amphibious force...It is a way of providing an appropriate sized landing force anywhere in the world. The requirement for "stepping stones" or land bases on foreign soil is drastically reduced or in some cases eliminated…I would envision the on-station landing forces to remain at Marine Amphibious Unit (MAU) size, and the CONUS launched landing forces to be of Marine Amphibious Brigade size."*

"Seabase: The True Amphibious Operation"
LtCol J.W. Hammond, Jr.
Marine Corps Gazette, 1971

- However, the right combination of forces and ship-to-shore connectors necessary to make LtCol Hammond's vision a reality had yet to be built. The premise behind the DoN's new sea basing vision was that this circumstance is about to change
  - The new vision of a Maneuver Sea Base is itself guided by the aforementioned "transformational" vision of Joint early entry forces as light, information-intensive forces supported by remote Joint guided weapons fires
    - The relatively small size of these light early entry forces—and their reduced logistics requirements—seemed to make the vision of establishing forward operating bases at sea more realistic
  - Moreover, the vision is informed by the evolving ideas of aerial maneuver and air mechanization, enabled by new, more capable aerial delivery platforms

CSBA

Making The Vision Work: Sea Base Connectors

- In this regard, Marine planners long ago recognized that the health of any Maneuver Sea Base depended critically upon its "circulatory system"—the supporting system of systems of sea base connectors needed to transport a maneuver force based at sea onto land
  - In the first Expeditionary Era, surface connectors dominated. There were three basic types:
    - *Intra-theater surface connectors* were larger craft with intra-theater range and capable of beaching and disgorging their cargo ashore
    - *Ship-to-shore surface connectors*, or landing craft, were carried by the larger ships in the sea base
      - They were the most numerous of all types; the the ratio of connectors to sea-basing platforms and larger intra-theater connectors was 10-to-1
    - *Surface ship-to-objective connectors*, such as specially designed amphibious tractors, amphibious tanks, and amphibious trucks
  - In the Garrison Era, however, aerial sea-base connectors assumed a prominent—if not dominant—role in DoN sea basing plans
    - With the development of 20-knot sea-base maneuver platforms, the large sea-base augmentation fleet of slow, beachable, intra-theater surface connectors disappeared
    - With the development of the helicopter and the associated concept of vertical envelopment, emphasis was placed on developing new *aerial ship-to-objective connectors*:
      - Medium assault support helicopters, like the CH-46, were optimized for transporting people
      - Heavy lift logistical helicopters, like the CH-53, were optimized for transporting equipment and supplies

CSBA

Making The Vision Work: Sea Base Connectors (2)

- Despite the prominence of aerial connectors, surface connectors still played an important role in delivering heavy Marine combat equipment ashore
  - The heavy lift Landing Craft, Utility (LCU) became the primary ship-to-shore surface connector, augmented by a larger numbers of smaller Landing Craft, Medium (LCMs), Landing Craft Vehicle and Personnel (LCVPs), and Side-Loading Warping Tugs (SLWTs)
  - Toward the latter part of the Garrison Era, a new type of high-speed ship-to-shore surface connector—the Landing Craft, Air Cushion, or LCAC—was developed
    - » Riding on a cushion of air, the LCAC can carry equipment, supplies and personnel at high speeds (40 knots) across 70% of the world's beaches and deposit them a short distance inland
  - Surface ship-to-objective connectors were also improved
    - » Amphibious assault vehicles (AAVs), a combination amphibious tractor/armored personnel carrier, were developed

- The LCAC was the first of four new connectors envisioned by the Marines that might enable them to conduct tactical landings launched from ships steaming over-the-horizon (to facilitate both surprise and force protection). The other three connectors included:
  - A new aerial ship-to-objective connector, the aforementioned MV-22 Tilt-rotor, which was a much more capable platform than the CH-46 helicopter it was to replace;
  - An improved CH-53E aerial ship-to-objective logistics connector, which was capable of lifting far heavier loads than its predecessor; and
  - A new surface ship-to-objective connector called the Expeditionary Fighting Vehicle (EFV)—originally called the Advanced Amphibious Assault Vehicle (AAAV)—which was a high-speed amphibious tractor/infantry fighting vehicle

Making The Vision Work: Sea Base Connectors (3)

- Since the mid-1980's, these four new sea base connectors have been the focus of Marine Corps procurement plans, and together they helped to spur the development of new concepts for maneuver from ships at sea, described in the Marine operational concepts known as Operational Maneuver From the Sea (OMFTS) and Ship-to-Objective Maneuver (STOM)
  - Both visions see a seamless maneuver of Marine combat units from ships located over-the-horizon to objectives located deep inland
  - In these visions, the beach is no longer the focus of the initial assault; instead, the inland objective is the focus of operations from beginning to end
  - The new Marine ideas of maneuver from the sea thus started to mirror those of one of the masters of sea-based operational maneuver, Army General Douglas MacArthur
    - The maneuver force, under cover of airpower, would seek to land where the enemy wasn't, and to quickly move deep inland

- However, as has been discussed, the visions of OMFTS and STOM rely most heavily on aerial ship-to-objective connectors
  - The emphasis on aerial connectors is having an early an important impact on the DoN's evolving sea basing plans

CSBA

Enter the Defense Science Board

- Although there was no broad Joint debate on Sea Basing, shortly after *Seapower 21* was published, the Secretary of Defense asked the Defense Science Board (DSB) to consider the DoN's new Sea Basing vision
  - The August 2003 Final Report of the Defense Science Board on Sea Basing endorsed the vision, calling the assembly of forward operating maneuver bases at sea "a critical future joint military capability" for the US
  - The DSB asserted that *"Today's amphibious operations focus on assaults over the shore and into seaports, to establish footholds ashore permitting the build-up of sufficient combat power to conduct operations against inland objectives."*
  - In contrast, *"Operations from a future sea base focus on direct assault of inland objectives (with no operational pause) followed by moves to capture seaports or safe shore lodgments for heavier follow-on forces.*"

- As will be discussed, the DSB conception of Sea Basing was thus nothing more than a new expression of the idea of vertical envelopment pioneered by the Marine Corps over 50 years ago
  - It required two things to make it work: light expeditionary early entry forces with sharply reduced logistics requirements; and a "heavy lift aircraft (>20 tons) with theater-wide range that can be based at sea"—a new aerial ship-to-objective connector

- The DSB was very cautious in its recommendations, since it judged the capabilities required for sea basing to be "well beyond" current Navy and Marine Corps operational capabilities
  - The DSB identified twelve areas which required attention before their vision could be realized
    - The DSB referred to these as the "Dirty Dozen"

Enter the Defense Science Board (2)

- Although the DSB did not specifically address the costs associated with such an endeavor, the wide range of required supporting platforms and technological advancements highlighted in their report implied that the complete sea basing of a maneuver force consisting of one or two brigades might be a costly proposition
  - The DSB thus recommended the formation of a Joint Sea Basing Office, to oversee the development of a coordinated, spiral development effort based on *realistic testing*

- In the event, the Joint Sea Basing Office was not created; instead, the subsequent focus of effort was to develop a Sea Basing Joint Integrating Concept (JIC) that would develop the Joint tasks, capabilities, and standards for the future Joint Sea Base

- In the intervening two years between the DSB Report, however, the DoN pressed forward with its own sea basing plans with little more than cursory Joint guidance or supervision

What is the impetus behind the DoN's Sea Basing plans?

CSBA

The Road to Sea Basing: Aerial Maneuver and the MV-22

- The evolving DoN plan for its "Sea as Base" Maneuver Fleet is a child born of many fathers, each of whom had different motivations for creating and nurturing the concept. However, without question, as suggested by the DSB's Report on Sea Basing, the oldest father is the Marines' (and DoN's) enthusiastic embrace of the concept of deep aerial maneuver from a sea base, and their decision to pursue the MV-22

- Marine thinking about aerial maneuver occurred during the early years of the Garrison Era, when all of the services were trying to come to grips with operational and tactical impact of battlefield atomic weapons
  - In the late 40s/early 50s, Marines were well aware that their 1950s surface assault forces could not rapidly cross a beach and immediately transition to high-tempo maneuver toward inland objectives
  - On a potential nuclear battlefield, both to avoid a risky tactical concentration at a defended littoral penetration point, and to achieve greater battlefield dispersion, amphibious planners looked to the helicopter and the concept of *vertical envelopment*
  - Initial thinking was that air-landed assault forces would envelop the enemy forces defending the beaches *from the rear*, thereby opening an uncontested littoral penetration point through which heavy assault forces could rapidly traverse
    - This is the very same thought expressed by the DSB, except that they substituted a defended sea port for a defended beach

- The idea of vertical envelopment was gradually expanded to include the idea of direct aerial ship-to-objective maneuver (vertical assault), which placed further emphasis on the helicopter delivery of amphibious assault forces
  - The Garrison Era planning metric of two-thirds of an assault force delivered by air, and one-third by surface means, can be traced to thinking in the late 1950s/early 1960s

The Road to the Sea Basing: Aerial Maneuver and the MV-22 (2)

  - This thinking spurred the development of the LPH, or Landing Platform Helicopter, a large amphibious assault ship without a well deck, and optimized for helicopter air assault/support

- The 1950s Army leadership included a large number of World War II airborne officers, who were also attracted by the "New School" of airborne thinking, embodied in the idea of air assault/vertical maneuver
  - The idea of air assault and vertical maneuver seemed to solve the biggest problem associated with airborne drops: dispersal and disorganization of the air-landed force
  - As a result, the Army enthusiastically pursued the idea of helicopter-borne Air Cavalry, and then, Air Assault units

- However, Vietnam showed that air assault/vertical maneuver using rotary winged aircraft in defended access scenarios was a risky proposition
  - The US lost 4,865 helicopters in Vietnam
  - In 1971, over 100 helicopters were lost during Operation Lam Son alone
  - These losses largely came ***before*** the April 1972 battlefield employment of man-portable guided anti-helicopter weapons like the US Redeye or Soviet SA-7 Strela

- During and after Vietnam, Marine amphibious planners made a major course correction:
  - First, they rejected the LPH, and instead pursued the first "big deck" *amphibious assault ship*, or LHA
    - This 40,000-ton ship—bigger than a WWII *Essex*-class fast attack carrier—combined both the aviation support capabilities of an LPH, as well as the wet well deck of a LSD or LPD, giving it both air and surface connector interfaces

The Road to the Sea Basing: Aerial Maneuver and the MV-22 (3)

  - Second, they decided to pursue tilt-rotor aircraft for the vertical envelopment mission
    - Because of its greater speeds and higher ceiling, a tilt-rotor had greater operational reach than a helicopter, greater survivability during ingress and egress into an enemy's rear area, and faster troop build-up times

- Just as the Marines began to purse the promise of tilt-rotors, however, US enemies were beginning to absorb the lessons of Vietnam
  - Indeed, guided by lessons learned in Vietnam, during the 1980s US advisers taught the *muhajadeen* fighting the Soviets in Afghanistan to stand and fight against air assaults (the modern day tactical equivalent of defending against an amphibious assault on the beaches)
    - In addition to cannon, heavy machine guns, and small arms fire, forces defending an aerial insertion point could count on shoulder-fired guided anti-aircraft missiles like SA-7s, Blowpipes, and Stingers—and the unguided but no less deadly RPG, which proved to be an extremely deadly multi-purpose anti-aerial maneuver weapon (combining anti-helicopter, anti-armor, and anti-personnel capabilities)
  - Of course, tilt-rotors would be as vulnerable to enemy fire as a helicopter at the air landing point—if not more so, since they cannot "auto-rotate" if hit

- After Vietnam, the Army also moved away from the concept of air assault and turned to the "New, New School" of airborne thinking: air mechanization—landings of light armored forces deep behind enemy lines *where the enemy wasn't*
  - The air maneuver of the 101st Air Assault Division during Desert Storm informed the thinking of the New, New Airborne School

The Road to the Sea Basing: Aerial Maneuver and the MV-22 (4)

  - During the 1990s, MGEN Robert Scales, the leading prophet of the New, New School, used the Army After Next project to expand the idea of deep tactical aerial maneuver into that of "operational maneuver from strategic distances," or inserting mobile, armored combat units directly into an enemy's defended battlespace from bases outside of theater using air transport means
  - Partly as a result of the intense PR efforts associated with the Army After Next effort, the idea of deep aerial maneuver gradually gained currency within DoD

- Aside from the exorbitant costs associated with operational maneuver from strategic distances (the size of a tactical transport force required to support the aerial maneuver of armored combat units from bases more than 500 miles away is quite substantial), an aerial maneuver force is the modern air-land battle equivalent of Jackie Fisher's "battlecruiser"
  - If able to dictate the terms of an engagement, and land where the enemy isn't, the forces might survive; if surprised or if landed where the enemy is, the forces might suffer catastrophic losses (as suggested by actual combat experience in Somalia and Operation Anaconda in OEF)

- Indeed, it is telling that the 101st Air Assault Division conducted no deep tactical aerial maneuvers against the Iraqis in OIF, other than with AH-64 armored helicopter gunships
  - Even then, the results were sobering: nearly all of a 30+ aircraft AH-64 gunship raid were severely damaged by small arms fire at the point of attack
  - The relative fragility of rotary wing aircraft operating in a defended battlespace was also suggested by USMC experience with AH-1Ws helicopter gunships during OIF
    - Although the helicopters suffered few outright losses, fleet-wide battle damage required that the fleet be extensively reworked

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The Road to Sea Basing: Aerial Maneuver and the MV-22 (5)

- Despite the accumulating evidence that large-scale aerial maneuver operations deep behind enemy lines in the mature Guided Warfare Weapons Regime will be every bit as risky as airborne assaults proved to be during and after World War II, the Marines continued to tout the advantages of deep aerial maneuver, and to aggressively pursue the MV-22 and its superior "operational reach"
  - Even after the aircraft was cancelled by OSD for cost reasons, the Marines successfully lobbied the Congress to reinstate the program
  - The MV-22 was the consistent winner in DoD Cost and Operational Effectiveness Analyses (COEAs), especially in scenarios where the landings of troops occurred at ranges greater than 200 miles from a sea base

- However, the decision to pursue the MV-22 had unfortunate implications for the DoN's "Sea as Base" Maneuver Fleet
  - Although faster and capable of lifting more weight than the CH-46, the MV-22 weighs much more and requires 2.22 times the amount of shipboard space
  - Critically, the size of the MV-22's "cargo box" is only 1.2 times that of the CH-46, which means its maximum troop load of 24 Marines is the same
    - Therefore, despite the MV-22's dramatically increased capabilities, the basic size of the Marine assault support squadron is expected to remain at 12 aircraft
  - This meant that the brand new amphibious ships designed to carry Marine rotary wing aircraft to combat would be able to carry less than half the number of aerial ship-to-objective connectors than they were originally designed to carry (the first of the new LHDs was commissioned in 1989—the same year the MV-22 was initially cancelled)
    - In contrast, although the STOVL JSF is approximately one-third larger than the AV-8B Harrier it will replace, its vastly increased capabilities has allowed the size of a sea-based squadron to be reduced to ten aircraft

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The Road to Sea Basing: Aerial Maneuver and the MV-22 (6)

- Setting aside for the moment the risks of aerial maneuver, the MV-22 is not a happy fit for a sea-based aerial ship-to-objective connector
  - With a cargo "box" only 1.2 times the size of the CH-46 helicopter, the MV-22 is optimized for moving people (air assault and raids), rather than people and things (sea-based aerial maneuver)
    - Why does the MV-22 have such a small box? Because it was designed over 20 years ago for the air assault mission, long before the ideas of OMFTS, STOM, and sea basing were fully developed
    - Moreover, for the foreseeable future, because of range limitations associated with supporting heavy lift helicopters and helicopter gunships, a STOM insertion (as opposed to a deep raid) will be generally be limited to no more than 110 miles from a sea base
      - At these ranges, and when tasked with carrying many external "sling loads," the MV-22 has far less of a competitive advantage over a helicopter
  - The MV-22's high relative unit cost also ensures a lengthy fleet introduction and transition, and will cause continual, serious budget tradeoffs within DoN aviation programs
    - Ironically, the need to replace the aging, expensive-to-maintain CH-46 fleet is the strongest selling point for the MV-22; however its troubled development and high unit cost will ensure the CH-46 will remain in service much longer than ever intended by Marine aviation planners

- Without a doubt, the MV-22 is an exquisite deep aerial maneuver platform for SOF/light maneuver forces, and it provides an important capability to conduct deep raids or operations to seize a deep air point of debarkation (APOD) for follow-on forces

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The Road to Sea Basing: Aerial Maneuver and the MV-22 (7)

  - The Special Operations Command is purchasing 50-77 CV-22 variants specially designed for the deep aerial insertion/raiding mission
    - These aircraft carry fewer troops, have double the range of the MV-22, improved survivability features, and may have a nose gun
    - The also have terrain following radar, which allows them to conduct more stealthy, low level flying patterns

- If the vision of the Marine Corps is to become a light, sea-based raiding or early entry force along the lines envisioned by the DSB, the MV-22 would make a valuable, if expensive, addition to the MAGTF ACE
  - However, the Marine Corps vision outlined in their OMFTS and STOM concepts suggest that an important part of the Marine Corps future is to be able to project *medium weight combined arms teams* from the sea base to deep inland objectives

- Since at least 1971, amphibious planners have recognized that the key to an effective medium weight sea-based maneuver force is a *heavy lift* VTOL (HLVTOL) aircraft that can transport combat systems and their crews over longer tactical ranges (which provides for both farther standoff range for the sea base itself, and more rapid buildup of men *and* equipment ashore)
  - The DSB endorsed this thinking, calling for a sea-based aircraft that could lift greater than 20 tons over intra-theater ranges

- Given Army interest in deep aerial maneuver and operational maneuver from strategic distances, a HLVTOL aircraft will undoubtedly be a Jointly developed asset
  - However, given a HLVTOL's high expected costs and forecasted near-term budget limitations, the earliest such an aircraft is likely to enter the Joint force is after 2020

The Road to Sea Basing: Aerial Maneuver and the MV-22 (8)

- With regard to Marine rotary wing aircraft support of the new Sea Basing concept, the key questions facing TFBN designers thus should have been:
  - What is the best mix of supporting aerial ship-to-objective connectors for the maneuver sea base?
  - Should the DoN design-to-lift, and pursue an aircraft more suitable for the maneuver sea base ships that are already bought and paid for?
  - Or should the DoN design-to-connector, and pursue a new platform approach for basing the MV-22 at sea?
  - Or should DoN planners pursue a combination thereof?

- However, the answer to this key sea base design question was preordained by the Marine Corps' dogged pursuit of the MV-22—and the DoN's Sea Basing plans would be largely designed to fit the MV-22 connector

- The decision to "design-to-connector" would have serious repercussions on the ultimate design of the maneuver sea base system-of-systems, which includes both connectors *and* sea basing platforms
  - A legacy MEB air combat element (ACE) equipped with CH-46, CH-53, AH-1, and UH-1 helicopters, and AV-8B VTOL aircraft requires 175 CH-46 equivalent shipboard parking spaces
  - Although each LHA and LHD are touted as being able to carry 42 and 45 CH-46 equivalents, respectively, Marine planners assign them "spotting factors" of 38 and 42 aircraft, respectively
    - This lower spotting factor accounts for the ships' Navy CH-60 Combat Search and Rescue (CSAR) and utility helicopters, as well as the space required for deck handling gear

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The Road to Sea Basing: Aerial Maneuver and the MV-22 (9)

- The programmed force of five LHAs and seven LHDs can thus carry 484 CH-46 equivalents, or 2.77 legacy MEB ACE equivalents
- The 2015 MEB ACE with MV-22s and JSFs will require 246 CH-46 equivalent shipboard parking spaces—a 41% increase in space requirements. The primary driver behind this increase is the MV-22
  - 48 MV-22s require 2.22 times the space than 48 CH-46s
  - 30 JSFs require 1.34 times the space of 30 Harriers
- In other words, the programmed force of five LHAs and seven LHDs will be able to carry only 1.97 future MEB ACE equivalents

- Said another way, to carry 2.77 MEB ACE equivalents in 2015 (the lift capacity of the legacy amphibious fleet), the maneuver sea base would require 681 CH-46 equivalent parking spaces—or the equivalent of 4.7 additional LHDs over those ships needed to transport the same size legacy MEB force
  - ***The added shipbuilding penalty associated with the MV-22 thus adds several million dollars to its real price tag***
    - For example, four LHD equivalents cost roughly $10 billion, which means the shipbuilding penalty each MV-22 imposes on the maneuver sea base is $27 million per plane (assuming a 360 aircraft buy)

- The Marine decision to pursue the MV-22 and the DoN decision to design-to-connector led directly or indirectly to several decisions on maneuver sea base capabilities
  - It led to the decision to reduce the amphibious fleet lift requirement from 3.0 MEBs to a "fiscally constrained goal" of 2.5 MEBs
  - It contributed to the decision to remove the well deck from the aforementioned LHA(R) in order to increase the fleet-wide aviation carrying capacity

CSBA

The Road to Sea Basing: A Role for Surface Maneuver?

- Combined with OSD and DoN antipathy toward "Tarawa-style" amphibious assaults—DoN's decision to design-to-connector also appears to have created a growing impression/assumption *that sea-based surface maneuver and the well decks needed to make it happen are artifacts of a long-passed strategic era*

- A strong case could have been made in the Garrison Era that this was the correct assumption, given the reality of assured access; however, it is far from clear that this assumption is valid for the Joint Expeditionary Era, where access is far less certain

- In any case, the Marine conception of an attack from the sea had long ago changed to embrace the World War II Army conception of trying to land were the enemy isn't
  - The idea of penetrating a littoral across a defended beach was rejected long ago by Marine planners; instead, their plan is to get deep inland, fast
  - Incongruously, many of the same planners who unquestionably accept the likelihood that Joint forces will be able to land aerial maneuver forces where the enemy isn't apparently reject the similar likelihood that surface-delivered forces will be able to transit through an undefended littoral penetration point

- And in this regard, Operation Iraqi Freedom demonstrated that the combination of fast moving combined arms teams, screened by aviation on either flanks, and supported by massed guided weapon strikes—both at the point of attack and against enemy follow-on forces concentrating against the teams—are capable of generating high rates of advance
  - OIF was, in essence, a breakout from an amphibious lodgment area
  - In this operation, distributed Marine Corps combined arms columns, screened and enabled by airpower, moved nearly 500 miles in 28 days

The Road to Sea Basing:
A Role for Surface Maneuver? (2)

- OIF was thus a telling demonstration of the increasing power of *guided weapons-enabled surface maneuver to operational depths*

- Given the technical and operational uncertainties over the course of the competition between man-portable anti-aircraft missiles and rotary wing (and fixed wing) aircraft, retaining a viable and robust surface assault capability would thus appear to be prudent move
  - However, as will be discussed, the emerging plan for the maneuver sea base includes more and more aviation interfaces to support the larger MEB ACE, and fewer and fewer proven surface connector interfaces

CSBA

The Road to Sea Basing: Selective Offload and Sea Base Resupply

- As discussed, the Sea as Base Maneuver Fleet reflects the Garrison Era's legacy of assured access. This circumstance is reflected in the types of ships in the fleet and their optimized cargo delivery procedures
  - Both the Maritime Prepositioning and Surge Sealift Fleets rely on large, Roll-on/Roll-off type ships, densely packed with equipment and supplies
    - The ships have relatively limited berthing capabilities—usually only enough to support their civilian crews and a small number of passengers
      - In a crisis, units associated with the equipment being transported onboard put a small logistical unit on the ships before they sail from their in-theater anchorage or sea point of embarkation (SPOE)
      - During the ship's voyage to their delivery destination, these units prepare equipment—primarily "rolling stock" like trucks, tanks, etc—for discharge (e.g., charging batteries and checking tire pressures; running operational checks)
  - Both the Maritime Prepositioning and Surge Sealift Fleets are optimized for rapid, general cargo discharge alongside piers in deepwater ports, referred to as sea points of debarkation, or SPODs
    - As previously stated, ships in both fleets can offload "in stream," if necessary
      - This technique requires transferring equipment and supplies onto lighterage or motorized causeways from anchorages close to the shore, and greatly increases a ship's offload time
  - The combat units associated with the equipment transported by the ships generally fly to an air point of debarkation (APOD) located near the SPOD
    - From here, the units "marry up" with their equipment, assemble it, conduct pre-combat loading and operational checks, and then deploy for combat
    - This process is referred to as Reception, Staging, Onward movement and Integration (RSOI)

CSBA

The Road to Sea Basing: Selective Offload and Sea Base Resupply (2)

- Operational experience has refined the loading, sailing, and RSOI procedure for both the Maritime Prepositioning and Surge Sealift fleets, resulting in both the efficient delivery of equipment and personnel and impressive strategic closure times
  - For example, during Operation Iraqi Freedom, the Marines activated two MPF squadrons (one six-ship squadron and one five-ship squadron) and ordered them to SPODs in Kuwait
    - All eleven of these ships were completely offloaded in just 18 days
    - Vehicle offload operations averaged under 48 hours per ship, with eight of the eleven ships offloading the vast majority of their vehicles on the first day their respective offloads
    - Container offload operations averaged around 60 hours per ship, with the containers holding 30 days' worth of supplies and sustainment for two Marine Expeditionary Brigades
    - In total, over 7,000 vehicles and nearly 6,000 twenty-foot equivalent unit containers (TEUs) were offloaded during this process, enough to support two reinforced brigade equivalents

- However, in addition to their general dependence on deep water ports, the Maritime Prepositioning and Surge Sealift Fleets have a key operational limitation
  - Because the ships are optimized for general, speedy unloading of cargo, they are generally not capable of "selectively offloading" particular items of equipment or cargo
    - For example, ten days before the attacks into Iraq for OIF, an Army ammunition container ship loaded with 3,800 TEUs had to unload 800 TEUs to get at 560 containers specifically requested by logisticians

The Road to Sea Basing: Selective Offload and Sea Base Resupply (3)

- As a result, as was the case during OIF, the ships generally offload their entire cargo in port, and then return to the common user sealift pool for tasking
  - This helps to build an "iron mountain" of supplies and equipment in the SPOD that is vulnerable to long-range air and/or missile attack

- Ships that are capable of selectively offloading their equipment and supplies have thus been a long-stated requirement for both Joint logisticians and combat commanders
  - The ability to selectively offload ships both removes the logistics vulnerability associated with building an "iron mountain" of supplies ashore, and paves the way for more responsive "sense and respond" logistics concepts that deliver just the right supplies to just the right units operating ashore
  - The key to selective offload is the development of common shipping and packaging containers, that will allow the design of efficient automated warehousing of supplies on maneuver sea base ships

- The concept of ships that were capable of selectively offloading supplies at sea suggested a further, intriguing possibility: if these ships could themselves be replenished at sea, the sea base could be further decoupled from an in-theater land base, giving the sea base even greater operational independence and freedom of action
  - One of the DSB's "Dirty Dozen" therefore was to develop the capability to rapidly transfer TEUs and other heavy cargo from Combat Logistics Force and Ready Reserve Force ships to maneuver sea base ships capable of selective offload
  - Significantly, the DSB called for the ability to conduct these transfers in Sea State 4, an extremely challenging technological goal
    - Sea State 4 conditions are winds of 18-20 knots, and wave heights of 6.5-8 feet

CSBA

The Road to Sea Basing: MPF 2010

- The third father of sea basing was the USMC Maritime Prepositioning Force 2010 (MPF 2010) concept
  - In the late 1990s, Marine concept developers started to contemplate the impending expiration of the three MPF squadron leases, which start to expire in the 2010 timeframe
  - Developed with little more than cursory Navy participation, the MPF 2010 concept posited important new operational capabilities for the 21st century MPF force
    - This concept envisioned the *at-sea assembly of the "fly-in echelon"* as the most important new capability for the MPF, since it would help to by-pass the lengthy RSOI process required at the air and sea points of debarkation for the MPF's personnel and equipment, respectively
    - The at sea assembly of personnel would both exploit the superior force closure times of forward based MPF squadrons and allow a quicker transition of MPF-supported units from deployment to combat

- MPF 2010 concept developers sought to improve the timelines associated with the rapid reinforcement mission in conditions of assured access associated with the Garrison Era; they never intended for the MPF 2010 to compete with amphibious assault shipping, or to be used as a platform from which to launch JFEOs
  - However, if viewed simply as an improvement to the legacy MPF force—known as the MPF (Enhanced), or MPF(E)—the associated costs required to modify the relatively cheap sealift ships for at sea assembly of forces would be exorbitant
    - Indeed, the original MPF2010 concept sat in the VCNO's in-basket for over six months because of affordability concerns

CSBA

The Road to Sea Basing: MPF 2010 (2)

  - On the other hand, if viewed as a "transformational way" to conduct sea-based maneuver operations, the increased operational capabilities of the MPF 2010 ships and their increased costs would inevitably mean that they would compete for the same scarce Battle Force shipbuilding resources, and might be viewed as substitutes for amphibious assault shipping

- The clearest and most explicit early indication that the MPF(F) would compete with amphibious shipping for shipbuilding resources was the 2001/02 rollout of the 375-ship TSBF associated with *Seapower 21's* "Global Concept of Operations (ConOp) Navy"
  - This plan "counted" MPF(F) ships as part of the operational Total Ship Battle Force, as was the long practice for amphibious assault ships
  - The legacy MPF(E) ships were counted as sealift ships, and not as part of the operational TSBF

- The practical result of the Marine Corps' conceptual pursuit of improved MPF capabilities was that just as the idea of improving DoN maneuver sea base forces gained currency, MPF and amphibious warfare ships would start to compete directly for the same missions and the same pot of scarce shipbuilding money
  - And the impression that commercial sea base maneuver platforms would be a good way to save money was to have enormous influence on initial design decisions for the DoN maneuver sea base

CSBA

The Road to Sea Basing: The Need for Speed

- The idea of using the MPF force rather than amphibious assault shipping as the primary basis for the DoN's future Sea Base Maneuver Fleet gathered steam as the Rumsfeld Pentagon began to emphasize the need for increased strategic speed in the Joint Expeditionary Era
  - As early as 1971, Marine planners believed sea basing could substitute speed for mass, *but only for operations other than war*

- Improved strategic closure timelines were an important issue in a planning effort called Operational Availability 2003 (OA 2003)
  - OA 2003 was spurred by SecDef Rumsfeld challenging the planning metrics used by Joint war planners for simultaneous MCO scenarios
  - The effort, sponsored by the JCS J-8, occurred after Operation Enduring Freedom, (operations in Afghanistan), but before OIF (operations in Iraq)
  - The purpose of the effort was to look hard at the planning metrics for near simultaneous MCOs in the Middle East and the Northeast Asian theater, in light of the dominant US lead in the Guided Weapons Regime
  - As discussed, planning for two "nearly simultaneous" MCOs had been the foundation of Joint Expeditionary Era war planning since the 1993 Bottom Up Review
    - To review, the key BUR planning and force sizing construct was for US forces to be able to respond to two nearly simultaneous "Major Regional Contingencies" *in which the US was defending allies against cross-border invasions*
    - While the two MRCs were renamed Major Theater Wars in the 1997 QDR, and again renamed Major Combat Operations in the 2001 QDR, the key force structure and planning metric behind the BUR and 1997 and 2001QDRs remained the same: to conduct two "rapid halts"—or "swift defeats"—of invading forces or enemy plans

CSBA

The Road to Sea Basing: The Need for Speed (2)

- One of the original planning metrics developed for these near-simultaneous major combat operations was a 45-day delay between one MCO and the other
  - This delay was caused primarily by the need to "swing" sea lift forces from one theater to another
- During OA 2003, action officers believed that the transition timing between the two MCOs could be reduced from 45 to 30 days, primarily because of the increased effectiveness of the "hold forces" in the second MCO, and the reduction in logistics required for the swift defeat of the second force
  - Both improvements could be directly traced to US dominance in the Guided Weapons Warfare Regime, and the improved lift and transit speeds of the Surge Fleet, due to the 19 LMSRs built and placed in service after Desert Storm
- However, the action officers then went much further:
  - Much in line with DSB thinking, they concluded that early entry forces, backed up by guided weapons, could "seize the initiative" in any MCO within 10 days, and that enemy invasions could be "swiftly defeated" in just 30 days
  - This thinking was endorsed, and perhaps influenced, by the Office of Force Transformation, which believed that by "rapidly altering initial conditions," the US could win future wars in much faster fashion by "locking out" enemy options and strategies
- The Secretary of Defense endorsed the need for increased strategic speed, and approved what is now known as "10-30-30" metric in Defense Planning Guidance, whereby:
  - US Joint forces should plan to "seize the initiative" in the first MCO in 10 days; swiftly defeat the first enemy in 30 days; and then repeat the process in a different theater in 30 days

CSBA

The Road to Sea Basing: The Need for Speed (3)

- The 10-30-30 planning metric is based on shallow analytics and a "new" theory of war suggested by the great improvement in guided weapons and Joint Battle Networks and the stunning success of OEF
  - However, "old" theories of war posit that enemies will adapt and find ways to adjust to new ways of fighting by their adversaries, and that is precisely what is happening. As discussed:
    - Irregular enemies are "demassifying" by distributing and decentralizing their operations, relying on guerrilla warfare and close-in ambush and attack tactics to bleed, exhaust, and outlast the US Joint Battle Network
    - Traditional enemies are pursuing nuclear weapons to offset the dominant US lead in the conventional Guided Weapons Warfare Regime

- That aside, it is important to keep in mind that the "10-30-30" planning metric was closely associated with the long-standing planning requirement for US forces to be able to respond to two simultaneous cross-border invasions or major combat operations in two widely separated theaters
  - This appears to be among the remotest of all possible future scenarios in the Joint Expeditionary Era
  - The Secretary of Defense himself has indicated that he is willing to take risk in this particular defense planning problem to free up resources for other, more pressing national security problems

- The key question for DoD and DoN planners, then, is whether or not the "10-30-30" metric makes sense for the enduring irregular challenges associated with the GWOT, or for the expected traditional/catastrophic or disruptive/catastrophic challenges in the Joint Expeditionary Era

CSBA

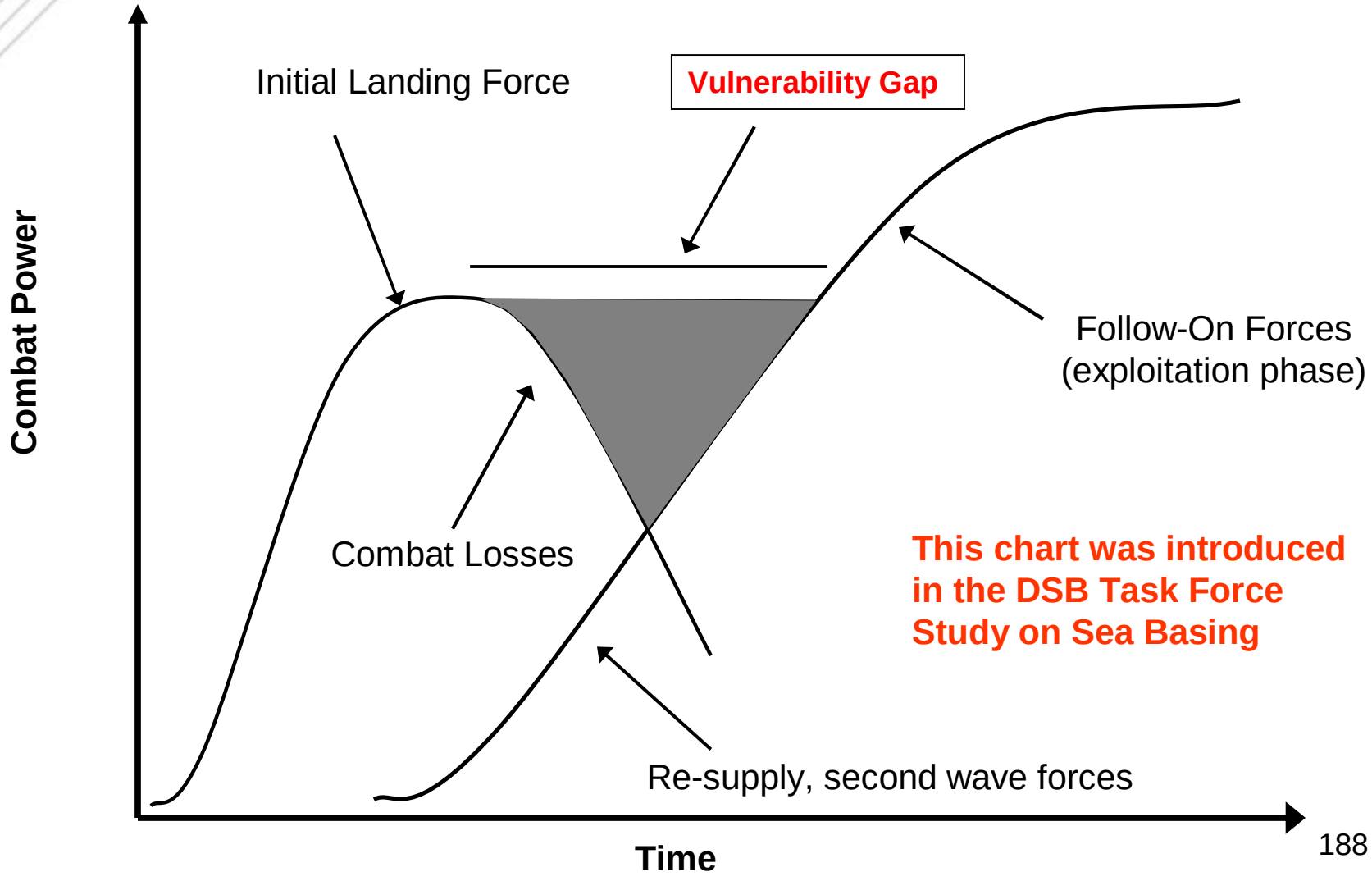
The Road to Sea Basing: The Need for Speed (4)

  - With its large inter-continental airlift fleet and with the "sea as base," the current Joint Multi-dimensional Battle Network is already capable of prompt global action
    - The US Joint Multi-dimensional Battle Network transitioned to combat in a land-locked country located half-way around the world in little more than three weeks after the attacks of 9-11
    - The DoN can assemble a brigade size amphibious task force almost anywhere in the world in less than 30 days

- Said another way: how much strategic speed is enough, and how much are Joint planners willing to pay to get it?
  - For example, it is not at all clear that the difference between a 10-14 day closure time and a 14-18 day closure time will be decisive or significant against irregular challengers
    - OIF highlighted the danger of planning for "swift" 30-day defeats against irregular foes, as well as the debilitating deficiencies in post-war planning associated with this line of thinking
  - Under any circumstances, the high added costs associated with dramatically improved strategic must be carefully weighed against the expected benefits, especially in light of future budget forecasts

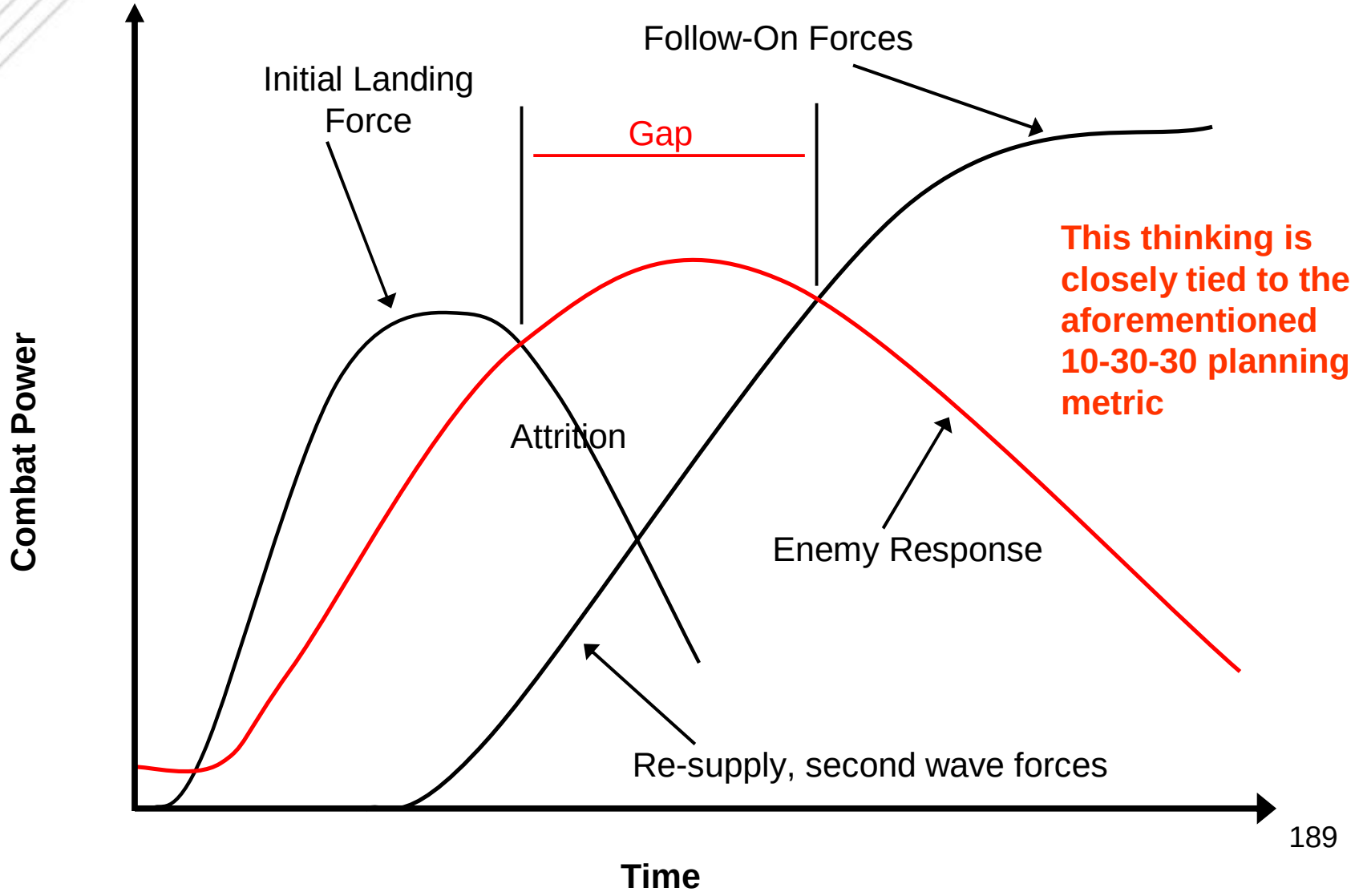
- And in this regard, it is important to note that the so-called "vulnerability gap" that the DoN Sea Base plan is purportedly designed to address is an artifact of the pre-Guided Weapons Warfare Regime

The DoN (and DSB) Justification for a New Sea Basing Requirement is the Perceived Need to Close the 'Vulnerability Gap" Associated With Landings From the Sea



This chart was introduced in the DSB Task Force Study on Sea Basing

The "Vulnerability Gap" Results From a Supposed Net Force Disadvantage in Building Up Combat Power Ashore From the Sea



There's Just One Problem: These Graphs Are Based on an Analysis of Landings Made in the First Expeditionary Era, *in the Pre-Guided Warfare Weapons Regime*

- These graphs are therefore hopelessly dated. It is not at all clear the graphs even reflect events at the end of the first Expeditionary Era or in the early years of the Garrison Era
  - In the Pacific, the Japanese island defenders perceived no vulnerability gap at all. Indeed, their failure to stop the momentum of US landing forces across a beach gradually convinced them to moved their defenses inland
  - In the European Theater, due to US air superiority, the Germans were unable to move against the Normandy beachhead. They had to content themselves with holding defensive positions in hedgerow country for as long as possible to delay the anticipated allied breakout from their force lodgment
  - In the Korean War, the graphs do not accurately portray the idea of landing a mobile force through a lightly defended littoral penetration point, such as Inchon

- Under any circumstances, the graphs definitely do not portray circumstances today, where any general movement of enemy operational reserves against a Joint lodgment would trigger an immediate and sustained guided weapons counter-maneuver bombardment

- In summary, then, the requirement to sea base the far bulkier Marine ACE, the perceived Marine preference for aerial maneuver over surface maneuver, the pursuit of selective offload capabilities, the desired improved-at sea assembly capabilities envisioned in MPF 2010, and the perceived need for dramatically increased strategic closure timelines came together in the October 2002 version of *Seapower 21,* in the form of Sea Basing

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All Ahead Flank:
Steaming Toward a New Maneuver Sea Base

- *Seapower 21* and its concept of Sea Basing initiated a frenzied DoN review of plans for its future "Sea as Base" Maneuver Fleet
  - As discussed, the current plan reflects a blending of the DoN's Landing and Maritime Prepositioning Fleets to form a new fleet that is capable of more rapid strategic response

- To review, the combined Landing and Maritime Prepositioning Fleets consist of 35 amphibious ships, 16 MPF(E) ships, and two T-AVBs, for a total of 53 DoN maneuver sea base platforms (these numbers do not include Army and Joint prepositioning ships)
  - The 35 amphibious landing force ships, designed specifically for forcible entry operations, carry slightly over 2.5 MEB equivalents, except in the footprint metric of vehicle square (exacerbated by unconstrained growth in Marine equipment)
  - The 16 MPF(E) ships, designed for unimpeded/guarded access scenarios, carry the equipment sets and 30 days sustainment for 3.0 MEBs
  - Pre-sea basing plans were to build a sea–based maneuver force capable of lifting 5.5 total MEB equivalents (2.5 on amphibious lift; 3.0 on MPF lift)

- The oldest ships in the fleet belong to the 11-ship LPD-4 class, commissioned between 1965-1971
  - These *steam-powered* ships are now being replaced by new *diesel-powered* LPD-17s, the first to be commissioned in 2005
  - Pre-sea basing plans called for a class of 12 LPD-17s, which would enable the fleet to carry the required 2.5 MEB equivalents in vehicle square

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All Ahead Flank:
Steaming Toward a New Maneuver Sea Base (2)

- The next oldest ships in the fleet are the five large *steam-powered* ships of the LHA class, commissioned between 1976 and 1980
  - The first LHA is being replaced by the *gas-turbine powered* LHD-8; pre-sea basing plans were to replace the remaining four with the aforementioned *gas-turbine powered* LHA(R)

- The 12 *diesel-powered* LSDs in the force (LSD41/49s) were commissioned between 1985-1998
  - Although a relatively young class of ships, they have been inadequately maintained, and are becoming increasingly expensive to operate

- The seven newest amphibious ships are members of the *steam-powered* LHD class, the oldest of which was commissioned in 1989
  - As mentioned, the eighth and final planned ship of the class, LHD-8, will have a *gas turbine* propulsion plant
  - Pre-sea basing plans called for a force of 12 big-deck amphibious assault ships, consisting of a mixture of LHAs, LHDs, and LHA(R)s

- The emphasis on class propulsion plants is important; the Navy desires to remove all remaining steam-powered ships from the TFBN as soon as possible, with more economical and easier to maintain diesel plants or gas turbine propulsion plants

- These 35 amphibious assault ships carry among them an aggregate crews of approximately 21,660 officers and Sailors

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All Ahead Flank:
Steaming Toward a New Maneuver Sea Base (3)

- The three MPF (Enhanced) squadrons are composed of a combination of new construction and converted commercial ships
  - These ships are leased, and are operated by civilian mariners employed by the MSC
  - The three squadron leases expire between 2009-2011
  - Current plans are to buy out the leases; at that time the ships are projected to have a minimum of 25 years service life left

- The new Sea Basing plan, as implied in the FY 2006 Budget and revealed through interviews with DoN officials, calls for the LPD-17 program to be truncated after nine ships, with the last ship to be authorized in FY 2007. Over the mid-term, the amphibious fleet would apparently decline to 27 ships—9 LHDs/LHA(R)s; 9 LPD-17s; and 9 LSDs—organized into nine, 3-ship Expeditionary Strike Groups, or ESGs
  - This force would carry approximately 2.0 MEB lift, but would fall short in vehicle square (1.75 MEB equivalents)

- The MPF 2010 concept would be expressed in a new Maritime Prepositioning Force Future (MPF(F)) plan: starting in FY 2009, two of the MPF(E) squadrons would begin to transition to the new MPF(F) sea basing configuration
  - Notional plans call for two squadrons of nine ships each: 8 new MPF(F) ships, and one MPF(E) legacy ship (these plans are in constant flux)
    - Importantly, each MPF(F) ship would have facilities to support the MV-22, and MPF(F) ships would become the primary means to sea base
    - Also, MPF(F) ships would be able to selectively offload their cargo
  - As MPF(F) squadrons are stood up, the unused MPF(E) ships would revert to the common user sealift pool; a total of nine ships are expected to transfer

All Ahead Flank:
Steaming Toward a New Maneuver Sea Base (4)

  - Over time, the MPF(F) ships would also to replace the LSDs, which would be retired
    - The amphibious landing fleet would thus shrink to 18 ships, organized into nine, 2-ship ESGs
    - These ESGs would be augmented by a single MPF(F) ship when deployed

- The third MPF(E) squadron will be retained (assume five ships total)
  - No replacement plans for the two T-AVBs have been announced

- Target cost for an MPF(F) ship was recently set by the CNO to be $1.5 billion, or slightly over one average ship equivalent
  - The FY 2006 budget plan indicates that the first ship will be built in 2009, and that in FY 2012 the number of MPF ships built per year will climb to two ships
  - Given a shipbuilding budget of approximately $10 billion a year, this plan appears to be overly optimistic
    - A more realistic plan of one MPF(F) per year would mean the fleet transition would take until 2027, approximately 15-16 years after the delivery of the first MPF(F) ship, projected for FY 2011

- Notional target cost for the two MPF(F) squadron transitions: $24 billion, plus the cost of the MPF(E) lease buy-out
  - Significantly, the substantial costs associated with the sea base connectors—required to give the sea base any meaningful operational capability—are not included in these costs

All Ahead Flank:
Steaming Toward a New Maneuver Sea Base (5)

- In summary, when the sea basing transition plan is complete, the new "Sea as Base" Maneuver Fleet will consist of approximately 41 large sea base maneuver platforms, lifting approximately 4.75 MEB equivalents, carried on:
  - An amphibious landing fleet of 18 ships organized into nine, 2-ship ESGs, (9 LHD/LHAR; 9 LPD-17), capable of lifting approximately 1.75 MEB equivalents (approximately 1.42 equivalents in vehicle square)
  - Two, 9-ship MPF(F) squadrons, each capable of supporting a sea-based MEB
  - One, 5-ship MPF(E) squadron, capable of carrying a MEB equipment set

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Sea Basing: The Tipping Point

- The primary operational justification used for the DoN Sea Basing plan is to improve the strategic speed of response for sea-based maneuver forces—"to get twice as many Marines to a conflict twice as fast"—and to allow for the selective offload of equipment
  - The DoN can currently assemble and position a 8,200-strong Marine Expeditionary Brigade anywhere in the world in just less than 30 days
  - Because of the "10-30-30" planning metric, the new DoN "stretch goal" is to assemble a 8,200-strong Marine Expeditionary Brigade anywhere in the world within 10-14 days, and to employ and sustain it completely from a sea base

- However, it is clear that very important practical considerations also greatly influenced the development of the DoN Sea Basing plan:
  - As discussed, the fleet of L-class ships needed to carry the MV-22s and JSFs required for JFEO operations was unaffordable
    - Basing MV-22s on commercial MPF ships was perceived to be a cheaper way to base the MV-22s at sea
  - With the cost of the first LPD-17 spiraling out of control in the 2001-2002 timeframe, Navy officials initially thought MPF(F) ships built to enhanced commercial standards could save on ship procurement costs
    - This hope was later dashed; MPF(F) ships are now expected to cost more than a LPD-17
  - The plan would lead to a more rapid removal of steam plants from the fleet
    - With the retirement of the carriers *Kitty Hawk* and *JFK*, the LHAs and first seven LHDs would be the only warships in the TFBN with steam propulsion plants
  - ***Most importantly, however, the plan promised important long-term manpower savings, by substituting civilian-crewed MPF(F) ships for some 18 Navy-crewed amphibious assault ships***

Sea Basing: The Tipping Point (2)

  - The current force of five LHAs, seven LHDs, 11 LPD-4s, eight LSD-41s, and four LSD-49s require a combined crew of 21,345 officers and Sailors
  - In comparison, the DoN Sea Basing plan for nine LHD/LHARs and nine LPD-17s, augmented by two MPF(F) squadrons and one MPF(E) squadron, requires approximately 13,400 active duty officers and Sailors, representing a savings of 7,945 active duty billets
- Note that all of these reasons put MPF(F) ships in direct competition with amphibious assault shipping

- Moreover, without question, the Sea Basing concept has many supporters, both inside and outside the DoN, inside and outside the Navy, and inside and outside the Marine Corps:
  - The CNO and some OSD and Joint planners focus on the need for improved force closure, as required by the "10-30-30 " planning metric
  - Marine aviation continues to fight hard to get the platforms necessary to sea base their much more capable, but much larger, V-22s and JSFs
  - Marine logisticians, motivated by the desire to improve their MAGTF support capabilities, support the new selective offload capabilities of MPF(F) ships
  - And, as discussed, many in OSD and the DoN apparently consider MPF(F) ships to be "transformational," and amphibious assault shipping and their associated well decks to be an artifact of a long-passed strategic era

The Planned Reductions to the "Sea as Base" Maneuver Fleet Stands in Stark Contrast to Plans For Other TFBN Components

- The submarine fleet will eventually fall from the current level of 54 boats to some number below 50, but the reduction will be a gradual one over the next one-and-a-half decades, and the final long-term steady state submarine fleet is uncertain, at best
  - Much will depend upon the success of designing a cheaper submarine (to be discussed), and whether or not UUVs can substitute in some instances for an SSN
- As indicated in the recent FY 2006 budget submission, the carrier force is expected to drop by one ship, from 12 to 11—an 8% reduction
  - But the increased striking power found on the remaining ships more than makes up for its loss
- The surface "battle line" is scheduled to *increase* from 71 to 84-93 ships, depending on the final DDX production run—a 18-32% force *increase*
- As will be discussed, plans call for the replacement of 30 FF7s, 26 mine warfare ships, and 13 PCs with 40-80 Littoral Combat Ships, depending on the ship crewing scheme. This will represent somewhere between a 42% force reduction or a 19% force increase in "small" TFBN combatants
  - However, the LCS's modularity will *increase* the overall effectiveness of the small combatant force even if the total force numbers decrease
- In contrast, the planned reduction in the maneuver sea base fleet from 53 to 41 ships represents a reduction of 23%
  - The reductions are disproportionately concentrated in the amphibious assault fleet; the pre-sea basing plans for 36 amphibious ships have been halved to 18 ships
  - Moreover, this force reduction represents a 14% real decrease in the maneuver fleet's overall lift capacity, from 5.5 MEB to 4.75 MEB equivalents

Do the Planned Reductions in the "Sea as Base" Maneuver Fleet Make Sense in Light of Forecasts for the Joint Expeditionary Era?

- The answer to this over-arching query would be revealed by the answers to the following four key questions:
  - **First, in an era of uncertain access, does it make sense to reduce for naval planners to reduce the size of the TFBN's amphibious landing force?**

Assumption: An Enduring Requirement For a "Sea as Base" Power Projection Fleet is to be Able to Create Access Where it is Not—to Forcibly Seize a Joint Lodgment

- Although the US counts on the sea as base, it still must be prepared to force its way into an adversary's defended battle space:

  "Forcible entry is seizing and holding a military lodgment in the face of armed opposition. A lodgment is a designated area in a hostile or potentially hostile territory that, when seized and held, makes the continuous landing of troops and material possible and provides maneuver space for subsequent operations (a lodgment may be an airhead, a beachhead, or a combination thereof). A lodgment may have established facilities and infrastructure (such as those found at international air and sea ports) or may simply have an undeveloped landing strip, an austere drop zone, or an obscure assault beach."

  Joint Publication 3-18: Joint Forcible Entry Operations

- The US force structure dedicated to the Joint Forcible Entry Operations mission dropped during the Garrison Era as the requirement for forcible entry disappeared
  - Out of a total planned future brigade force structure of 91 brigades (not counting special operations forces), less than nine will be optimized for creating a Joint lodgment inside an enemy's defended battle space (six airborne UAs; 2.5 Marine Expeditionary Brigades configured for amphibious landings)

- The DoN Sea Basing plan purportedly increases the number of MEB equivalents optimized for JFEO operations to 3.75
  - However, 2.0 MEB equivalents are to be carried on commercially-designed MPF ships with no onboard terminal defenses and small MSC crews capable of performing only rudimentary damage control operations

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Amphibious Landing Ships: *Quo Vadis*?

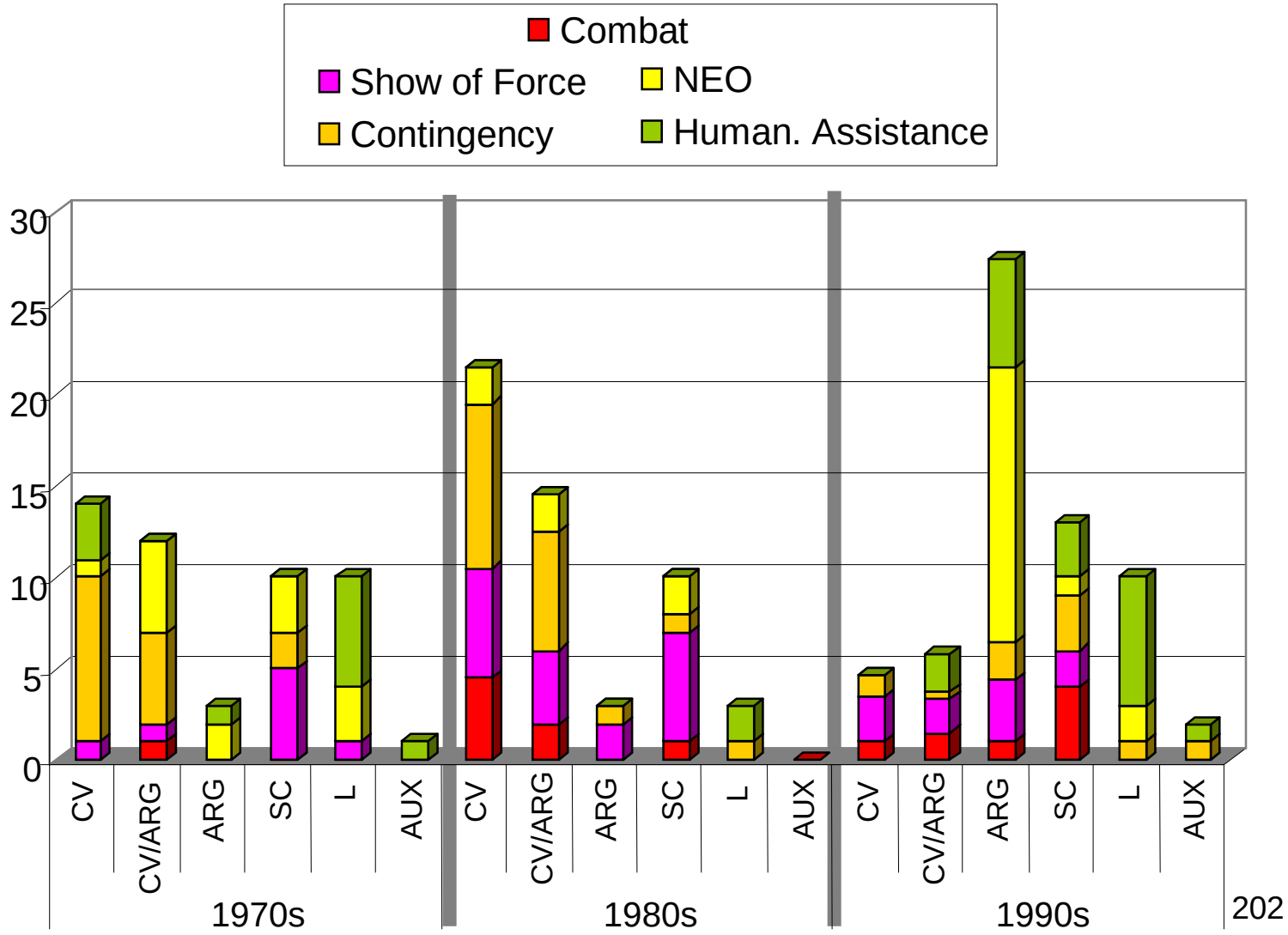
- An underlying premise of the current Sea Basing plan thus appears to be that amphibious assault shipping will not be as relevant in the future as in the past, or that MPF(F) ships can easily substitute for them

- It is easy to forget that the amphibious revolution occurred right alongside of the carrier revolution; it, too, is only about six decades old
  - One historian has argued that the LST was the single most important naval craft in World War II; another argued that the LCVP claimed the same honor
  - The LSD has also been highlighted as a "transformational" WWII ship

- As previously discussed, the premise that amphibious assault shipping was losing its relevance was demonstrably true during the Garrison Era: after Inchon, aside from small landing party operations conducted from MAU/MEUs, the Marines landed brigade-size units only three times during the Garrison Era, all in unopposed or administrative landings (Lebanon, 1958; Dominican Republic, 1965; Vietnam, 1965)

- However, since the start of the Join Expeditionary Era in 1989:
  - The DoN was prepared to conduct a two-brigade amphibious assault during Desert Storm (the largest operational amphibious force assembled since Inchon);
  - During Desert Storm, Naval Battle Forces conducted several small amphibious raids on offshore islands from amphibious assault shipping;
  - Marines on forward deployed amphibious ships were landed in in Albania in support of Operation Allied Force;
  - TF 58, based on forward-deployed amphibious ships, projected the first major conventional combat units into Afghanistan during OEF;
  - Marine amphibious forces made important contributions during OIF

Moreover, Compared to the Garrison Era, Forward Deployed Amphibious Ships Have Proven To Be Very Useful Tools in the Joint Expeditionary Era



Source: CNA

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Amphibious Landing Shipping: No Longer Relevant?

- Interestingly, the evident *increasing* operational use of amphibious landing shipping in the Joint Expeditionary Era is used to justify the need to improve the "Sea as Base" Maneuver Fleet, but not to retain the specialized ship-to-shore capabilities found on amphibious landing ships
  - As discussed, this reflects an apparent bias for aerial maneuver by the Marines, and a need to improve strategic closure times within the DoN and DoD
  - In a broader sense, however, it also reflects a bias against amphibious operations, amphibious landing shipping, and surface assault capability on the OSD, Joint, DoN, DoN staffs
    - This is not surprising. The number of Marines who have planned an amphibious operation greater than battalion size probably numbers less than 200, and the number of amphibious Admirals in the Navy would not use up the fingers on one hand

- Thus, it is helpful to remember that the current disrepair of the fleet's amphibious landing capability owes less to the obsolescence of amphibious warfare *per se,* and more to its lack of operational utility in the recently passed Garrison Era
  - Justifying the drawdown of the amphibious landing fleet with observations like "The fleet has not conducted a major amphibious operation since Inchon" is ridiculous: no US submarine has fired a torpedo in anger since 1945; should TFBN planners thus conclude that ASW is no longer a relevant mission for the SSN force?

- It is the expectation of *future utility* that should determine the size and capabilities of the future amphibious landing fleet, not its lack of utility in the Garrison Era

Interestingly, While the US Is Reducing the Size of Its Amphibious Landing Fleet, Allied Navies Are Increasing Theirs

- For allied navies, whose interest in "out of area" expeditionary power projection operations have also increased since the end of the Garrison Era, and who are forced to develop fiscally realistic plans as a matter of course, there has been a renaissance in amphibious warfare capabilities, reflected by new classes of amphibious landing platforms, among them:
  - A planned Australian LHD: 25,000-27,000 tons FLD; full-length flight deck; 6 helo spots; well deck
  - The French *Mistral* LHD: 21,500 tons FLD; full-length flight deck; well deck
  - The Spanish Strategic Projection Ship (LHD): 27,062 tons FLD; full length flight deck; well deck
  - The planned Canadian Joint Support Ship: 28,000 tons FLD; helo deck; well deck
  - The Netherlands and Spanish *Rotterdam* LPD: 16,880 tons FLD; flight deck; well deck
  - The British *Albion* LPD: 18,500 tons FLD; flight deck; well deck

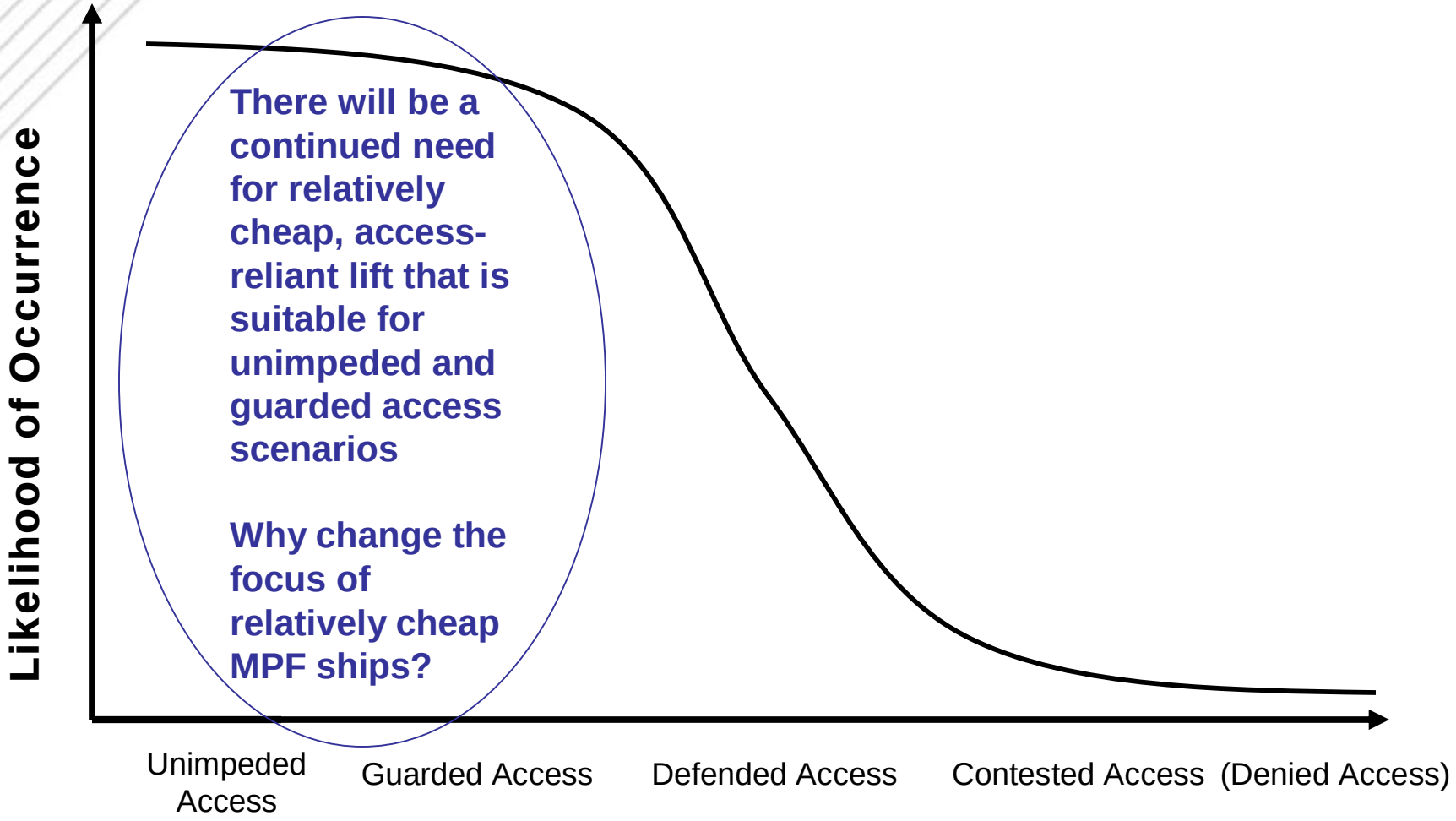
- Significantly, these navies are often giving up surface combatants and submarines to assemble these new amphibious warfare capabilities

- It is true that these ships are often built to commercial standards because of cost considerations. Importantly, however, they are ***not*** designed for operations in a defended littoral; they are instead designed for the effective transport of combat units over transoceanic distances and the efficient ship-to-shore transfer of personnel, vehicles, and equipment once there
  - And as can be seen, **LHDs** and **LPD** are the platforms of choice, as they have proven, effective air and surface connector interfaces (i.e., flight decks and well decks)

Do the Planned Reductions in the Maneuver Sea Base Fleet Make Sense in Light of Forecasts for the Joint Expeditionary Era?

- The answer to this over-arching query would be revealed by the answers to the following four key questions:
  - In an era of uncertain access, does it make sense to reduce for naval planners to reduce the size of the TFBN's amphibious landing force?
  - **Second, Does it make sense to reduce the number of relatively cheap, access-reliant maneuver sea base platforms when most GWOT-related ground combat operations will occur in unimpeded and guarded access scenarios?**

The Previous Discussions About Challenger/Access Combinations Suggests an Enduring US Need For a Cost-Effective Mix of Maneuver Sea Base Platforms



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  - Does it make sense to reduce the number of relatively cheap, access-reliant maneuver sea base platforms when most GWOT-related ground combat operations will occur in unimpeded and guarded access scenarios?
  - **Third, and more fundamentally, in an era of uncertain access where there may be potential traditional and disruptive catastrophic power projection challenges in defended access scenarios, does it make sense for the TFBN planners to try to convert access-dependent, commercially-designed MPF ships into JFEO platforms rather than retaining amphibious landing ships specifically designed for these scenarios?**
    - Where are the force protection/risk assessments that support such moves?

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A Question About Risk

- The official DoN response to the question of risk appears to be that:
  - Although commercially designed and civilian crewed MPF(F) ships will have no onboard terminal defenses, they will be protected by the "Sea Shield" provided by TFBN defenses
  - Large commercial ships and amphibious warships have equivalent toughness
    - *When their well decks are open,* amphibious warships will sink if one compartment is flooded, and the Navy has long accepted a one-compartment flooding standard in its submarine designs
    - Commercial ships have one compartment (or better) flooding standards for survivability
  - In any event, if the price paid for selective offloading of equipment and supplies from the maneuver sea base platform is increased risk in the survivability of "Sea as Base" maneuver ship, the benefits outweigh the risks

- These arguments simply do not hold water:
  - First, a nuclear-powered attack submarine is not a part of the Sea as Base Power Projection Fleet; it is a *defender* of the sea base
    - In any event, it has a high degree of stealth and hardening; it is much harder to find than a large warship operating within 100 miles of a defended shoreline, and much harder to kill
  - Comparing flooding criteria between a submarine and a sea base maneuver platform is not a valid comparison
    - In any event, taking this logic to its inevitable conclusion, the DoN should also build aircraft carriers and surface combatants to commercial survivability and one compartment flooding standards, and rely on TFBN defenses to protect them

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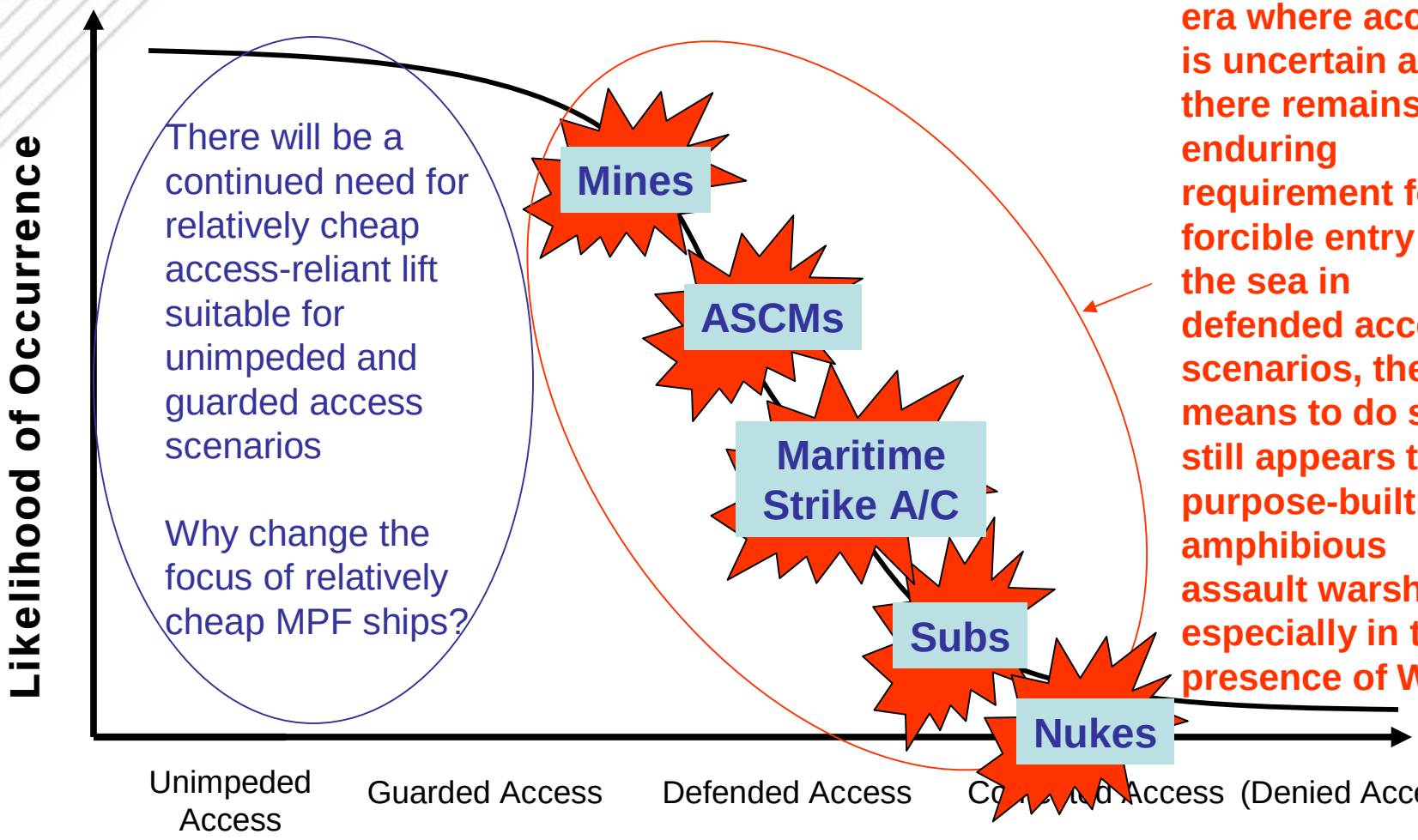
A Question About Risk (2)

- Second, it appears intuitively obvious that all three major components of a power projection sea base designed for sustained operations in a defended littoral—aviation power projection ships, amphibious warships, and surface combatants—should have terminal defenses and as high a degree of damage control consistent with an affordable ship design
  - Mixing warships and commercial ships in a defended littoral entails great risks
  - The fate of the commercially-designed *Atlantic Conveyor* during the Royal Navy's 1982 venture into a littoral defended by the Argentinean Armed Forces provides a cautionary tail about mixing warships and commercial ships, and relying on a Sea Shield for individual ship protection
    - » During an attack by Argentinean maritime strike aircraft, all of the warships in the task group activated their electronic counter-measures and terminal defenses; two incoming Exocet missiles diverted and locked onto the large *Atlantic Conveyor*, and sent her to the bottom
  - Maneuver sea base platforms carry more personnel and equipment than any TFBN platform with the exception of aviation power projection platforms; operating them in a defended littoral with no onboard terminal defenses appears to be both wrong and risky
- Finally, if the requirement to selectively offload cargo and supplies puts Marines at risk, approach the problem in a different way: separate the primary people and equipment carriers from the primary cargo carriers
  - This was the approach taken in the first Expeditionary Era, when specialized personnel transports and specialized cargo transports were developed

A "Sea as Base" Power Projection Fleet Demands That *All* of Its Major Components Be Designed For Operations in a Defended Littoral



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Do the Planned Reductions in the Maneuver Sea Base Fleet Make Sense in Light of Forecasts for the Joint Expeditionary Era?

- The answer to this over-arching query would be revealed by the answers to the following four key questions:
  - In an era of uncertain access, does it make sense to reduce for naval planners to reduce the size of the TFBN's amphibious landing force?
  - Does it make sense to reduce the number of relatively cheap, access-reliant maneuver sea base platforms when most GWOT-related ground combat operations will occur in unimpeded and guarded access scenarios?
  - More fundamentally, in an era of uncertain access where there may be potential traditional and disruptive catastrophic power projection challenges in defended access scenarios, does it make sense for the TFBN planners to try to convert access-dependent, commercially-designed MPF ships into JFEO platforms rather than retaining amphibious landing ships specifically designed for these scenarios?
    - Where are the force protection/risk assessments that support such moves?
  - **Finally, given the enormous uncertainties surrounding MPF(F) ships, their connector interfaces, and their connectors, does it make sense to pursue these ships in absence of observable experimental results?**

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The Need For Experimentation

- The DoN's Sea Basing vision is an audacious one, and one that should be pursued
  - However, the desired requirements to assemble large maneuver units on sea bases anywhere in the world in 10-14 days; to project these units up to 200 miles inland from distances as far as 100 miles offshore; to sustain the forces using automated selective offload techniques and high speed connectors; and to conduct underway replenishment of sea base *cargo*—all in Sea state 4—is a tremendously challenging proposition
  - The hard work necessary to design suitable fleet aviation power projection platforms during the Interwar years in the first Expeditionary Era looks relatively simple in comparison
    - This work extended over two decades, and required the building of numerous operational prototypes and the conduct of continual fleet experimentation

- For this reason, the DSB recommended the formation of a Joint Program Office for Sea Basing, and the initiation of a spiral development program ***based on the results of Joint experimentation***
  - In contrast, the DoN appears to be moving forward informed by little more than paper studies and a small number of modest, limited objective experiments
    - Is the DoN so certain that the DSB's "Dirty Dozen" can be solved?

- Moreover, what are the Joint tasks, capabilities, and standards for the future maneuver sea base?
  - Is it smart to make major DoN programmatic decisions before the Joint requirements are known?
  - Relying on "spiral development" is a fool's game if the underlying concept proves to be faulty

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The Need For Experimentation (2)

- A key focus of experimentation should be what types of affordable capabilities can be designed into large, commercially designed MPF(F)/sea basing ships
  - The work done thus far on sea basing is intriguing, but neither the concept nor the supporting technologies appear sufficiently mature to justify any near-term decisions such as canceling the LPD-17 in favor of MPF(F) ships, or removing the well deck from the big deck amphibious assault platforms, both of which would severely curtail the TFBN's ability to launch surface assaults over the longer term

- Given these large uncertainties, no major moves toward the sea basing vision should be made without further exploring the sea basing concept itself, and experimenting with different numbers and types of sea base platforms, connectors, and capabilities
  - As the DSB concluded, the Joint Sea as Base Maneuver Force represents a system of systems that requires serious experimentation and study before pursuing any given approach
  - The decision to delay the first award for the MPF(F) ship to FY 2009 is an encouraging sign that the DoN has recognized the need to slow down and more fully examine all of the issues surrounding the creation of a true sea basing capability
  - DoN should cast the widest net possible for ideas
    - Lockheed Martin, General Dynamics, and Northrop Grumman all have plausible approaches for a newly designed sea basing facility

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Additional Observations/Judgments

- The DSB report on sea basing argues for a capability to assemble a sea base 100 miles from shore, and to be able to operate from the base in sea state four. The connectors to support these operational conditions are non-existent
  - Any near-to-mid-term forcible entry operation will require the sea base to operate much closer to the beach; this argues for warships designed to fight and survive closer to the shore
  - Potential operations against a nuclear- or WMD-armed adversary also suggest that at least some sea-based maneuver forces must be able to operate in a “dirty” or contaminated environment

- The Guided Warfare Revolution has simultaneously increased the risks for deep aerial maneuver operations, and increased the value of rapidly moving combined arms columns operating across a wide front and screened by airpower
  - This circumstance argues for retaining a viable surface assault capability in the maneuver sea base

- Rotationally deployed amphibious landing ships that are capable of operating in defended access scenarios are attractive TFBN assets because they:
  - Afford the embarked Sailors and Marines increased protection against irregular surprise attacks; and
  - Allow immediate transition to advance force maneuver operations in surprise defended access scenarios

All three of these observations point toward the enduring usefulness of amphibious landing ships designed for operations in a defended littoral

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Additional Observations/Judgments (2)

- Strategic speed against irregular enemies, in defended littorals, or against nuclear-armed adversaries appears to be far less relevant than it is for two near-simultaneous "swift defeat" operations
  - Operations against adversaries with nuclear weapons and with high-end A2/AD networks will likely be deliberate, with a long period of Joint advance force and shaping operations, followed by concerted roll-back operations
  - With the exception of striking/seizing a high value, fleeting terrorist target, operations against irregular adversaries will normally occur in unimpeded and guarded access scenarios, and a delay of days in a US response is not likely to be strategically significant
  - There are two plausible DoN scenarios in which speed of response appears to be absolutely critical
    - One—the defense of Taiwan—will not likely involve a maneuver sea base
    - The second--counter-invasion operations on the Korean peninsula—can be handled in a variety of different ways from bases and sea-based force located in the theater

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What's the Rush?

- The haste apparent in the DoN Sea Basing plan suggests that DoN leadership believes it cannot wait for the results of Joint experimentation

- Interviews suggest that there are three driving factors behind the DoN's haste:
  - First, the previously described "grand fissure" that occurred between the Navy and Marines during the Garrison Era is prompting the Navy to "offload" Marine landing forces onto civilian-manned MSC ships
    - From a DoN perspective, the gradual operational divergence of the Navy and Marines that occurred during the Garrison Era was regrettable, but perfectly understandable given the particular circumstances of the Era
    - However, as has been previously argued, DoN TFBN operations in the Joint Expeditionary Era will be immeasurably more effective if the Navy and Marines can rebuild the strong operational linkages so evident during the Frigate and first Expeditionary Eras
    - Further reducing the number of platforms on which Marines and Sailors fight side-by-side will likely make the process of building these linkages harder
  - Second, there appears to be a widespread belief than the requirement to forcibly seize a Joint lodgment from the sea has such a low probability that shifting to commercially designed maneuver sea base platforms in order to save money is worth the associated risk
    - A counter-argument could be made that an amphibious landing fleet capable of lifting only 2.5 brigade equivalents out of a brigade-based force structure of 91 brigades already reflects a large acceptance of risk
  - Third, there appears to be a common assumption that only a "Sea as Base" Maneuver Fleet built around commercially designed and civilian manned MPF(F) ships can be both strategically responsive and affordable
    - As will be shown, this assumption is simply not true

"Turn Around and Face the Problem"**

** On the Leadership Reaction Course at the Marine Corps' Officer Candidate School, an Officer Candidate, with his back to the evaluation station, is told what task he or she must accomplish in a ten minute period (e.g., evacuate a casualty across a stream). After this briefing, Candidates are instructed to "turn around and face the problem," giving them their first look of the situation and the tools they have to work with. The course is designed to teach Candidates to make rapid assessment of the situation, and to execute a hasty plan

The current problem: ***transform the existing "Sea as Base" Maneuver Fleet***:

Amphibious Landing Fleet	2.5 MEB defended access lift; 20-22 kt speed of advance (SOA)
Maritime Prepositioning Fleet	
• Maritime Prepositioning Force:	3.0 MEB unimpeded/guarded access lift; 20-22 kt SOA
• Combat Prepositioning Force:	1.0 Army heavy UA unimpeded/guarded access lift; 20-24 kt SOA
• Logistics Prepositioning Force	
DLA	Air Force Afloat Prepositioned Stocks
	Offshore Petroleum Distribution Systems
USMC	2 T-AVBs
Surge Sealift Fleet	
• Fast Surge Sealift Force	4.0 Army heavy UA lift; 30+kt SOA
• Medium Speed Sealift Force	11.0 Army heavy UA lift; 24-25 kt SOA

Here Are Some Available Joint Tools

These following reflect the planned improvements to Joint "sea as base" capabilities

- Combat Prepositioning Force:
  - **3.0** Army heavy UA unimpeded/guarded access lift; 20-24 kt SOA
  - Three squadrons, each carrying one 1x1 heavy UA, located in the Mediterranean; Diego Garcia; and Guam
  - **1.0** Army AFSB, carrying one Air Assault UA
- Logistics Prepositioning Force
  - DLA: DLA **Afloat** Distribution Center; **Offshore** Petroleum Distribution Systems
  - Air Force: Air Force **Afloat** Propositioned Stocks
  - Army: Army Supply Support Activity **Afloat**
- Fast Surge Sealift Fleet
  - 4.0 Army heavy UA lift; 30+kt SOA
  - **Austere Access Shallow Draft Ships (AASDSs)?**
- Medium Speed Sealift Fleet
  - 11.0 Army heavy UA lift; 24-25 kt SOA
- **Fast Intra-theater Sealift**
  - **?** Brigade equivalent lifts on **Joint High Speed Vessels (JHSVs)**

Rapid Assessment of the Situation

- Combat Prepositioning Force:

  3.0 Army heavy UA unimpeded/guarded access lift; 20-24 kt SOA
  Three squadrons, each carrying one 1x1 heavy UA, located in the Mediterranean; Diego Garcia; and Guam
  1.0 Army AFSB, carrying one Air Assault UA

The Army's planned CPF duplicates the 4.0 brigade equivalent lift of the entire Maritime Prepositioning Fleet, and starts the move toward sea basing

- Logistics Prepositioning Force
  DLA

  DLA **Afloat** Distribution Center
  Offshore Petroleum Distribution S
  Air Force **Afloat** Prepositioning
  Army Supply Support Activity **Afloat**

A move toward more afloat distribution centers suggests the need for a common selective offload cargo ship

There is a pressing need to decouple the surge sealift fleet from deepwater ports

- Fast Surge Sealift Fleet

  4.0 Army heavy UA lift; 30+kt SOA
  Austere Access Shallow Draft Ships (AASDSs)?

- Medium Speed Sealift Fleet

  11.0 Army heavy UA lift; 24-25 kt SOA

- **Fast Intra-theater Sealift**

  ? Brigade equivalent lifts on **Joint High Speed Vessels (JHSVs)**

The reappearance of intra-theater connectors that can keep up with the maneuver sea base opens enormous opportunities

This Rapid Assessment Points Out Plausible New DoN Contributions to the Joint "Sea as Base" Maneuver Fleet

- As Samuel Huntington would undoubtedly observe, the oceans are once again a virtual US base; the platforms the DoN chooses to pursue are far less important than the idea of exploiting the global sea base to achieve operationally significant advantages
  - Expanding the capabilities of the ***Joint "Sea as Base" Maneuver Fleet*** is an important goal in the Joint Expeditionary Era

- Working back from a forward littoral, the Joint "Sea as Base" Maneuver Fleet will still require a "kick in the door" force to fight through a defended/contested littoral
  - As suggested by Battle Force operations in the first Expeditionary Era, in an era of uncertain access a key ***DoN*** requirement will be to develop and maintain a viable sea-based forcible entry capability—the job of an amphibious landing force
  - Moreover, any major combat operation for the foreseeable future will still require the seizure of an APOD/SPOD to allow the introduction of follow-on Joint forces
    - And as demonstrated during the first Expeditionary Era, seizing an APOD/SPOD is a JFEO mission tailor-made for airborne and sea-based maneuver forces operating off of amphibious landing ships
  - A force that can lift and support approximately 3.0 brigades in defended access scenarios--only 3.5% of the Joint brigade based force structure—appears to be more than sufficient given forecasts of future access conditions
    - This force would allow the relatively rapid assembly of an amphibious landing force capable of supporting a two brigade attack
    - A two brigade force provides the capability to conduct a rapid seizure of a relatively large lodgment area, or an envelopment of a littoral penetration point

This Rapid Assessment Points Out Plausible New DoN Contributions to the Joint "Sea as Base" Maneuver Fleet (2)

- The Army's CPF essentially copies the Marine Corps Maritime Prepositioning Force, down to the location of its squadrons and its emphasis on heavy maneuver capabilities. This suggests three different but complementary directions for the future MPF:
  - Start to reconfigure the equipment stored on some of the squadrons for GWOT/stability-related tasks (e.g., armored HMMWVs, transport trucks, heavy engineer equipment, etc) to provide equipment set more suitable for these types of operations
  - Start to distribute some of the MPF force so as to provide greater coverage throughout the GWOT central theater and in adjoining maritime theaters
    - In the GWOT, the requirement to defend against insurgent attempts to expand their operations outside of the GWOT central theater argues for more distributed prepositioning of forces and more forward-deployed naval combined arms (strike and maneuver) packages
      - Should the DoN re-establish forward squadron stations?
  - Start to convert some of the MPF squadrons to a sea basing configuration, ***focused on unimpeded/guarded access scenarios***
    - Commercially designed and civilian manned ships are quite suitable for these scenarios

- The reappearance of intra-theater surface connectors capable of keeping up with a surging Naval Battle Network opens a wide variety of possibilities long since lost to the DoN
  - For example, intra-theater surface connectors that can beach themselves would open entirely new (old) ways to conduct distributed landings

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Derived Requirements for the Future DoN "Sea as Base" Maneuver Fleet

- The future DoN "Sea as Base "Maneuver Fleet is designed for several important Joint tasks required in the near term:
  - Provide distributed coverage of combined arms maneuver capability throughout the GWOT strategic theater and along the maritime boundaries of adjacent theaters
    - Be prepared to conduct independent company and battalion size raids against terrorist targets of opportunity, or to provide combined arms support for a major Joint SOF raid
    - Be prepared to conduct and sustain a prompt counter-sanctuary mission involving two reinforced battalions (e.g., TF 58)
  - Transitioning from the basic GWOT force posture, conduct distributed advance force operations in support of a major Joint power projection operation
  - In support of major Joint power projection operations in a defended littoral :
    - Be prepared to conduct a rapid amphibious seizure of a APOD/SPOD, or the isolation of an advanced enemy base, using two MEBs in a double envelopment to the depths of the enemy's artillery and rocket fires
    - Be prepared to conduct up to a two-MEB amphibious turning movement
    - Be prepared to conduct up to a two-MEB distributed, expanding torrent attack against a regional adversary armed with WMD
  - Be prepared to deploy and sustain a MEF (-) in support of a failed state in the GWOT central theater, or to conduct operations in support of a government fighting a major counter-insurgency against Radical Islamic rebels

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Available DoN Tools

- The eight programmed LHDs remain an excellent assault support platform with both a large flight deck and well deck
  - The ships can carry 42 CH-46 equivalents, and can support all-VTOL air wings in a secondary CVV role, and either three LCAC or two LCU surface ship-to-shore connectors in their well decks
  - The ships carry 1,687 troops, and have a surge capacity of an additional 190 troops
  - The ships have extensive command and medical facilities, including six operating rooms
  - The ships carry a formidable self-defense capability, including:
    - A Shipboard Self Defense System/Quick Rapid Reaction Capability (SSDS/QRRC) sensor suite
    - Two, 8-cell launchers for NATO Sea Sparrow air defense missiles
    - Two, 21-round Rolling Airframe Missile (RAM) launchers and two or three Close-in Weapons Systems (CIWS)
    - SLQ-32A(V)3 Electronic Countermeasures System
    - Nulka decoys and Super Rapid Blooming Offboard Chaff (SRBOC) launchers
    - Three or four 25 mm counter-boat guns, and numerous .50 cal machine guns
  - As previously discussed, the first seven ships of the class have steam propulsion plants; the eighth and final ship of the class, scheduled for delivery in FY 2007, will have a gas turbine plant

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Available DoN Tools (2)

- The LPD-17 represents as big a transformation in amphibious assault ships as that represented by the LST, LSD, and LSV in the first Expeditionary Era; it is the amphibious landing ship equivalent of the DD-21/DDX:
  - The LPD-17 is a true ***war***ship, representing the blending of a surface combatant and an amphibious assault ship; it was carefully designed to operate at the leading edge of a DoN Naval Battle Network, 25 miles off of a defended littoral:
    - Its radar cross section (RCS) is roughly equivalent to a DDG-51
    - It also has a capable self-defense capability, including a SSDS/QRRC sensor suite, two RAM launchers, SLQ-32A(V)3 ECM system, SRBOC, Nulka, Mk46 Mod 1 30mm guns counter-boat guns, and space and weight for 16 VLS cells carrying 64 ESSM (the equivalent of a fifth-rate frigate armament)
    - It has a low-maintenance well deck, and can carry 6+ CH-46 equivalents
    - It is the most survivable amphibious warship ever built, and is designed to operate in nuclear environment
    - *A LPD-17-based surface combatant competed in the DD-21 COEA*
  - Although its introduction has been rocky and plagued by cost over-runs (a common problem with computer-designed ships), the class appears to be well along the learning curve: LPD-23 can be built for approximately $1.3 billion (FY 2005 constant dollars)
    - With a multi-year buy at efficient production rates, future ships likely could be built for approximately $1-1.1 billion a copy, meaning two of these ships could be purchased for approximately .33 times the price of a single notional MPF(F) ship

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Available DoN Tools (3)

  - Moreover, because of its computer design and large amount of internal reconfigurable volume, the LPD-17 is extremely adaptable:
    - Rough order of magnitude studies have been made for LPD-17-derived command ships (JCCXs); hospital ships (AHXs); mine warfare command and support ships (MCSXs); and surface combatants (SC-21s)
    - It can also easily accommodate a 50-foot plug aft of the hanger, giving it additional aviation and surface connector capabilities, if desired

- The current MPF(E) ships have much life left in them
  - The problem is not their speed; the problem is the equipment that they carry
    - The current MPF(E) squadrons carry heavy warfighting equipment optimized for Garrison Era rapid reinforcement operations in conditions of assured access
    - The equipment sets are thus not very suited for the STABO and counter-insurgency operations associated with the GWOT
    - Distributed equipment sets tailored to counter-insurgency and stability operations tasks would likely provide a high payoff over the course of the GWOT
  - ***In other words, in the Garrison Era—when access was assured—the MPF carried the Marine's heavy warfighting forces. Now, in the Joint Expeditionary Era—when access is not assured—it might be prudent for that job to revert back to the Landing Fleet***

- DoN Maritime Prepositioning Force LMSRs and T-AKEs recently designed and built are roomy, relatively speedy (20-25 knots), and can be built at both Avondale and NASSCO ship yards; they appear to be ideally suited as inexpensive replacements for aging MPF(E) ships; variants for future sea-based MPF(F) ships; and even for new selective offload cargo ships

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Available DoN Tools (4)

- As was discussed earlier, the two T-AVBs in the Logistics Prepositioning Force carry the Intermediate Maintenance Activity (IMA) for a Marine Air Combat Element
  - These ships serve very little purpose other than carrying cargo containers
  - Future T-AVBs might be designed along the lines of the aforementioned Army AFSB, providing more functionality for the maneuver sea base
    - For example, two Maersk S-class ship conversions would provide the future maneuver sea base with 144 CH-46 hanger equivalents and 30 operating rotary wing spots
      - This represents the aviation support equivalent of 3.2 LHDs
      - Projected costs for a ship conversion are between $300-500 million, meaning two of these ships could likely be converted for less than $1 billion

- As far as aerial connectors for the sea base:
  - The CH-53X appears to be the best interim choice for a HLVTOL
    - The longer term requirement is for a larger, more capable Joint HLVTOL; however, in this tight budget environment, the services would likely have to free up funds within their own budget toplines to develop it
  - The CH-46 must be replaced as rapidly as possible
    - However, the MV-22 is so expensive and has such a large impact on maneuver sea base platform plans that a replacement for the primary aerial ship-to-objective assault support aircraft should be considered
    - There appear to be three plausible near-term options for replacing the MV-22. These include:

Available DoN Tools (5)

  - Pursuing an all-CH-53X force;
  - Pursuing a CH-53X/CH-60 force;
  - Or pursuing a CH-53X/US-101 force
    - » The US-101 is the helicopter recently chosen for the VMX Presidential support mission
    - » Costs for this aircraft could likely be driven down further if it was also selected to be the USAF Personnel Recovery Vehicle (for combat search and rescue missions)
  - However, the "Sea as Base" Maneuver Fleet must be capable of supporting the MV-22 if the decision is made to retain it

- The future "Sea as Base" Maneuver Fleet will also require numerous high speed surface connectors. There are several promising surface connectors nearing production
  - The DoN High Speed Ship (HSS) and the Army Theater Support Vessel (TSV) programs were recently combined into the Joint High Speed Vessel (JHSV) program
    - This new ship will re-introduce intra-theater connectors into the maneuver sea base platform mix, since it will be capable of keeping up with (or out-speeding) advancing Naval Battle Networks
    - Its projected costs are on the order of $185 million
  - As will be discussed, both Littoral Combat Ship designs will provide the future TFBN with an updated Fast Destroyer Transport (APD) capability: high speed delivery and support of company-sized raiding forces
    - The General Dynamics version has a payload bay that can lift 34 seven-ton trucks or 14 Expeditionary Fighting Vehicles; over 40% of the Lockheed Martin version's internal volume is reconfigurable

Available DoN Tools (6)

  - Both variants can therefore perform an important secondary role as intra-theater high-speed sea base connectors
  - The projected cost of an LCS hull with basic combat systems is $220 million
- The new Titan Sea Fighter (formerly X-Craft), with a nominal cost of “only” $70 million, may also be able to act as a maneuver sea base connector
- For ship-to-shore connectors, an improved LCAC (LCAC(X)) and an improved LCU (LCH(X)) are being pursued
- The EFV is the current ship-to-objective surface connector
  - It has a chemical, biological, and radiological (CBR) overpressure system
- One possible welcome addition to the connector stable would be a high-speed intra-theater connector that could *beach and unload its cargo*, thereby complementing the amphibious landing force during forcible entry operations
  - A vessel like the Lockheed Martin Vari-craft is an intriguing possibility

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An Alternative "Sea as Base" Maneuver Fleet

- ***Tentative recommendations for the "Sea as Base" Maneuver Fleet:***
  - Complete the LHD-8, for a force of 8 "big-deck" amphibious assault ships
  - Increase the build-rate of LPD-17s to two a year starting in FY 2007, and contract a multi-year production run for a total of 24 ships
    - Replace the 11-ship LPD-4 class with 12 LPD-17s, as originally planned
    - Replace the difficult to maintain 12-ship LSD force with an additional 12 LPDs, to help standardize the amphibious assault fleet and save on fleet-wide O&S costs
      - Retire the LSD-41/49s on a one-for-one basis as the second batch of 12 LPD-17s enter the force
      - Convert the four LSD-49s into MSC-manned landing force cargo ships that carry heavy engineer and motor transport equipment, and place them in a standby status
    - Total incremental costs for 15 addition LPD-17s above the nine now planned, assuming $1.1 billion a ship, will be $16.5 billion (FY 2005 constant dollars)
    - The transition to an all LHD/LPD-17 force would be complete by FY 2017/18
  - Organize the Amphibious Landing Force into eight, 4-ship, "Distributed Expeditionary Strike Bases," or DESBs, consisting of:
    - One LHD and one CG-52 AAW "shotgun" (modified to also allow for ballistic missile tracking and intercept)
    - Three "Maneuver Action Groups" consisting of one LPD-17 and one DDG-51
    - One, 2-ship LCS Division
    - One SSGN

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An Alternative "Sea as Base" Maneuver Fleet (2)

- Buy out the leases for all three MPF squadrons, as planned
  - Retain three MPF squadrons over the near- to mid-term
  - As Marine forces are withdrawn from Iraq, reconfigure two MEB equipment sets for Irregular warfare (to be further discussed)
  - Retain one MPF squadron as a "swing" maneuver sea base squadron, to either provide rapid heavy reinforcement for Irregular MPF forces, or to transport the assault follow-on echelon (AFOE) for amphibious landing forces

- As explained in the aviation power projection section, build a four-ship J-CVE class starting in FY 2007, at a rate of one every three years
  - The last ship in class would be authorized in FY 2016 and enter the fleet in FY 2019
    - Assuming each J-CVE can carry 23 JSFs, this four-ship force would carry 3.01 MEB ACE equivalents of Marine strike fighters
  - In FY 2019, shift the J-CVE production line over to LHDX
    - Experiments would determine whether or not this ship would retain a well deck, and if so, whether it should be a "wet" or "dry" well
  - (Note: recall that the incremental costs for these ships are in the aviation power projection ship line)

- Modify the current program for aerial ship-to-objective connectors for maneuver sea base forces
  - Terminate the total V-22 buy (360 USMC MV-22s and 50 SOF CV-22s) at approximately 200 aircraft, upgrade all to CV-22 standard, and form a Joint Tilt-rotor Force (JTRF) of ten operational 12-plane squadrons

An Alternative "Sea as Base" Maneuver Fleet (3)

  - The JTRF would support SOF, Ranger, Airborne, and Marine mission requirements, depending on the Joint Force mission assigned
  - JTRF squadrons could be temporarily supported off the J-AFSB, J-CVEs, or the LHDs
- Divert savings from the MV-22 reduction into: accelerated procurement of the CH-53X heavy lift helicopter buy; accelerated research and development on a Joint HLVTOL; and prompt recapitalization of the CH-46 fleet
  - As discussed, there are several plausible alternatives for the CH-46 replacement. The final decision would be driven by ***design-to-lift*** considerations
    - » In other words, the DoN would design the aerial ship-to-objective assault support aircraft based on the space available on the eight LHDs and 24 LPD-17s, and any additional maneuver sea base ships

– In this regard, replace the two T-AVBs with converted commercial ships with greatly enhanced aviation facilities
  - Two Maersk S-class conversions appear to be attractive candidates, given their large aviation support capabilities (72 CH-46 hanger spot equivalents and 15 VTOL operating spots), and relatively low costs (estimated to be between $300-500 million per conversion)
  - Both ships could also serve as alternative J-AFSBs
  - Importantly, these ships are large enough to support 48 MV-22s should the decision be made to retain that aircraft as the primary aerial ship-to-objective connector

An Alternative "Sea as Base" Maneuver Fleet (4)

- Complete development on high-speed surface ship-to-shore connectors
  - First priority should be on improved ship-to-shore surface assault connectors (e.g., LCAC(X) and LCH(X))
  - A 32-ship amphibious landing fleet and a notional eight-ship MPF(F) sea basing squadron could support an attack from the sea consisting of three brigade equivalents
    - This force would require 204 aerial ship-to-objective connectors (144 MV-22s plus 60 CH-53Xs)
    - Assuming a requirement of no more than ten connectors per maneuver sea base platforms (the ratio suggested by Garrison Era data), the ***maximum*** requirement for surface ship-to-shore connectors would be approximately 200.

- Complete development of a new class of high-speed intra-theater connectors such as the Joint High Speed Vessel
  - The introduction of high-speed intra-theater and surface assault connectors in the DoN's Sea as Base Maneuver Fleet has much broader implications for a modularly designed Total Force Battle Network
    - As previously discussed, the slow, beachable intra-theater connectors of the first Garrison Era were "one-way, one-shot" connectors; after they delivered their cargo across the beach, they provided no more useful contribution until the next major amphibious landing
    - In the Joint Expeditionary Era, there is no reason why these connectors could not have modular payload or weapons stations, which would allow them to make important contributions to TFBN operations throughout all phases

An Alternative "Sea as Base" Maneuver Fleet (5)

- » As will be discussed, a key part of the Littoral Combat Ship design is common mission module stations with common module interfaces; it would seem logical that similar mission module stations and interfaces be considered for every high speed connector in the TFBN
- » Such an approach would improve not just the performance of the DoN maneuver sea base, but potentially the entire TFBN, against all competitors and in all access conditions
- This discussion suggests a beachable intra-theater connector should be seriously examined, which would provide for new amphibious landing options

- Initiate a ***Joint*** experimental program for future sea-basing platforms and sustainment technologies
  - The focus of these efforts would be to eventually give the MPF "swing squadron" a true sea basing capability
    - Target cost for the effort would be $9-10 billion: (this would result in a landing force/MPF force procurement cost of approximately $25.5 - $26.5 billion, as compared to the planned MPF(F) cost of $24 billion)
    - To save money and to achieve a high degree of operational and tactical synergy with the amphibious landing fleet, replacing the MPF swing squadron with cheaper "LHD Lite" and "LPD-17 Lite" variants—ships without high end combat systems and built to relaxed commercial standards—should be one of the alternatives considered
    - However, care should be taken to identify a wide range of alternatives
    - The costs for these ships would be paid for in the naval auxiliary/support ship line
  - The *Enterprise* J-AFSB would be used to help identify high-speed aviation connector requirements for the maneuver sea base

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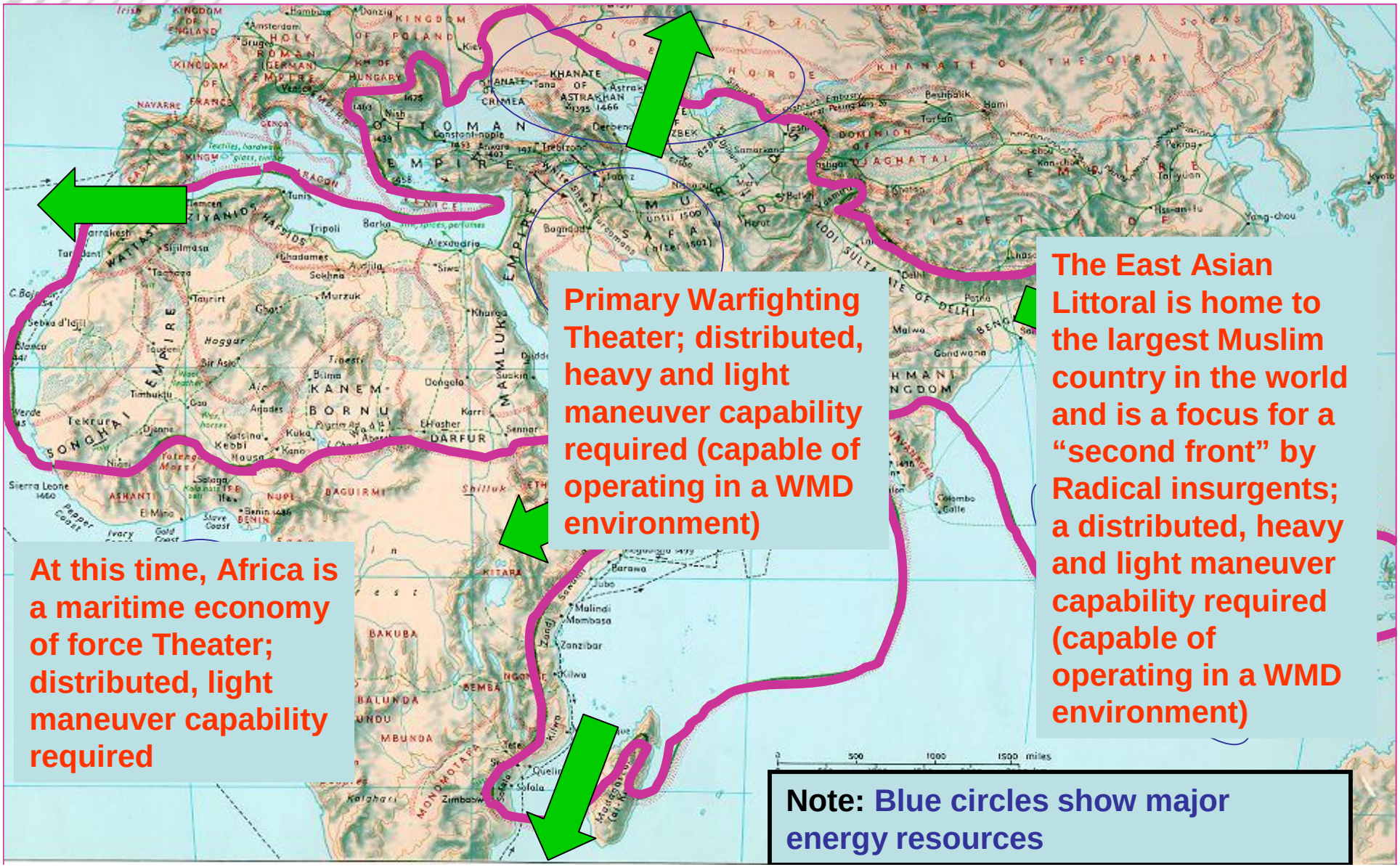
An Alternative "Sea as Base" Maneuver Fleet (6)

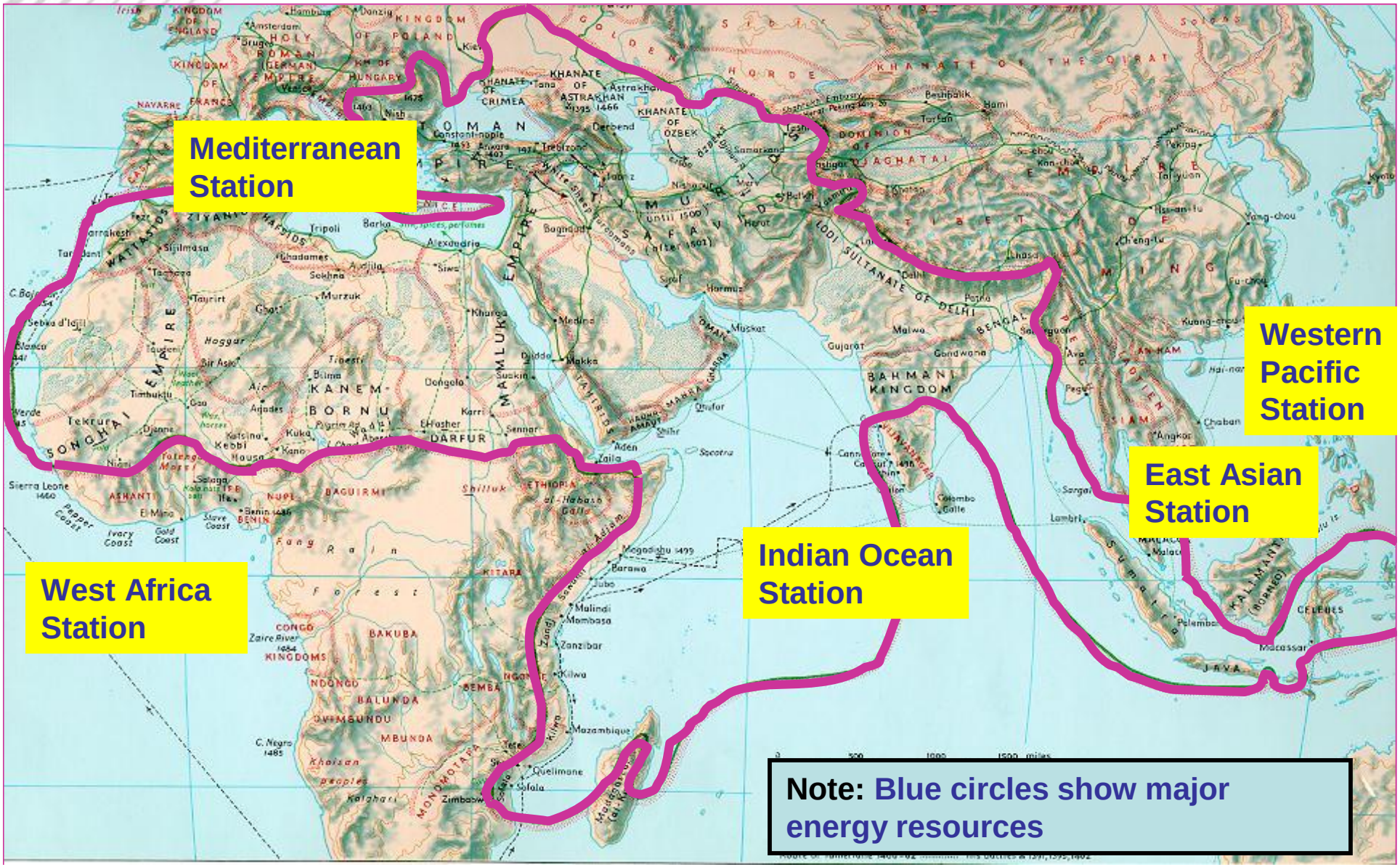
- Procure a new T-AKA—an attack cargo ship capable of selective discharge of containers and cargo—to support sustained Joint combat operations ashore (to be further discussed in the section on the Naval Fleet Auxiliary Force)
  - T-AKA support of Joint forces ashore would mimic how Combat Logistics Force ships support warships at sea: with "station ships" and "shuttle ships"
    - T-AKAs would load twenty-foot equivalent containers (TEUs) and other containerized cargo *pier side* at an intermediate staging base (ISB), transit to a Joint Operating Area (JOA), operating as Joint force logistical "station ships" until their cargo, food, ammunition, and supplies were exhausted
    - After being replaced by the next T-AKA in the shuttle, the ships would then return to the ISB to restock their supplies
  - T-AKAs would not initially be designed for the *at-sea transfer* of TEUs
    - This interim approach would allow experimentation on high capacity ship-to-ship transfer of containers and supplies in high sea states to take their course, but give the TFBN a valuable near-term selective off-load capability
    - These ships would likely be attractive for future DLA, Army, and Air Force afloat distribution ships
  - An LMSR or T-AKE variant would likely be suitable for this ship

- High-speed sealift vessels should be viewed as the follow-on to the current Surge Sealift Fleet, to replace the FSSs and augment the LMSRs
  - The Austere Access Shallow Draft Ship may be an attractive candidate, since it would start to decouple the Surge Sealift Fleet from deep water SPODs
  - The desirability of these ships delivering supplies directly to the sea base, and being able to support skin-to-skin transfer of equipment and supplies, should be informed by experiments

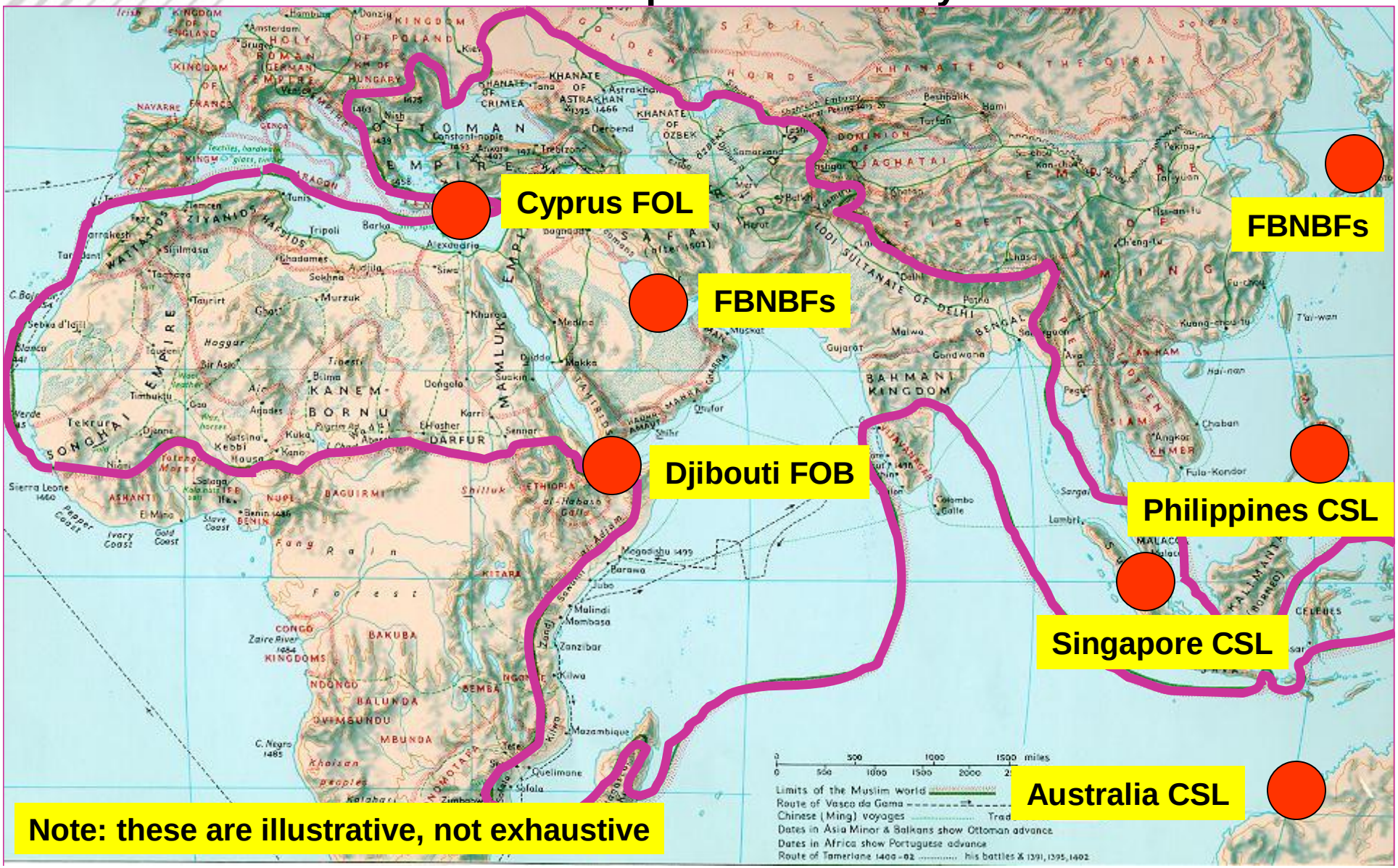
The Global Positioning of "Sea as Base" Maneuver Fleet Capabilities Should Be Driven By Future Forecasts for Both the GWOT and Traditional/Catastrophic Challenges



Five New "Fleet Stations" Would Provide an Operational Framework For the "Sea as Base" Maneuver (and DoN Power Projection) Fleet



These "Fleet Stations" Would Be Augmented by Forward-Based Network Battle Forces, and Forces at Numerous Forward Operating Bases, Forward Operating Locations, and Cooperative Security Locations



"Sea as Base" Maneuver Fleet Presence and Organization

- One DESB based in Japan would provide 1.0 presence in the Western Pacific; the remaining seven DESBs would form a rotational base capable of maintaining 1.0 presence in the GWOT theater
  - At any given time, this would provide four to six Distributed Maneuver Action Groups (a DDG-51/LPD-17 Division) on continuous patrol in the central GWOT theater, East Asian littoral, and Western Pacific
    - A DDG-51/LPD-17 Division represents a "GWOT *Dreadnought*"

- The Irregular Warfare MPF force would be distributed in four, 3-ship squadrons:
  - One at Ascension Island (West African Station)
  - One in the Med (Mediterranean Station)
  - One in Palau or NE Australia (East Asian Station)
  - One in Guam (Western Pacific Station)

- The "swing" sea-based MPF squadron, capable of serving as AFOE for amphibious assault shipping or reinforcing Irregular MPF squadrons, would be located in Diego Garcia in the central GWOT theater

- The African theater would be designated a maritime economy of force theater, supported by the Mediterranean and Ascension Island MPF (Irregular) squadrons; small SOF and light maneuver units supported by small combatants; and Battle Network Surge forces stationed in the US

CSBA "Sea as Base" Maneuver Fleet Presence and Organization (2)

- The forward DESBs have the size and flexibility to form the core of a hastily assembled, distributed, *hardened* expeditionary strike base in the central GWOT theater within ***18 days*** (assuming four day load out and 14 days sailing time for the DESB in Japan). The hasty DESB would include:
  - Two LHDs carrying rotary wing aircraft, aerial maneuver forces, and heavy surface forces
  - Six LPD-17s carrying a variety of modular Marine landing forces, with access to both air and surface connectors
  - Two cruisers and six DDGs, carrying among them 650 VLS cells
  - Two SSGNs carrying an addition 308 covert VLS cells and assigned SOF forces
  - Four LCSs, two with mine warfare packages and two with an ASW packages
  - These numbers do not count reinforcing J-CVNSGs, J-CVESGs, TAMD/Strike Surface Action Groups (SAGs), SSGNs/SSNs, LCS Divisions, or the J-AFSB
  - The combined Expeditionary Strike Base could carry approximately 8,500 troops in surge conditions

- The troop, cargo, and vehicle space on a DESB that is excess to current MEU(SOC) needs might be used in several ways. For example:
  - Have each DESB consist of three GWOT SPMAGTFs based around a reinforced rifle company "battle group" tailored to the LPD-17, supported by a Command/Support Group on the LHD (in other words, fill up the space with more powerful Marine units, and conduct distributed fire and maneuver operations at one tactical level lower than today's MEU(SOC))
  - Or leave the excess space in the DESBs to allow selective off-load of equipment and to allow the at-sea arrival and assembly of reinforcing Marine units, Ranger or Light Infantry battalions, SOF forces

CSBA "Sea as Base" Maneuver Fleet Presence and Organization (3)

- The basic force organization and laydown described herein—augmented by the supported by the T-AKA shuttle fleet in the Combat Logistics Force—would represent the "Spiral 0" distributed maneuver sea base fleet. This plan would allow *operational experimentation* of DoN sea basing capabilities, including:
  - At sea arrival and assembly of forces in 18 days versus 10-14 days
  - Selective offload of equipment and forces
  - Selective offload of supplies, ammunition, and spares
  - This Spiral 0 force would not allow full reconstitution of forces afloat (it is not yet clear that MPF(F) ships will allow this, either)

- One clear disadvantage of this plan, however, is that it would require increased manning over the current sea basing plan
  - The current force of 5 LHAs, 7 LHDs, 11 LPD-4s, 8 LSD-41s, and 4 LSD-49s require combined manning of 21,345 officers and Sailors, while the DoN sea basing plan of 9 LHD/LHARs and 9 LPD-17s, two MPF(F) squadrons, and one MPF(E) squadron requires 13,418 officers and Sailors, a savings of 7,945 billets
  - A sea-based maneuver force of 8 LHDs and 24 LPD-17s would require 17,800 officers and Sailors, or approximately 4,380 more than the current plan
  - The increased costs would have to be weighed against the increased capabilities of an LHD/LPD-17 sea basing fleet
    - The 3,545 billet savings provided by the alternate plan developed herein over the current amphibious baseline represents the biggest single proportional manpower savings of any of the TFBN components, by far
    - Moreover, this plan forges better operational linkages between the Navy and the Marines

CSBA "Sea as Base" Maneuver Fleet Presence and Organization (4)

- It could be built and developed ***for the same cost, in half the relative time, and with reduced operational and procurement risk compared to the current DoN sea-basing plan.*** In addition The basic force organization and laydown described herein—supported by the T-AKA shuttle force in the Combat Logistics Force—would represent the "Spiral 0" distributed maneuver sea base fleet. This plan would allow *operational experimentation* of DoN sea basing capabilities, including:
  - At sea arrival and assembly of forces in 18 days versus 10-14 days
  - Selective offload of equipment and forces
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Associated TFBN Shipbuilding Plan: Running Tally

- ***Aviation Power Projection Platforms*** **$**3.16 billion, steady state (2.26 ASEs)
- ***Sea as Base Maneuver Ships*** $2.2 billion through FY 2014 (1.57 ASEs)

CSBA

Surface Combatants

- Surface combatants are the primary defensive nodes in both Strike and Maneuver, as well as combined Power Projection Sea Bases. They also augment the aviation fires of carriers, and perform independent Sea Strike and Sea Shield missions

- 84 first- or second-rate battle force ships are either authorized or under construction: 22 CG-52s, 28 DDG-51s, and 34 DDG-79s
  - These 84 ships will form a vast distributed, modular, and networked missile battery; together, they will carry 8,468 VLS cells and 8,868 heavy missiles
  - They have common gas turbine propulsion plants; are all armed with versions of the AEGIS combat system; and have common ASW combat systems and ECM/ESM systems

- This surface combatant fleet is relatively young. The oldest ship in the programmed force, the CG-52, was commissioned 1986
  - The first ship of the DDG-79 class—the surface combatant now in production, was commissioned in 2000; a total of 34 of these fine ships will be completed by FY 2011
  - In other words, in FY 2011, the average age of the surface combatants in the TFBN's "battle line" will be approximately 13 years

- As noted above, the bulk of this "battle line" will consist of DDG-51/79s. The DDG-79 class now in production is far and away the finest multi-mission, VLS-equipped combatant in the world today; both the Japanese and South Koreans are copying them
  - The DDG-79s will be in the fleet until approximately 2045. They, and their immediate predecessors, the DDG-51s, will thus represent the modern-day equivalent of the British 74-gun third-rate *HMS Bellona*
    - The *Bellona's* basic design endured for nearly 100 years, from 1760 to 1840,[243] when the British Navy started to shift to iron hulled, steam-powered warships

CSBA

Surface Combatants (2)

- From a TFBN-wide perspective, the biggest problem with these 84 ships is that together they will be crewed by a total of 29,772 officers and Sailors—an i*ncrease* of 4,602 personnel (18.3%) over the current 70-ship "battle line"

- Partly as a result, a new and even more capable surface combatant—the 14,000-ton DDX—is nearing production
  - The first ship in class is scheduled to enter production in FY 2007
  - The DDX can trace its roots to the mid-1990 SC-21 program, and to the first planned ship of that program, the DD-21

- Unquestionably, the DDX will the contemporary technological equal of the *Warrior* and the *Dreadnought*—two earlier British warships that upended their contemporary combatant design regimes. It is designed to introduce a host of new fleet technologies. Two among them stand out:
  - Advanced automation and human factors engineering which will allow a crew size between 125-175—or half to two-thirds smaller than that of a DDG-51/79; and
  - A new integrated electrical power/propulsion system
  - Both of these technologies will eventually lead to important TFBN O&S savings

- The ship also represents a blend of offensive firepower, survivability, and staying power unseen since the first Expeditionary/Battleship Era
  - The DDX's main battery consists of 80 large diameter VLS cells, each capable of dual-packing *two* battle force missiles (for a total magazine capacity of 160 battle force missiles), *and* two new 155mm (6-inch) Advance Gun Systems (AGSs)
    - In essence, the AGS is a new type of gun-launched guided missile system, with a range of 85 miles

Surface Combatants (3)

  - The modular AGS magazine found on the DDX will carry 920 rounds, each of which represents the same approximate lethality as a small diameter bomb, or SDB
  - Although the cost-per-kill of these gun-launched missiles is as yet unclear, it promises to be relatively inexpensive
- In addition, the DDX would boast the smallest signature and most survivable design of any surface combatant in the world, by a wide margin

- Indeed, the introduction of the DDX would make the DDX the most powerful surface combatant in the world
  - The DDX would carry a battle force missile load over one-fourth larger than a Russian *Kirov*-class first rate combatant, which has a FLD nearly twice as big as the DDX
  - Indeed, with its large VLS load and new gun-missile system, this ship would be better designated either a CA, for heavy cruiser, or CBL, for large littoral cruiser

- All of this capability comes at a relatively high price—at least in terms of the expected shipbuilding budget environment
  - Depending on the size of the class production run, cost projections for a single DDX range as high as $2.1 billion

- Meanwhile, the surface combatant fleet is contemplating an important new mission: providing extended air, cruise, and ballistic missile defense for Joint Forces operating ashore
  - In Joint power projection operations, the future surface combatant fleet will be expected to protect Power Projection Sea Bases, APOD/SPODs, and Joint forces ashore from long-range cruise and ballistic missile attacks launched from deep inland operating sanctuaries

CSBA

Surface Combatants (4)

  - This requirement is spurring calls for a new theater air and missile defense (TAMD) ship, now called CG(X)

- It seems clear that the Navy leadership places higher priority on the CGX than the DDX
  - The original plans for DDX's predecessor, the DD-21, called for a production run of 32 ships
  - With the cancellation of the DD-21 program and the initiation of the DDX program, the planned production run fell to between 16 and 24 ships
  - Now, the planned number of DDXs has been reduced again, probably to nine ships (one per ESG forecast for the DoN Sea Basing plan)
  - Meanwhile, the introduction of the CGX has been dramatically accelerated, with the first CG(X) now planned for authorization in FY 2011
  - One reason that the DDX appears to be valued less than the CGX is that the ship is widely perceived as filling a niche TFBN mission (land attack in a heavily defended/ contested littoral), while the CGX is perceived as introducing an entirely new TFBN mission (TAMD over Joint forces operating deep inland)

- While plans are for the CGX to share the same hull as the DDX, their two missions point out the difficult operational and design choices now facing TFBN planners
  - At the broadest level, what role will surface combatants play in heavily defended and contested/denied littorals?
    - What is the value of stealth/protection? Is it better to pursue shaping and active coatings? Can much higher levels of protection be reasonably afforded? Are semi-submersible designs a better approach?
    - What about other approaches, such as large numbers of netted, but relatively non-stealthy, unarmored surface platforms?

CSBA

Surface Combatants (5)

    - Or should this problem be tackled using submarines and unmanned systems, with surface combatants standing off and employing long-range weapons?
  - Similarly, will a TAMD ship that may need to be constantly radiating while on patrol require high degrees of stealth?
    - Will longer range missile interceptors for ballistic and cruise missile and aircraft allow these ships to operate outside of a contested littoral until an adversary's A2/AD network is destroyed?

- Given this level of uncertainty, TFBN planners are now faced with a tough choice
  - On the one hand, the current surface combatant “battle line” enjoys an overwhelming global advantage in AAW, ASW, and ASuW combat systems, and an overwhelming global advantage in terms of combat power
    - From a warfighting perspective, the surface combatant “battle line” appears to be the Sea as Base Power Projection/Regional Deterrent Fleet component *in least need of near-term transformation*
      - As has been discussed, the *Nimitz*-class carriers are the oldest ship design in production and must be replaced
      - The maneuver sea base fleet is in greater need of updating than the surface combatant fleet: the LPD-4 class is nearing the end of its useful service life, the LSDs are becoming increasingly expensive to maintain, and the LHAs must be replaced
  - On the other, even setting aside the improved combat power and survivability enhancements promised by the DDX and CGX, TFBN planners are eager to pursue the O&S savings associated with their reduced crew sizes and new integrated electrical power systems

CSBA

Surface Combatants (6)

- Given the expected budget climate and the expected high costs of the DDX and CGX, however, any transition from the current fleet to the new combatants will not have an appreciable impact on force O&S costs for at least two decades
  - For example, for every 12 billets reduced from a AEGIS/VLS combatant, the 84-ship "battle line" would immediately reduce its overall manning requirement by 1,008 billets
  - In contrast, assuming a DDX crew size of 150, a crew savings of approximately 200 billets over a DDG-51/79, and the one-for-one replacement of early DDG-51s with a DDX, it would take five DDXs—and over ten years—to achieve a similar 1,000 billet manpower savings (assuming the first DDX would be authorized in FY 2007, be commissioned in FY 2011, and be followed by further DDXs at the rate of one a year)
    - Note: this scenario is best case; current plans portray the DDXs as *additive to* TFBN numbers, not as replacing DDG-51s
  - Moreover, there are many O&S advantages associated with a surface combatant force with a common propulsion plant and combat systems
    - These advantages are reflected in lower force-wide training costs and logistical overhead

- This discussion suggests one way to approach this problem would be to design a new surface combatant, dubbed the "SCX," with the same warfighting capabilities and O&S savings promised by the DDX and CGX—but for a much cheaper price
  - For example, building a new modular SCX for half the price of a DDX would allow TFBN designers to replace legacy VLS combatants in half the time

CSBA

Surface Combatants (7)

- From a competitive strategy perspective, it may thus be in the DoN's best interest to squeeze the most capabilities and savings out of its current surface combatant force for as long as possible, to bide its time while other navies struggle to close the huge advantage enjoyed by the US in the closely coupled VLS-armed combatant design regime, and to plan an abrupt shift in its surface combatant designs at some time in the future

- This was precisely the strategy followed by the British Royal Navy after 1815. After its final defeat of Revolutionary France, with the world's finest and largest surface fleet and no near-term naval competitor in sight:

  "It (was) not in the interest of Britain—possessing as she does so large a navy—to adopt any important change in ships of war…until such a course is forced upon her."

- The Royal Navy thus adopted a "Strategy of the Second Move." The Navy closely followed the development of foreign naval technologies, and pursued them only if they threatened the Royal Navy's dominant position
  - Once the French started experimenting with explosive shells in 1824, the British introduced the long 32-pounder and explosive shells the following year
  - Although the 1840 Lloyd's Register listed some 720 large steamships, the British Royal Navy had none…because no other Navy had aggressively pursued them. Yet fears that the US or French Navy would decide to deploy a steam fleet compelled them to launch the steam-powered *Ajax* in 1845, and screw steam propeller *Agamemnon* four years after that
  - The French *Gloire*, a wooden-hulled ship clad in iron, prompted the 1860 commissioning of the iron-hulled *Warrior*, the *Dreadnought* of its day

CSBA

Surface Combatants (8)

- Given the current supremacy of their AEGIS/VLS "battle line," like British Navy planners before them, TFBN designers can afford to slow down and make more measured moves in the redesign of their surface combatant fleet
  - The goal of these measured moves would be to design a new modular surface combatant or family of combatants that can perform any surface combatant mission more effectively, and at a far cheaper price, than contemporary closely coupled, VLS-armed, multi-mission combatants

- Adopting a contemporary "Strategy of a Second Move" would require a concerted effort to maintain the effectiveness of the current "battle line," a concerted commitment to R&D funding, a willingness to build prototypes, and a determination to maintain a vibrant surface combatant production base

- TFBN planners have already planned a thorough updating and modernization of the programmed 84-ship surface "battle line"
  - The Cruiser Modernization Program and the follow-on DDG Modernization Program are designed to ensure the CG-52 and DDG-51/79 classes remain capable throughout their full 35-year service lives
  - The AEGIS Open Architecture (AOA), VLS Open Architecture, and Cooperative Engagement Capability (CEC) programs appear especially important, as they will:
    - Move the entire 84-ship AEGIS/VLS fleet to open architecture standards, making them more effective TFBN platforms;
    - Reduce the number of different combat systems baselines, facilitating fleet-wide upgrades and reducing fleet-wide training costs; and
    - Facilitate the immediate force-wide adoption of new VLS-launched guided weapons

CSBA

Surface Combatants (9)

- Near-term R&D initiatives would focus on developing a variety of new surface combatant technologies
  - In this regard, the DDX represents a goldmine of 10 new technologies
    - Significantly, it appears that few of these new technologies can be easily incorporated easily into variants of the DDG-79 hull, which is at or near its design margins in weight and volume
    - Thus, under any circumstances, a DDX technology demonstrator should be built

- Near-term R&D would also focus on exploring different combatant design approaches and on reducing the cost of future surface combatants
  - The DDX represents just one approach for future surface combatants; its design should compete against other technology demonstrators
  - At least three alternative approaches come to mind:
    - An LPD-17-based surface combatant, to capitalize on the sunk costs associated with that platform;
    - Semi-submersible designs built to commercial standards, like the Striker missile barge concept; or
    - Large/medium, modular “carriers of objects,” perhaps built to relaxed commercial standards
  - As previously stated, the design goal should be to design a new modular SCX capable of performing any required future surface combatant role for half or two-thirds the price of a DDX

CSBA

Surface Combatants (10)

- This strategy would require special attention be made on improving near- to mid-term Battle Network TAMD capabilities, since the improved TAMD capabilities forecast for the CGX would be delayed
  - This means the battle line's AEGIS system would need to be modified to ensure that the TFBN would be able to track and engage near-term ballistic missile threats
    - AEGIS S-band upgrades should allow improved tracking and discrimination of ballistic, cruise and anti-ship cruise missiles
  - This would also mean the TFBN would have to develop and field new, extended range weapons such as the SM-3 and SM-6 interceptors
    - SM-3 exo-atmospheric interceptors should allow long-range TBM engagements
    - The planned SM-6 long-range active SAM should allow deep overland missile engagements
  - For overland TAMD defense, the E-2C Radar Modification Program is especially critical for extending the TFBN's sensor reach, and exploiting the full kinematic potential of the SM-6 interceptor

- With regard to specific TFBN TAMD requirements:
  - As the leading edge of any Joint forcible entry or power projection operation, at least one surface combatant in every Distributed Expeditionary Strike Base should have a ballistic missile intercept capability
  - The TFBN will also require several independent TAMD SAGs to provide extended air and missile defenses over allied territory or over Joint Operating Areas

- The one surface combatant warfighting capability that would be lost by adopting a Strategy of the Second Move would be the DDX's Advanced Gun System, which would have introduced a completely new TFBN volume guided weapons fire capability

CSBA

Surface Combatants (11)

  - Should this capability be deemed critical, it could likely be put to sea on a relatively low-cost, LPD-17 Naval Surface Fires Platform, with one to three AGS systems and a substantial VLS capability

- A Strategy of the Second Move would require modifications to the current shipbuilding infrastructure, since a delay in the DDX/CGX programs would mean there would not be enough work in the near-term to sustain the two yards now capable of building complex surface combatants—Bath Iron Works and Ingalls—unless additional money for industrial base maintenance was authorized by Congress
  - This point will be discussed more fully in the section on the Industrial Base

CSBA

Surface Combatants (12)

- ***Tentative recommendations for the Surface Combatant Fleet:***
  - Place near-term priority on recapitalizing TFBN aviation power projection and maneuver sea base platforms; adopt a Strategy of the Second Move for surface combatants
  - Fully fund the Cruiser Modernization Program and DDG Modernization Programs, particularly AEGIS Open Architecture, VLS Open Architecture, CEC, and fleet-wide TAMD improvements to make the modular AEGIS/VLS "battle line" more flexible, adaptable and effective
  - Expand near-term TFBN surface combatant TAMD capabilities and platforms:
    - Fund the AEGIS S-band radar upgrade, as well as the SM-3 and SM-6 interceptor programs
      - The E-2C RMP also is an important TAMD program, as it would provide a key overland sensor for the TAMD network
    - Provide each DESB with at least one surface combatant modified to conduct ballistic missile intercepts
    - Providing Japanese approval, base a three-ship TAMD SAG in Japan, in addition to the surface combatants associated with the DESB and J-CVNSG based there
    - Assemble a TFBN rotational pool of four TAMD SAGs
  - Build one DDX as the first of several surface technology demonstrators for defended/contested access operations, to demonstrate the integration of its ten associated engineering development modules, and to determine which of these capabilities should be incorporated into future surface combatants
    - Request that the DDX be built in FY 2007 as planned, ***but with R&D dollars***

CSBA

Surface Combatants (13)

- At the same time, start a design competition for a next-generation, modular surface combatant or family of combatants, with capabilities that are the same or greater than the DDX/CGX, but that can be built for substantially less cost
  - Build two additional surface combatant technology demonstrators to compete against the DDX design
  - Plan to introduce the first of a new class of SCX (surface combatant X) ships in FY 2015, the year after the completion of the LPD-17 production run
    - The design of the SCX would be informed by the technology demonstration competition held between FY2007 and FY 2014
  - Given that the LPD-17 program would expend $2.2 billion per year, that cost becomes the planning figure for the SCX program
    - An SCX designed to cost $1.1 billion would allow two SCXs to be built per year
    - An SCX designed to cost $.75 billion would allow three SCXs to be built per year

- In essence, then, this plan defers new large surface combatants for eight years, replacing the DDX production run scheduled to start in FY 2007 and the CGX production run scheduled to start in FY 2011 with a three-ship R&D technology demonstrator program, followed by a large production run of new, modular SCX combatants

Notional TFBN Task Group Organization and Associated Surface Combatant Requirements

	CG-52	DDG-51	DDG-79	
1 FD J-CVNSGs	1	1	1	
1 FD DESB	1	1	2	
1 FD TAMD SAG	1	1	1	
8 J-CVNSGs	8	8	8	
7 DESBs	8	8	16	
4 J-CVESGs	4	4	4	
4 TAMD SAGs	4*	4	4	
Total	**26 (have 22)**	**26 (have 28)**	**34**	**86**

A DDG-51 carries a towed array; a DDG-79 has a full helicopter support capability

The CGs assigned to a DESB should have a full TAMD capability

Associated TFBN Shipbuilding Plan: Running Tally

• ***Aviation Power Projection Platforms***	**$**3.16 billion, steady state (2.26 ASEs)
• ***"Sea as Base" Maneuver Ships***	$2.2 billion ***through FY14*** (1.57 ASEs)
• ***Surface Combatants***	$2.2 billion ***starting in FY15*** (1.57 ASEs)

CSBA

Paying for the DoN "Sea as Base" Power Projection Fleet

- The total shipbuilding costs associated with this "Sea as Base" Power Projection/ Regional Deterrence Fleet are $5.36 billion per year, steady state (3.83 ASEs)
  - In comparison with the DoN's plans for aviation power projection platforms, this plan would will save approximately $13 billion in carrier life cycle procurement costs
    - The precise O&S savings associated with this plan are unclear, although the interim FY 2019 force of 8 *Nimitz* class carriers, 2 J-CVN-21s, and 4 J-CVEs would carry approximately 4,300 fewer crew members than the current 12-carrier force (a 11.5% reduction)
      - An additional 800-1,000 billet savings would accrue every time a J-CVN-21 replaced an additional *Nimitz*-class carrier (depending on the final crew savings seen in the CVN-21 class)
  - In comparison with the DoN's plans for maneuver sea base platforms, this plan would cost approximately $2-3 billion more (not counting the T-AKA fleet)
    - This plan would result in higher O&S costs, as the associated force would require approximately 4,380 more active duty billets than currently planned
  - In comparison to the DoN's plans for surface combatants, it would save over $20 billion in near-term shipbuilding costs (assuming one $2 billion DDX per year from FY 2007 through FY 2014 ($16 billion); and one $2 billion CGX per year from FY 2011 through FY 2014 ($4 billion))

- Significantly, the transition to this baseline plan would be complete by FY 2019 with far less risk than the DoN plan
  - J-CVN-22 and the fourth J-CVE would be commissioned in FY 2019
  - The last LPD-17 would be commissioned in FY 2017
  - The replacement of the 84-ship battle line would be well underway

Initial Thoughts About the Potential Impact of the GWOT On the TFBN's Platform Architecture and Operations

- The US Naval Battle Force now finds itself in much the same position as did the Royal Navy after its defeat of France in 1815. With no ocean-going naval challenger on the horizon, the Royal Navy confronted the transnational threat of human slave trading for the next 40 years

- This new type of naval war saw the need for:

  - ***Continuous maritime patrol***: *"…at any given point for the next forty years, some twenty or so Royal Navy vessels would be on patrol along the Atlantic coast of Africa, trying to stop the trade in human cargo…on which the Atlantic economies had been built. Ending the trade would be the first real test of the Royal Navy in the new world order, the first test of its transition from the world's dominant military force to world policeman."*

  - ***Different types of warships:*** *"The war on slavers demanded many of the same skills as the* **close blockade***, but with a very different range of ships. The navy had learned the lessons of its failure to stop American smugglers. Frigates, sloops, two-masted brigs, brigantines, and schooners were small enough to work the palm tree-lined inlets and sluggish river estuaries where slave ships hid and picked up their elicit cargo and fast enough to run them down in open sea. Ships of the line were useless for this kind of work; only once did a mighty 74 put in a cameo appearance. Instead, the burden of being world policeman would increasingly fall on the Royal Navy's smaller vessels, and the dedicated, independent-minded captains, commanders, and even lieutenants who officered them"* (emphasis added)

Initial Thoughts About the Potential Impact of the GWOT On the TFBN's Platform Architecture and Operations (2)

- ***Combined arms strike and maneuver operations along the African littoral:*** raiding parties consisting of Sailors and Royal Marines from ships' companies were an important part of the overall counter-slavery operations (prompt combined arms littoral strike and maneuver)

- ***Periodic "counter-sanctuary" operations:*** *"In 1849 Palmerson sent in a flotilla of navy ships to bully Brazil into enforcing the ban (on slaving) it had already signed on paper."*

- ***Complementary counter-piracy operations***: *"Ending piracy went hand in hand with ending the slave trade; captains and crews engaged in one were almost inevitably drawn to the other….Nowhere was piracy more persistent and dangerous than in the Indian Ocean, especially in the Malay Straits…"*

Arthur Herman
To Rule the Waves

CSBA

Initial Thoughts About the Potential Impact of Homeland Defense Requirements On the TFBN's Platform Architecture and Operations

- Since the birth of the Republic, both the Navy and the US Coast Guard have shared responsibilities with regard to securing the maritime approaches to the US
- In 1998, A National Fleet Policy Statement committed the US Coast Guard and US Navy to work together "…to build a national fleet of multi-mission surface combatants, major cutters, patrol boats and aircraft to maximize [their] effectives across all naval and maritime missions
  - The idea of a "National Fleet" is especially applicable to the post-9/11 world, since: "It is not just an away game for the US Navy any longer, and it is not a home game, either. Rather, the roles are merging into one game."
  - Indeed, the National Fleet Policy Statement was renewed in 2002 after the 9/11 attacks
- A "National Fleet" construct for the Joint Expeditionary Era might call for:
  - The US Navy to conduct forward offensive and defensive operations in the GWOT central theater
  - The USCG to secure the approaches to the US out to the limit of the 200-mile exclusive economic zone (EEZ)
  - Both services to conduct maritime hot pursuit/interception of potential terrorist targets on the open ocean, from their normal operating locations
  - The US Coast Guard to be prepared for surging forward and augmenting Navy operations overseas (as it did in World War I, World War II, Vietnam, Desert Storm, and OIF), and the US Navy to be prepared to augmenting US Coast Guard assets should the need arise to expand the maritime defensive perimeter around the US (as it did during World War II when German submarines operated off the US east coast, and immediately after the 9-11 attacks)

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Maritime Homeland Defense Requirements (2)

- The idea of a National Fleet also implies that the GWOT/Global Patrol/Homeland Defense Fleet should include both USN and USCG platforms, and that these platforms should have as high a degree of commonality as possible

- In this regard, the planned Coast Guard Deepwater Cutter Fleet will likely consist of a minimum of:
  - Eight National Security Cutters, Large, with a full load displacement just over 4,000 tons
  - Approximately 25 National Security Cutters, Medium, with an FLD in the range of 2,800-3,000 tons
  - Approximately 58 Fast Response Cutters, with FLDs > 300 tons
  - These 91 cutters will be augmented by hundreds of smaller USCG craft
  - Although these 91 cutters will not be paid with DoN shipbuilding money, because of their important role in securing the maritime approaches to the US, they should count toward a combined, *National* TFBN

- There has been much discussion on improving the level of "maritime domain awareness," especially with regards to maritime traffic approaching US ports
  - These discussions have centered on the idea of creating a maritime ISR fusion center along the lines of the North American Air Defense Command, or NORAD
  - Should a "Maritime NORAD" be formed, it seems logical that it should be jointly manned by USCG, Navy, and other US Government (USG) personnel
  - Two joint USCG/Navy BAMS squadrons, one on each coast, would provide valuable cueing information for USCG cutters and other National Fleet forces protecting the maritime approaches to the US

Maritime Homeland Defense Requirements (3)

- Navy TFBN forces provide important missile defense capabilities for the homeland
  - A Theater Air and Ballistic Missile Defense Surface Action Group now maintains a modified combatant in the Sea of Japan to provide early target discrimination for the National Missile Defense (NMD) system in case of a North Korean ballistic missile launch toward US territory
  - In the future, TFBN forces may play an expanded role in providing missile defense for the 50 US states and US allies

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Operational Tasks For the GWOT/Global Patrol/Homeland Defense Fleet

- Based on historical lessons and Joint operational experience to date, there thus appear to be five key operational tasks for the GWOT/Global Patrol/Homeland Defense fleet

- *First, in conjunction with other services and our allies, conduct a distributed close blockade of the littorals in the central GWOT theater, and pursue a strategy of global maritime "hot pursuit" within the central theater and along the sea and land lines of communications that originate from it.* Specified tasks:
  - Conduct persistent, overt and covert ISR and patrolling of littoral seas and potential enemy littoral operating locations to identify enemy targets and intentions, and to learn local operating conditions
    - BAMS/MMA are key capabilities in mounting a distributed close blockade
  - Conduct persistent maritime interdiction operations and maritime hot pursuit of terrorist surface traffic—carrying cargo, equipment, contraband, personnel, leaders, and possibly WMD seas—to deny the enemy use of coastal seas or the oceans
  - Conduct prompt kinetic strikes against fleeting terrorist targets on land and sea
  - Conduct/support covert landing party operations against terrorist targets (especially when host nation is unaware of US intentions, or desires plausible deniability)
    - Provide unobtrusive offshore and covert SOF FOBs/FOLs
  - Conduct/support Independent raids, combat support operations in support of SOF/joint raids (e.g., maritime Ranger operations), and prompt counter- sanctuary operations (e.g., TF 58)
    - These operations are likely seldom to involve a landing party larger than two reinforced battalions in size

Operational Tasks For the GWOT/Global Patrol/Homeland Defense Fleet (2)

- *Second, in conjunction with other services and our allies, prevent an enemy maritime strategy of guerre de course: ensure the uninterrupted global flow of maritime trade and energy resources within and from the central GWOT theater* Specified tasks:
  - Protect mega-ports from maritime irregular and catastrophic attacks
  - Provide SLOC escort of high value commercial traffic
  - Protect offshore energy sources
  - Conduct anti-piracy/anti-drug patrols
- *Third, in conjunction with the US Coast Guard, other services, and USG agencies, secure the maritime approaches to the United States*
  - Augment US Coast Guard assets in times of heightened alert or in response to attacks/threats against the US homeland
- *Fourth, provide air and missile defense of US and allied territory from air, cruise missile, and ballistic missile attack*
- *Fifth, be prepared to support major Joint Stability Operations (STABO) in failed states in the GWOT central theater or in adjacent theaters, or to support weak governments fighting a Radical Islamic insurgency*
  - Division (+) strength

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Implied TFBN Platform Requirements for the GWOT/Global Patrol/Homeland Defense Fleet

- A combination of distributed aviation and strike platforms either in or adjacent to the central GWOT theater, capable of providing/conducting persistent ISR and prompt strike against fleeting terrorist targets
- Persistent maritime surveillance platforms and a heavy presence of small combatants to conduct a distributed close blockade of the GWOT littoral, and to perform MIO and maritime hot pursuit of terrorist targets
- Distributed covert operations and strike bases to support persistent covert reconnaissance; unwarned, time-critical strike; and clandestine landing party (SOF) operations
- A minimum of two battalions of maritime combined arms infantry—operating continuously on mobile sea bases either in or adjacent to the central GWOT theater—to provide the capability to conduct two independent battalion-size raids; to provide combat support for two large SOF operations/raids; or to conduct a combined prompt counter-sanctuary operation
- A means to promptly deploy a reinforced division-sized unit (MEF) for a major Joint STABO or counter-insurgency operation
- System commonality and operational links between the GWOT/Global Patrol/Homeland Defense Fleet and the Coast Guard's Deepwater Cutter fleet

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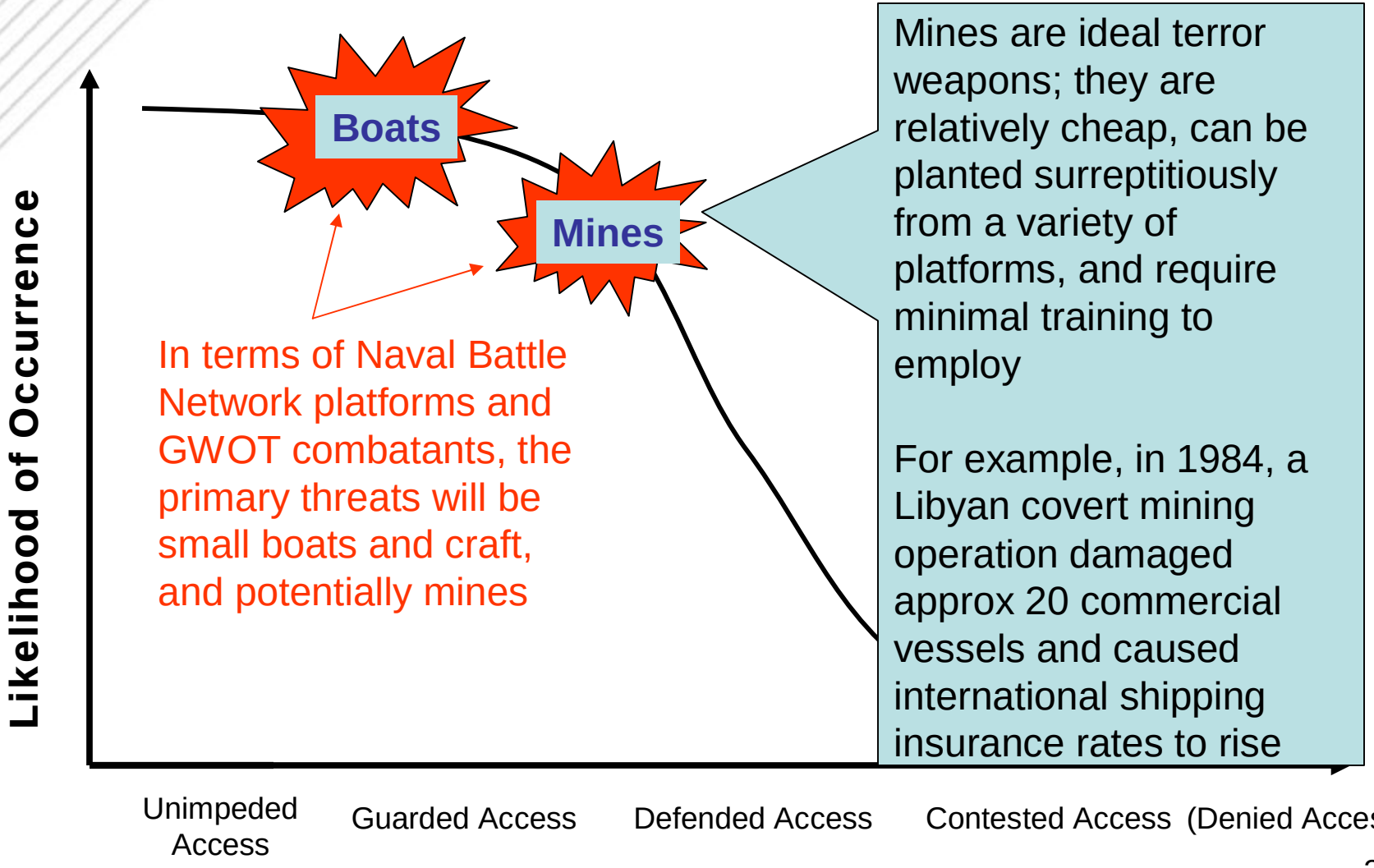
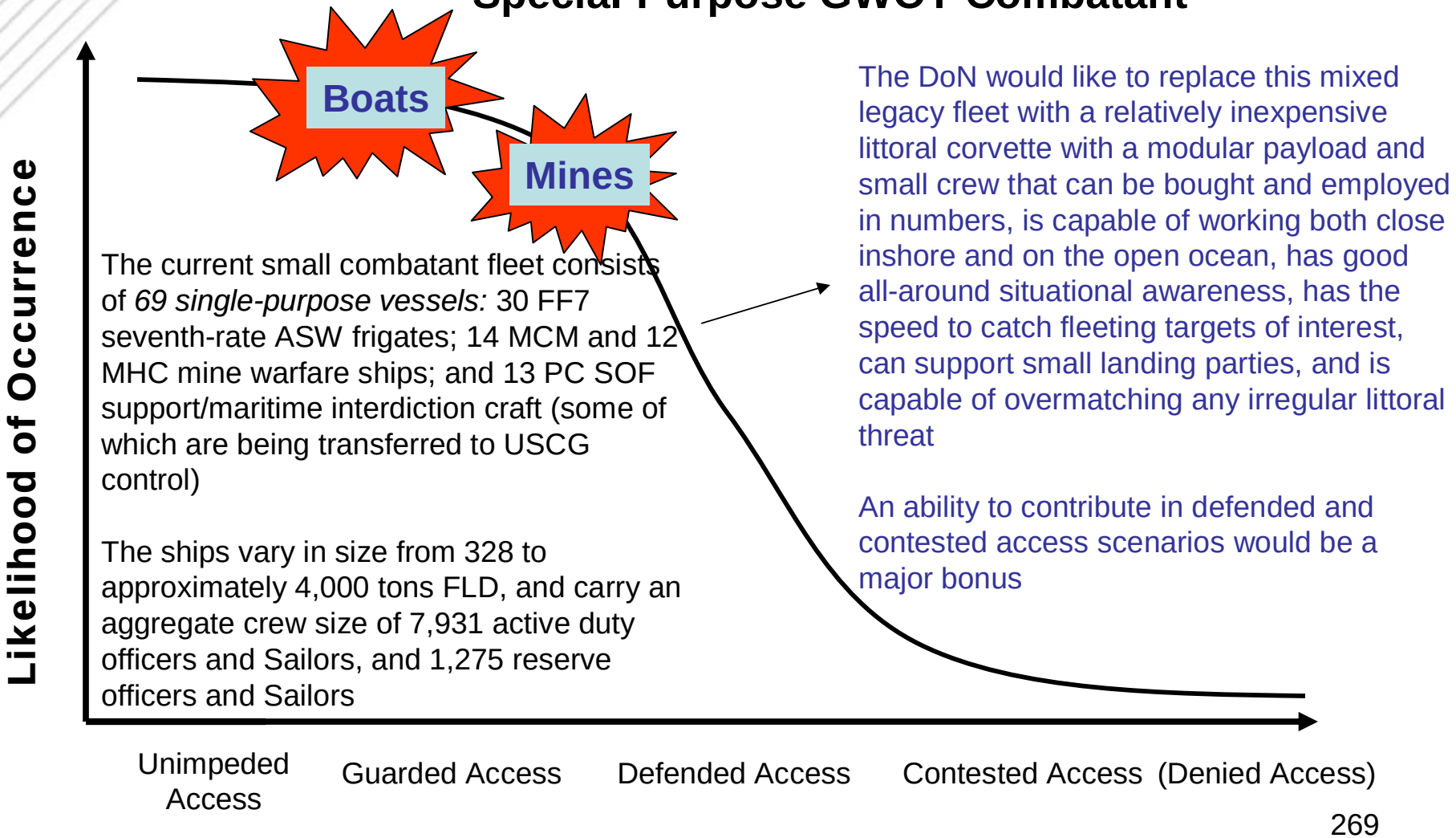
Building a *National* GWOT/Global Patrol/Homeland Defense Fleet

- The following discussion will focus primarily on Navy TFBN platform requirements required for GWOT/Global Patrol/Homeland Defense operations in forward theaters
  - It assumes that the planned USCG Deepwater cutter fleet of 91 vessels is the *minimum* size of the flee
    - A recent RAND analysis suggests that this number, developed before the 9-11 attacks, might need to be substantially higher in light of post-9-11 requirements
  - It assumes that some sort of Maritime NORAD organization will be established, and manned by USN, USCG, and USG personnel
    - While it assumes that a Joint BAMS squadron will ultimately operate off each coast, these costs are not included in the TFBN platform architecture plan
  - It assumes that a Theater Air and Missile Defense Surface Action Group (TAMD SAG) will continue to be required in the Sea of Japan, and that it will be forward deployed in Japan
    - Future additions of TFBN TAMD assets assigned to Homeland Defense are uncertain, and are not considered in the basic TFBN platform architecture plan

Most GWOT/Global Patrol/Homeland Defense Fleet Operations Will Occur In Either Unimpeded or Guarded Access Scenarios



The Requirement for Distributed GWOT Patrols, Distributed Counter-boat and Counter-mine Capabilities in the GWOT Theater, as Well as an Enduring Requirement to Support SOF and Small Landing/Raiding Units, Demands a Special-Purpose GWOT Combatant



The current small combatant fleet consists of *69 single-purpose vessels:* 30 FF7 seventh-rate ASW frigates; 14 MCM and 12 MHC mine warfare ships; and 13 PC SOF support/maritime interdiction craft (some of which are being transferred to USCG control)

The ships vary in size from 328 to approximately 4,000 tons FLD, and carry an aggregate crew size of 7,931 active duty officers and Sailors, and 1,275 reserve officers and Sailors

The DoN would like to replace this mixed legacy fleet with a relatively inexpensive littoral corvette with a modular payload and small crew that can be bought and employed in numbers, is capable of working both close inshore and on the open ocean, has good all-around situational awareness, has the speed to catch fleeting targets of interest, can support small landing parties, and is capable of overmatching any irregular littoral threat

An ability to contribute in defended and contested access scenarios would be a major bonus

The Littoral Combat Ship, Although Touted as a Contested Access Platform, Appears to Be Better Suited as a GWOT Patrol Ship/Littoral Corvette

- Both LCS candidates now in detailed design—one designed by Lockheed Martin (LM) and one designed by General Dynamics (GD)—have FLDs between 2,600-2,800 tons, navigational drafts of 15 feet or less, maximum crew sizes of less than 75 (including the core crew and a mission package crew), and top speeds in excess of 40 knots
  - Both carry rapidly reconfigurable modular mission packages

- Currently planned modular missions packages will allow each hull to perform the FF7's littoral ASW mission, ***or*** the MCM's and MHC's littoral mine countermeasures mission, ***or*** the PC's SOF support mission. In other words, both LCS designs are *multi-purpose, single-mission ships*
  - Moreover, because of their large amounts of reconfigurable internal volume and modular payload capability, both designs can be modified to perform a variety of additional missions
    - For example, both designs could carry and provide direct support to small, Special Purpose Marine Air-Ground Task Forces (SPMAGTFs) or special operations (SOF) detachments, reintroducing the old Fast Destroyer Transport mission (APD) into TFBN service
    - Both designs have the reconfigurable volume to give them a potential secondary mission as a "fast connector" for expeditionary sea base operations
    - The ships could also support special-purpose ISR detachments, which might allow some of the ISR requirements currently levied on the SSN force to be conducted by the GWOT patrol fleet, freeing up high-value SSNs to concentrate on ASW and covert strike and SOF support missions

Indeed, a Two-Ship LCS Division Consisting of One LM Version and One GD Version Would Appear To Form A New Type of "Distributed Littoral Frigate"

- The LM version is smaller and more nimble, and has the shallower draft. It can enter more than 92% of the world's ports
- The GD version is larger and less maneuverable, but boasts larger aviation support facilities and a large, open payload bay capable of carrying up to 34, seven-ton Medium Tactical Vehicle Replacement trucks, or other heavy vehicles such as the Marine Corps Expeditionary Fighting Vehicle (EFV) or Light Armored Vehicle (LAV)
- Among them, the two ships could carry/provide:
  - Four+ H-60 helicopters, 12+ Vertically-launched Tactical Unmanned Aerial Vehicles (V-TUAVs), or a combination thereof; and "lily pad" landing support for CH-53 or V-22 aircraft;
  - Eight Rigid Hull Inflatable Boats (RHIBs), unmanned surface vehicles (USVs), or unmanned underwater vehicles (UUVs)
    - Four of these can be up to 11 meters in length; four up to seven meters in length
  - Two 57 mm cannon and 360 precision guided attack missiles (Netfire Precision Attack Missiles (PAMs) and Loitering Attack Missiles (LAMs))
  - A SOF detachment, a mechanized Marine rifle company, or small SPMAGTF
- A two-ship division could carry both mine warfare and ASW mission packages, along with inherent counter-boat, SOF/maneuver support, and logistics support capabilities
  - This type of two-ship division would therefore likely lessen the requirement for a large LCS mission module support tail stationed forward

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A Distributed Littoral Frigate Would Appear to Be Quite Fungible Across TFBN Component Fleet Missions

- Provided they can be bought for a reasonably low price, a two-ship LCS Division—or Distributed Littoral Frigate—promises to be a superb GWOT/Global Patrol/ Homeland Defense Asset
  - An LCS division can deal with both irregular boat attacks as well as terrorist employment of mines
  - An LCS division forms a high speed SOF/light maneuver platform, ideal for supporting covert landing parties and small maneuver units along the world's littorals
  - The LCS division, by virtue of its modular design, can be adapted to a variety of additional GWOT missions

- If protected by a Naval Battle Network's extended defenses in defended access scenarios, the LCS Division will likely be able to make important contributions to the Sea-based Power Projection Fleet by:
  - Conducting counter-mine operations;
  - Augmenting Battle Network ASW operations;
  - Protecting the sea base against swarming boat attack;
  - Supporting advance force reconnaissance and raiding operations; and
  - Functioning as a high-speed sea base connector (secondary mission)

- The LCS's ability to employ and control unmanned offboard systems may also allow it to make some contributions in contested access scenarios
  - In any event, it will be an ideal experimental platform for unmanned systems in support of Contested/Denied Access Fleet operations

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However, The LCS's Potential Contribution To the TFBN Depends Critically On Its Affordability

- The GWOT/Global Patrol/Homeland Defense Fleet, possibly more than any other TFBN component, requires large numbers of platforms to accomplish its assigned tasks
- Low system cost, including both construction and operations and support (O&S) costs, are absolutely critical if the required numbers of LCSs are to be bought
  - The LCS's basic hull and combat systems—its "sea frame"—are projected to cost $220 million (.16 average ship equivalents, meaning the Navy can buy six for one ASE)
  - The ship's mission modules are being paid for out of O&S funds
- The key to keeping the prices for these small combatants down depends on:
  - Planning for and executing large, efficient production runs;
  - Building vessels in small Tier II yards that rely on cost control for their existence; and
  - Demanding cost control
- By keeping costs on the sea frame down and encouraging international competition for payload modules, the LCS may become the primary TFBN entry point for many allied navies, especially the smaller ones
  - Building a minimum of two classes of LCSs might provide the needed competition to keep basic costs down and a hedge against the discovery of any class production/operational problems
  - Right now, there are actually four plausible Littoral Corvette options: the LM LCS design; the GD LCS design; the Coast Guard's National Security Cutter, Medium; and the X-Craft, a 1000-ton technology demonstrator sponsored by the Office of Naval Research

LCS Divisions Would Provide Only One of Several Means To Support GWOT-Related SOF/Raiding Operations

- As will be discussed, because of arms limitation treaties, the DoN was compelled to remove four nuclear-powered *Trident* ballistic missile submarines (SSBNs) from fleet service
  - In essence, SSBNs have 24 large, modular payload bays (seven-feet in diameter and 44-feet long), and a relatively large amount of internally reconfigurable mission support space (for a submarine)
  - The large internal payload capacity and relatively long remaining service lives of the excess SSBNs made these four excess hulls attractive candidates for conversion

- Accordingly, the four SSBNs are being converted into conventionally armed cruise missile submarines (SSGNs) in conjunction with their regularly scheduled mid-life Engineering and Refueling Overhaul (ERO)
  - 22 of their 24 mission bays are being converted to carry a Multiple All-up Canister (MAC)—carrying a self-contained seven-cell VLS battery--giving each of the ships a 154-cell VLS battery
  - The total cost of the conversion for four boats was $3.3 billion ($700 million was for non-recurring planning/design costs, making the subsequent average conversion cost approximately $650 million per boat)

- A SSGN appears to be an ideal ***covert*** ISR/strike platform and SOF forward operating base (FOB) for the GWOT/Global Patrol/Homeland Defense Fleet
  - With the Tomahawk, the SSGNs carry 154 individually retargetable, long-range strike weapons with which to engage fleeting terrorist targets

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SSGNs Provide A Covert FOB For GWOT-Related SOF/Raiding Operations

  - Additionally, the boats offer superb SOF-support facilities
    - The boats have space for 66 SOF personnel (with a surge capacity of 102 SOF personnel) and relatively large SOF mission planning/preparation spaces
    - Two of the 24 modular mission bays have been configured to store SOF mission equipment
    - The boats can also carry Dry Deck Shelters (DDSs) to carry additional equipment, as well as a variety of covert insertion means. These include:
      - The Advanced SEAL Delivery System (ASDS); and
      - Swimmer Delivery Vehicles (SDVs)

- Armed with their "Spiral 0" strike and SOF capabilities, SSGNs are fungible across the GWOT/Global Patrol/Homeland Defense, Sea-based Power Projection/Regional Deterrence, and Contested/Denied Access Fleets. Their large modular payload flexibility will improve their utility in the future
  - For example, plans are to replace/augment the single-purpose MACs found in the "Spiral 0" SSGNs with new Flexible Payload Modules, or FPMs
    - In addition to Tomahawks, FPMs are being designed to allow the SSGNs to carry other missiles; moored, bottom, and mobile mines; expendable UAVs; and/or UUVs
  - Work is also progressing on buoyant, self-contained payload capsules that will house and transport "non-navalized" weapons
    - The goal is to develop a capsule that can be released from an SSGN while it is submerged, that will float to the ocean surface and stabilize, and that the fire any weapon in the Joint Multi-dimensional Battle Network inventory. Two designs are being explored:
      - The Broaching Universal Buoyant Launcher (BUBL); and
      - The Stealthy Affordable Capsule System (SACS)

SSNs Provide a Third Platform For GWOT-Related SOF/Raiding Operations

- As will be discussed in the section on the Strategic Deterrence/Dissuasion Fleet, it may be possible to further reduce the SSBN force by two boats. The incremental cost for two further SSGN conversions (four have already been authorized) would be relatively modest
  - The cost of a SSGN conversion is $.65 billion, or .46 ASEs
  - However, the cost of an already scheduled SSBN mid-life engineering refueling overhaul, or ER0, is $.33 billion
  - Therefore, the Incremental cost for converting an SSGN is only $.32 billion per boat

- Six SSGNs with dual crews would allow four boats to be maintained forward, conducting crew swaps at bases in Italy and Guam
  - This would allow two or three SSGNs to be continuously on station in the Mediterranean, Indian Ocean, and Pacific
  - On patrol, the boats would normally perform ISR missions and provide prompt covert GWOT strike coverage; if tasked to support a SOF mission, the boats would likely pull into a friendly port or move to an open-ocean rendezvous point to pick up the mission team

- SSNs will continue to serve as covert ISR/strike platforms and SOF forward operating locations
  - The *Virginia*-class SSN, with its reconfigurable torpedo room and diver lock-out chamber, is particularly suited for this task
  - However, with the appearance of the SSGNs and LCSs, it seems likely that the SSN SOF support role will diminish over time, except for special operations in denied areas

The GWOT/Global Patrol/Homeland Defense Fleet

- ***Tentative recommendations for the GWOT/Global Patrol/Homeland Defense Fleet:***
  - Procure 84 LCSs at a rate of six per year, starting in FY 2008
    - Assuming a crew size of 75, the force's baseline crew requirement, not counting extra mission package crews, is 6,300—a savings of 1,631 active duty manpower billets in comparison to the legacy littoral combatant fleet, and a total manpower savings (including reserves) of 2,906 billets
    - Final manpower savings would depend on the number of "extra" mission modules/mission crews that are procured/maintained
  - Organize the LCS fleet into 42, two-ship LCS divisions, composed of one LM version and one GD version, divided between one Fleet Support Flotilla and two Regional Support Flotillas
    - The Fleet Support Flotilla would consist of two Forward Based Battle Network (FBBN) LCS divisions in Japan (for the J-CVNSG and DESB based there) and a rotational pool of 12 divisions to keep three LCS escort divisions forward (one each for a J-CVNSG, DESB, and either a J-CVESG or TAMD SAG)
    - Regional Flotilla East would consist of four FBBN divisions (two in Italy and two in Bahrain), and a rotational pool of 12 divisions to keep three divisions forward (one off LATAM, one for the West African Station, and one for the Djibouti FOB)
    - Regional Flotilla West would consist of two FBBN divisions in Guam, and a rotational pool of 8 divisions (based in Hawaii) to keep two divisions forward (one for the Singapore CSL, one for the East Asian Station)

The GWOT/Global Patrol/Homeland Defense Fleet (2)

- Two additional LCS divisions would serve as training/experimental platforms for payload development, one on each coast

- Begin operational experimentation/deployments of small Special Purpose MAGTFs designed for distributed maneuver operations from the LCS
  - A reinforced platoon might give the two-ship Distributed GWOT Frigate a landing party capable of small raids and advance force reconnaissance operations

- Convert two further SSBNs to SSGNs, for a GWOT support fleet of six boats
  - Station three boats on each coast, and maintain two boats from each coast forward, conducting crew sea swaps In Italy and Guam
  - Continue to develop the FPMs and buoyant, self-contained payload capsules to improve the flexibility and utility of these platforms
    - As a part of this developmental effort, develop single cell FPMs and buoyant capsules for use in VLS-equipped SSNs

- Maintain a small number of SSNs in the GWOT central theater to serve as covert ISR and strike platforms, covert FOLs for SOF forces, and covert track and trail platforms for maritime targets of high value or interest
  - Focus the SSN force on the Contested/Denied access problem and against the most stressing potential submarine opponent—China (to be further discussed in the section on the Contested/Denied Access Fleet)

The GWOT/Global Patrol/Homeland Defense Fleet (3)

- Ensure than combat and mission packages on USCG (Deepwater) large and medium Maritime Security Cutters are compatible with LCS packages to the greatest degree possible, and vice versa
  - Include USCG cutters in platform counts associated with the National TFBN
- Maintain one TAMD SAG in the Sea of Japan to provide early discrimination of a North Korean missile attack against US territory
  - Continue to refine fleet NMD requirements

Associated TFBN Shipbuilding Plan: Running Tally

• ***Aviation Power Projection Platforms***	**$**3.16 billion, steady state (2.26 ASEs)
• ***"Sea as Base" Maneuver Ships***	$2.2 billion ***through FY14*** (1.57 ASEs)
• ***Surface Combatants***	$2.2 billion ***starting in FY15*** (1.57 ASEs)
GWOT/Global Patrol/Homeland Defense Fleet	
– Six LCS per year (three LM, three GD)	$1.32 billion
– Two SSGN conversions (one per year)	$ .65 billion
– Sub-Total:	$1.32 billion (.94 ASEs) *in non-conversion years* $1.97 billion (1.4 ASEs) ***in conversion years***

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The Contested/Denied Access Fleet

- The Contested/Denied Access Fleet is focused on two operational problems:
  - Breaking into a contested or denied littoral; and
  - Conducting advance force operations in the evolving ***extended range*** guided weapons warfare regime

- It seems likely that this fleet will represent the most "high-tech" and capable component of the future TFBN, but it is not yet clear how fungible the fleet will be for other missions
  - In essence, this fleet is a special-purpose counter-network force, focused on rolling back an adversary's A2/AD network
    - It will likely require a mix of stealthy combatants, unmanned systems, surface combatants that can operate at extreme stand-off ranges, surface combatants with the stealth and toughness to fight and survive inside an enemy's powered missile envelop and survive, or large numbers of "swarming" vessels
  - It is also likely that it will be a relatively small percentage of the TFBN, since it will represent only the leading edge of a Naval Battle Network
    - Its role will be to quickly disrupt/destroy an adversary's A2/AD network so as to give the larger but more vulnerable Sea as Base Power Projection/Regional Deterrence Fleet freedom of action

- As anti-access networks evolve, so too will the requirements for the Contested/Denied Access Fleet
  - Potential future network versus network operations will likely become increasingly more lethal and tactically demanding over time
  - As such, two key near-term "components" of the contested access fleet are a robust research and development (R&D) program and continual Battle Network experimentation

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The Contested/Denied Access Fleet (2)

- Several evident questions should inform the R&D/experimental effort:
  - As discussed earlier, what is the role for surface combatants in the Contested/Denied Access Fleet?
    - What is the value of stealth/protection? Is it better to pursue shaping and/or active coatings? Can much higher levels of protection be reasonably afforded? Are semi-submersible designs a better approach?
    - What about other approaches, such as large numbers of netted, but relatively non-stealthy, unarmored surface platforms?
    - Or should this fleet be composed predominantly of submarines and unmanned systems?
  - How can distributed, unmanned systems be best leveraged against a high-end, hardened, and redundant A2/AD network?
    - Can the TFBN control and tactically employ operationally significant numbers of distributed unmanned systems in the air, on the sea, and under the sea from extended ranges?
    - Can unmanned systems be used to mount a close blockade of an adversary coast screened by a maritime A2/AD network? Can they substitute for SSNs in a contested/denied access environment? Manned aircraft? Surface ships?
  - How can the TFBN best protect itself from attacks by swarms of unmanned systems?
    - Do these swarms represent the future “Long-Lance torpedo?”
  - Can reliable interceptors for maneuvering tactical ballistic missiles fired in an anti-ship/task force mode be deployed and employed?
    - Can these “interceptors” be directed energy weapons?

The Contested/Denied Access Fleet (3)

- As the Total Force Battle Network increasingly concentrates in home waters, Naval Battle Network Experiments with operational units should begin to explore tactical options and to identify new capabilities for dealing with a high-end A2/AD network
  - These Naval Battle Network Experiments would be modeled along the lines of Interwar Era Fleet Battle Experiments, combining war games, analyses, and practical tactical experimentation to develop doctrine and tactics, techniques, and procedures for:
    - Naval network v network warfare; and
    - Battle Network break-in/roll-back operations against a high-end, opposing A2/AD network
  - These Battle Network Experiments should be open to allied navies and well publicized, as part of an overall strategic maritime dissuasion campaign
    - Publicly reporting the positive results of the experiments may dissuade would-be adversaries from pursuing A2/AD networks, or cause them to divert additional resources into defensive systems and away from offensive systems

- Naval Battle Network Experiments should also be informed by aggressive overt and clandestine surveillance, reconnaissance and probing of the evolving Chinese A2/AD network, which is likely to represent the most stressing potential long-term contested/denied access threat
  - This would be the priority peacetime mission of the SSN force (and would dovetail nicely with its focus on ASW, since the Chinese place high emphasis on submarines in their sea denial plans)

The Contested/Denied Access Fleet (4)

- This reconnaissance effort will be aided by the TFBN's new denied access reconnaissance platform, the recently commissioned *USS Jimmy Carter*
  - The Jimmy Carter is a modified *Seawolf*-class submarine, and is "the most expensive single intelligence gathering platform ever built"
  - The boat was cut in half and fitted with a 30-meter, 2,500-ton Ocean Interface Section, or OIS
    - The OIS is an hourglass-shaped section in the pressure hull
    - Inside the OIS in the pressure hull is a reconfigurable command center and a reconfigurable cargo area capable of supporting up to 50 SOF personnel and their equipment
    - Between the pressure hull and the outer hull is a large volume open to sea pressure that can carry a variety of UUVs and remotely operated vehicles (ROVs)
    - Like the SSGN, the *Carter* has a large lock-out chamber for SOF swimmers, can accommodate a DDS, and support both the ASDS and SDV

- Although SSGNs are an ideal GWOT support platform, long-term improvements to the SSGN force should be made with the requirements for the Contested/Denied Access Fleet clearly in mind
  - The SSGN could fill a role as a covert mine reconnaissance/neutralization platform in contested/denied access environments
  - The SSGN could fill a role as covert A2/AD network reconnaissance/neutralization platform in contested/denied access environments, especially for offshore components of an adversary's A2/AD network
  - The SSGN could fill a role as a covert strike base
  - FPMs may effectively convert the SSGN into a "SSUN:" an covert UUV tender, capable of operating and controlling swarms of UUVs in a contested littoral

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The Contested/Denied Access Fleet (5)

- ***Tentative recommendations for the Contested Access Fleet:***
  - Fund a surface combatant R&D/experimentation program with the goal of building several competing stealth surface combatant technology demonstrators
    - The purpose of this program would be to determine if surface combatants are likely to be able to fight and survive in during early contested/denied access operations
  - Fund a distributed, swarming unmanned vehicle R&D program to determine the best employment options and architectures for large numbers of remotely operated, semi-autonomous, and autonomous unmanned vehicles in contested/denied access environments
    - Large numbers of unmanned systems are likely one of the only ways to tackle a sophisticated A2/AD network employing extended-range guided weapons
  - Fund a R&D technology program to examine fleet defense requirements against simultaneous, swarming, multi-dimensional attacks by unmanned systems
    - This is the flip side of the coin for preparing for offensive employment of unmanned systems
  - Fund an R&D technology program to develop fleet tactical ballistic missile defenses, especially against maneuvering anti-ship re-entry vehicles
    - Examine a range of platform options to support future fleet TBM defenses
    - Explore the effectiveness of directed energy weapons for this problem, as well as for broader Battle Network air and missile defense

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The Contested Access Fleet (6)

- Focus the submarine force on the evolving Chinese A2/AD network, and posture it accordingly
  - Increase the number of SSNs stationed in the Pacific to 30+ boats (60-70% of the operational SSN force)
    - Increase the number of SSNs stationed on Guam to a minimum of six boats
      - » Decreasing strategic reaction times by increasing the number of boats based in Guam above six boats must be balanced against the increased risks of a successful surprise attack against Guam (the modern-day equivalent of the Interwar Philippines defense problem)
    - Base up to 24 boats at Hawaii
    - Base all three *Seawolfs* at Bangor
      - » Consolidating the TFBN's primary denied access reconnaissance platform, the *Jimmy Carter,* with the two older, ASW-focused *Seawolfs* will simplify the logistics for this small three-ship class
  - Should the SSBN force be reduced to ten boats (to be discussed in the next section), convert a further two SSGNs, station them in Guam or Hawaii, and focus their efforts on employing swarms of UUVs in contested/denied access environments
    - Fleet experimentation with these and the GWOT SSGNs over the next two decades will inform the shape, character, and numbers of follow-on SSGNXs, preferably a variant of any future attack submarine

Associated TFBN Shipbuilding Plan: Running Tally

• ***Aviation Power Projection Platforms***	**$**3.16 billion, steady state (2.26 ASEs)
• ***"Sea as Base" Maneuver Ships***	$2.2 billion ***through FY14*** (1.57 ASEs)
• ***Surface Combatants***	$2.2 billion ***starting in FY15*** (1.57 ASEs)
• ***GWOT/Global Patrol/Homeland Defense Fleet***	
– Six LCS per year (three LM, three GD)	$1.32 billion
– Two SSGN conversions (one per year)	$ .65 billion
– Sub-Total:	$1.32 billion (.94 ASEs) *in non-conversion years* $1.97 billion (1.4 ASEs) ***in conversion years***
• ***Contested/Denied Access Fleet***	
– Two SSGN conversions (one per year)	$ .65 billion (.46 ASEs) ***in conversion years***

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The Strategic Deterrent/Dissuasion Fleet: SSBNs

- Strategic ballistic missile submarines (SSBNs) represent the most survivable leg of the US nuclear "triad," and underwrite the nation's nuclear strategic deterrence posture
- Between 1967-1981, the Navy operated 41 SSBNs, all built during a remarkably rapid production run between 1960 and 1967
  - This initial SSBN force carried a total of 656 missiles (41 boats x 16 tubes per boat)
  - As mentioned previously, these submarines were dual-crewed to achieve a high force operational availability for strategic deterrent patrols
- Between 1981-1997, these original 41 boats were replaced by 18 *Ohio*-class SSBNs, carrying first the Trident C4, and later the Trident D5, submarine-launched ballistic missiles (SLBMs)
  - This force carried a total of 432 SLBMs (18 boats x 24 tubes per boat)
  - These 18 boats were also dual-crewed for high operational availability
- As mentioned previously, arms limitation treaty limits required the Navy to remove the four oldest *Ohio* SSBNs from service, leaving the current fleet of 14 boats, split equally between the two force operating bases located in Bangor, Washington and King's Bay, Georgia
  - These SSBNs perform a singular mission; they are not fungible across the TFBN's four component fleets
- The remaining 14 SSBNs each require a mid-life engineering and refueling overhaul (ERO) costing approximately $330 million in FY 2005 dollars, or .24 average ship equivalents

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The Strategic Deterrent/Dissuasion Fleet: SSBNs (2)

- With 42-year expected service lives, the first of the remaining 14 SSBNs do not retire until 2026
  - The DoN is conducting long-lead replacement planning for the SSBNs, but this planning is hampered by the high degree of uncertainty of the exact requirements for the future SSBN force is quite difficult to foresee
    - Much will depend on the future course of nuclear proliferation, and the future US strategic deterrent posture
    - Moreover, the TFBN may pursue entirely new approaches, such as mixed nuclear and conventional ballistic missile loads
  - As a result of this uncertainty, this report makes no predictions or recommendations about the future replacements for the current SSBN force

- As previously discussed, the large internal payload capacity and relatively long remaining service lives of the SSBNs removed from service made their hulls attractive candidates for conversion
  - This led to the SSGN conversion program

- Given the diminishing nuclear warfighting requirements, the SSBN force could likely further reduce either its level of alert or number of boats. Two alternatives appear promising:
  - Retain 14 SSBNs but move to one crew per boat, reducing the number of boats on alert
  - Reduce the force to 12 or even ten SSBNs while retaining dual-crewing, to keep the highest possible number of boats in a smaller force on patrol

The Strategic Deterrent/Dissuasion Fleet: SSBNs (3)

- The question over whether the SSBN force could be reduced by a further two or four boats does not turn on nuclear warfighting requirements
  - A ten-boat SSBN force can carry 1,920 warheads, out of a total Nuclear Posture Review warhead goal of 2,250 warheads (10 boats x 24 missiles/boat x up to 8 warheads per missile = 1,920 warheads)
  - With the US planning to retain 500 single warhead Minuteman III Inter-continental Ballistic Missiles (ICBMs) in its nuclear deterrent force, ten boats thus have excess capacity for the nuclear warfighting mission

- Instead, the question over the proper size of the SSBN force is really whether or not the force is large enough and dispersed enough to survive any type of attack or threat and still retain a viable nuclear deterrent force
  - Among the submarine officers and US Strategic Command officers interviewed for this report, there does not appear to be much concern about moving to 12 boats; however, there is some uncertainty over whether or not a ten-boat force would be survivable enough to warrant the risks

The Strategic Deterrent/Dissuasion Fleet: SSBNs (4)

- ***Tentative recommendations for the SSBN Fleet***:
  - Move immediately to a 12-boat SSBN force
    - Initially retain dual crews to maintain higher force availability and to maintain a robust nuclear submarine community
    - A final decision on the force's crewing scheme would be dependent on nuclear alert force posture considerations
  - Complete all 12 mid-life EROs for the SSBN force, at a rate of one per year ($330 million per boat, FY 2005 dollars)
  - Convert the two freed up SSBN hulls to SSGNs
  - Conduct an independent study to determine if the SSBN fleet can be further reduced to 10 boats with acceptable degrees of risk
    - If so, this would free up an additional two hulls for possible SSGN conversions
  - Start long-lead class replacement planning for the SSBN force
    - Should mixed conventional/nuclear missile loads be considered in the future, perhaps a combination SSBN and nuclear-powered attack submarine (SSN) might be possible
    - Should a single-purpose SSBN still be required, the size and alert posture of the SSBN force, and the size of the boat itself, will be determined by the future nuclear warfighting force posture and the size of the follow-on to the Trident D-5 SLBM carried by the current SSBNs

The Strategic Deterrent/Dissuasion Fleet: SSNs

- The nuclear-powered fast attack submarine remains the "capital ship" for the open-ocean sea control mission: it can sink anything on or under the oceans, with a high degree of stealth and invulnerability
  - A powerful fleet of fast attack boats is likely the best means to dissuade an adversary from entering a global, *open-ocean* naval competition with the US. SSNs are thus included in the Strategic Deterrent/Dissuasion Fleet. As Jackie Fisher wrote:

    "My beloved submarines magnify the power of England seven time more than present…What is the use of battle ships as we have hitherto known them? NONE!"

- As implied by Fisher's statement, submarines represent a powerful deterrent *and* an equally powerful threat. Therefore, regardless of challenger or circumstances, given the criticality of sea-based maneuver to the evolving Joint Global Power Projection Network, the TFBN cannot afford to lose its dominant position of undersea superiority
  - The oceans provide the US with a modern day equivalent to the Roman road network, giving US Joint forces tremendous global reach and an enormous strategic advantage
  - ***Job 1 for the SSN fleet is therefore protection of the virtual US sea base from underwater attack*** (in other words, ASW, as opposed to intelligence, surveillance, and reconnaissance, or ISR)

- Moreover, SSNs are among the most fungible platforms in the TFBN, performing important functions for the sea-based power projection and contested access fleets, as well as the GWOT/Global Patrol/Homeland Defense fleet
  - US SSNs have a respectable modular payload capacity and two basic launch systems: 21-inch torpedo tubes and VLS cells. The tubes fire a variety of torpedoes, mines, UUVs, and encapsulated weapons (e.g., Harpoon ASCMs and Tomahawk strike missiles); the VLS cells now carry only Tomahawk strike missiles

The Strategic Deterrent/Dissuasion Fleet: SSNs (2)

  - 19 pre-VLS *Los Angeles*-class SSNs have a payload capacity of four tube-mounted torpedoes/encapsulated weapons and 22 stows. Keeping one stowage space free to allow swap outs of weapons carried in the tubes gives these boats a notional patrol load of 25 weapons
  - 31 VLS-equipped *Los* Angeles-class SSNs carry the same 25 weapons in the their torpedo rooms, and an additional 12 VLS cells, for a total of 37 weapons
  - The two *Seawolf* SSNs carry no VLS, but have eight 26.5-inch torpedo tubes that allow quiet "swim out" of 21-inch weapons; they carry a total of 50 tube-launched weapons
  - He new *Virginia*-class SSNs carry 27 weapons in their torpedo rooms and 12 VLS cells, for a total of 39 weapons

- The current fleet thus consists of 53 SSNs; with an average hull life of 33 years, maintaining this fleet would require a build rate of approximately 1.60 boats per year, or approximately five boats every three years (e.g., a 2-1-2 procurement profile)

- Unfortunately, the *Virginia*-class SSN currently in production costs $2.5 billion a copy, or 1.8 ASEs
  - Naval planners had hoped the *Virginia* would be far less expensive than the *Seawolf* it was designed to replace; this hope did not materialize
  - Moving to two boats in *any* year on a steady state ship-building budget of $10 billion a year is thus prudent only if the US TFBN is in imminent danger of losing undersea superiority

- Given these conditions, the key questions for TFBN planners are:
  - How many US attack submarines are required to retain a comfortable level of undersea superiority?
  - How can the DoN affordably build them?

The Strategic Deterrence/Dissuasion Fleet: SSNs (3)

- With regard to the first question, pursuing a submarine capability is a daunting proposition for any navy, especially a small one
  - To ensure the operational availability of just one boat, a minimum force size of three or four boats is necessary
  - Nuclear boats are out of reach for all but the most capable and richly resourced navies, as are air independent propulsion (AIP) diesel boats
  - Most small navies are therefore purchasing either new non-AIP diesel boats, or used submarines. Both approaches provide the least-cost, least-capability option
  - Exacting submarine maintenance standards require substantial submarine force operations and support (O&S) expenditures, especially for older boats. Moreover, training requirements are demanding, although modern combat systems and wake-homing torpedoes make modern torpedo attack training less of a problem
  - Ensuring a self-sustaining, skilled submarine community (growing qualified submarine officers and enlisted) is a challenging proposition for any navy

- For these reasons, the world-wide submarine fleet is shrinking
  - Many boats purchased during the Garrison Era are reaching the end of their ESLs
  - The vast majority of world navies will not replace their aging subs on a one-for-one basis. Some navies will likely retain only a small residual force kept primarily for national pride; still others will give up their submarine capability completely
    - For example, the Royal Navy is reducing its submarine fleet from 12 to 8 SSNs
    - The Royal Danish Navy just gave up its submarine force in order to improve its expeditionary out-of-area capabilities

The Strategic Deterrence/Dissuasion Fleet: SSNs (4)

- Moreover, despite predictions to the contrary, super-quiet AIP diesel submarines do not appear to be rapidly proliferating
  - The cost of a German Type 214 AIP boat is approximately $.5 billion, meaning even a two-boat force represents a minimum expenditure of $1billion
  - There are nine AIP diesel boats operating in the world today (3% of all conventional boats); a further 12 are under construction. All 21 of these AIP boats are operated by US allies or strategic partners
    - (Note: some analysts believe the just-launched Chinese *Yuan*-class SSG may have an AIP plant, and Russia is marketing AIP subs for export)

- With these facts in find, one way to approach the question of how many subs are enough is to ignore the total number of submarines in the ROW fleet and instead pursue a two- or three-Navy standard
  - As indicated earlier, a hypothetical combined Russian-Chinese sub coalition would present the most stressing (if unlikely) baseline for ASW planning
  - These navies currently operate a total of 93 tactical submarines (27 nuclear, 66 diesel)
    - Of these, 22 (and an additional number in reserve) are obsolete Chinese *Romeos* near the end of their useful service lives, and an additional 20 are only slightly more modern Chinese *Mings,* an updated version of the Romeo; the Chinese will likely try to replace these boats as rapidly as possible
  - A notional mid-term "front-line" force might thus consist of 27 nuclear boats (23 Russian SSNs and SSGNs, 4 Chinese Type 093 SSNs), 35 quiet diesels (13 Russian, 12 Chinese *Kilos,* 10 Chinese *Songs*), and 20 super-quiet diesels (20 Chinese *Yuans or* Russian *Petersburg/Ladas)*, for a total of 82 boats

The Strategic Deterrence/Dissuasion Fleet: SSNs (5)

  - Focusing on the ASW problem of countering an adversary's submarine attacks against the virtual US sea base, and assuming the US SSN fleet would remain steady at 53 boats,, the comparable mid-term force ratio would be one US SSN per every 1.55 Russian/Chinese boats

- At the end of the Cold War (1990), the US had 96 SSNs. These boats faced a force of 267 Soviet tactical submarines, including 50 SSGNs, 81 SSNs, 16 SSGs, and 120 SSs. This represented a force ratio of one US SSN per 2.78 Soviet subs, of all types (not including the large fleet of Soviet SSBNs, which would have made the ratio much worse)
  - As discussed earlier, this means the current US submarine fleet enjoys nearly twice as good a force ratio using a two-navy standard as it did during the Garrison era using a one-Navy standard

- Assuming a 33-year US sub ESL, and projecting a long-term steady state Russian/Chinese sub fleet that levels off at 85 boats (assuming an average build rate of 2.83 boats per year with 30-year ESLs), the following US submarine building profiles would result in the following two-navy force ratios over time:

– US build profile:	2-2-2	2-1-2	1-1-2	1-1-1
Steady state force:	66	55	44	33
Force ratio:	1:1.23	1:1.55	1:1.93	1:2.75

- In other words, even in the unlikely event of Russian-Chinese naval coalition, and even if the US were to build only one submarine per year, it would likely never face a more unfavorable ratio of submarine forces than it accepted during the Garrison Era
  - Of course, the ratio and situation would dramatically improve if the US SSN fleet was concentrated against only one of the two fleets

The Strategic Deterrence/Dissuasion Fleet: SSNs (6)

- Force ratios do not tell the whole story, however. One reason the US could confidently accept a large disparity in the US-Soviet sub ratio during the Garrison Era was that up until the very end of the era, US subs generally enjoyed a major acoustical advantage over Soviet boats
  - After the Walker spy ring alerted the Soviets to this advantage, the Soviets made rapid strides in submarine acoustic quieting; these advances negated to a great degree the effectiveness of the US ocean surveillance network, and changed the level of confidence that US naval planners had in their level of undersea superiority
  - Modern nuclear-powered attack submarines, AIP diesels, and even the most modern generation diesel-powered SSKs all boast exceptional quieting:
    - The *Kilo*-class SSK used by both the Russian and Chinese navies is reported to have an acoustical signature equivalent to early US *LA*-class SSNs
    - The next generation Chinese *Yuan* and Russian *Lada/Petersburg* SSKs are expected to be even quieter
  - Confronting a sub force with near-acoustical parity will require far more favorable force ratios than those US planners were willing to accept during the Garrison Era

- On the other hand, the number of denied areas requiring SSN-only ASW operations appears to be declining; Multi-Mission Maritime Aircraft (MMA) and the Broad Area Maritime Surveillance (BAMS) systems, operating in areas where the US enjoys air superiority, will likely lighten the ASW load on the future SSN force

The Strategic Deterrence/Dissuasion Fleet: SSNs (7)

- Moreover, given the size and age of current SSN fleet, even with a serial production rate of only one *Virginia* SSN per year, the SSN force size will remain relatively constant over the near- to mid-term
  - Up until the last quarter of calendar year 2004, there were 20 pre-VLS *Los Angeles* class subs in a fleet of 53 SSNs; these boats were all commissioned between 1976 and 1985
    - With 33-year ESLs, these boats will retire all between 2006 and 2018
  - The first *Virginia*-class SSN was commissioned in 2004, replacing one of the pre-VLS *LA*-class boats; a further nine are under construction/authorized through FY 2008
    - Assuming a continuing steady state rate of one boat per year after FY 2008, by FY 2018, 20 *Virginias* should be authorized and 17 in commission
  - In other words, given no changes to the submarine build rate, the force will remain relatively steady at 50-53 boats through 2018
    - Assuming the aforementioned 85 boat combined Russian/Chinese fleet, this would result in a force ratio no worse than of 1 US SSN for every 1.7 Russian/Chinese boat

- That said, given no alterations in the SSN build rate, the US sub force will see a dramatic decline in fleet numbers after 2018 as the 31 VLS-equipped *Los Angeles*-class and two *Seawolf*-class SSNs begin to retire
  - These 33 ships were all commissioned between 1985 and 1998, meaning the force will lose all 33 boats between 2018 and 2031, at an average rate of five boats every two years
  - Continuing to build only one SSN per year would thus trigger a steep drop in fleet numbers: the fleet would drop to 28 boats in 2028 before climbing back up and leveling off at a steady-state force level of 33 SSNs in 2033

The Strategic Deterrence/Dissuasion Fleet: SSNs (8)

- On balance, then:
  - ***The near- to mid-term threat*** does not appear to justify an *immediate* increase in the yearly submarine building rate of one $2.5 billion *Virginia*-class submarine per year
    - Given the qualitative advantages the US fleet now appears to enjoy, the contemporary two-navy force ratio suggests that the US is in no *imminent* danger of losing undersea superiority
    - However, the US must retain the option to move immediately to two boats a year in the event of a concerted submarine challenge

- To hedge against/prepare for a major submarine challenge over the longer term, or to decrease operational risk by seeking improved future force submarine ratios, TFBN planners must begin to plan for a greater, but more affordable, submarine build rate
  - Given fiscal realities and the high costs of the current boat, this implies the need for a concerted design effort to design and build a future "undersea superiority system"—dubbed USSX—that costs much less than the $2.5 billion price tag of a *Virginia* SSN
  - As a result, it is unlikely that the *Virginia* class will ever reach the 30 boats currently planned
    - For planning purposes, this report assumes the *Virginia* class will number no more than 20 boats, and that the TFBN will start to build USSXs at the rate of two per year or three every two years *no later than 2019*
      - The 20 *Virginias* will replace the 20 pre-VLS equipped *LA*-class subs

The Strategic Deterrence/Dissuasion Fleet: SSNs (9)

- In the meantime, every effort must be made to reduce the costs on the *Virginia*-class SSN
  - Although being procured at the rate of only one boat per year, the work is being split between two yards (Electric Boat and Newport News Shipbuilding)
  - This unique teaming agreement was made to maintain national submarine building capacity, in expectation of building a minimum of two submarines per year
    - In the event, however, the high costs of the *Virginias* prevented a move to two submarines a year
  - One way to reduce costs therefore would be to consolidate submarine building in one yard, or to form a new single submarine construction company
    - This would allow the most efficient construction of submarines, for the lowest cost

The Strategic Deterrence/Dissuasion Fleet: SSNs (9)

- ***Tentative recommendations for the SSN Fleet:***
  - Continue to build *Virginia*-class SSNs at a rate of one per year
    - To hold the cost of the boat to $2.5 billion, consider consolidating submarine production in one yard to pursue efficiency and learning curve savings
    - Whether or not the decision is made to consolidate production in one yard, maintain the industrial capacity to increase production to two or three boats per year, to hedge against a serious near- to mid-term submarine challenge
  - Commence an immediate design effort with the goal of developing a new "Undersea Superiority System," or USSX, with at least *Virginia*-class capabilities at .5-.67 the displacement, with a goal of moving to serial production of two boats per year or three boats every two years no later than FY 2019
    - Displacement is closely tied to cost; decreasing displacement would therefore lower the USSX's cost
    - In the meantime, study ways to increase the service lives of the 31 VLS-equipped *LA*-class and two *Seawolf*-class SSNs to help delay the SSN "bathtub" expected in the mid-2020s
  - Conduct experiment with distributed and swarming UUVs to determine if UUVs can be used as a substitute for SSNs for certain missions, especially close blockade and offensive operations in contested/denied access scenarios
  - Closely monitor Russian and Chinese submarine production rates to provide early warning of potential long-term changes to submarine force planning ratios

Associated TFBN Shipbuilding Plan: Running Tally

- ***Strategic Deterrence/Dissuasion Fleet***
  - One *Virginia*-class SSN per year: $2.5 billion
  - One SSBN ERO per year: $ .33 billion
  - Sub-total: $2.83 billion (2.01 ASEs)
    :

Naval Auxiliaries and Support Ships

- The combined ***Combat Logistics Force*** (CLF) includes both active duty ships and ships from the Naval Fleet Auxiliary Force (NFAF), which are operated by the Military Sealift Command (MSC) and crewed by civilian mariners. The current fleet includes:
  - A seven-ship "station fleet" consisting of three active Fast Combat Support ships and four NFAF Fast Combat Support Ships, known as AOEs and T-AOEs, respectively;
    - These seven large, "triple product ships" are fast enough (26 kts) to keep up with carrier strike forces and are designed to provide the carrier and its escorts with fuel, ammunition, and dry stores
    - A "T" in a ship's designation means that it is assigned to the MSC
  - A 26-ship "shuttle fleet" consisting of:
    - 14 replenishment tankers (T-AOs);
    - Six ammunition ships (T-AEs); and
    - Six stores ships (T-AFSs)
  - Manned by civilian mariners, these ships maintain the highest operational tempo (OpTempo) in the Battle Fleet, rivaled only by SSBNs, which are manned by dual crews

- The DoN originally planned to replace the three active AOEs, and six T-AEs and six T-AFSs with 12 new Advanced Auxiliary Dry Cargo Ships (T-AKEs)
  - The T-AKEs have a modular dry cargo payload, allowing it to carrying either ammunition or dry stores, in addition to 18,000 barrels of fuel

- The FY 2006 budget indicates that a new class of four T-AOEXs will replace the three active AOEs, resulting in a final "station fleet" of eight T-AOEs/T-AOEXs
  - This force supports the new Fleet Response Plan, which calls for the TFBN to be able to surge six carrier strike groups within 30 days, and an additional two within 90 days

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Naval Auxiliaries and Support Ships (2)

- At the same time, the once planned 12-ship T-AKE buy will be reduced by one ship, resulting in an 11-ship class
  - The T-AKE is designed to be a two-product shuttle ship
  - However, when teamed with a fleet oiler, a T-AKE/T-AO combination will be able to perform as a distributed station ship for J-CVESGs and other task groups (note: these ships can steam at 20 kts, meanings they could not stay up with a CVNSG)

- T-AOEXs are the most expensive CLF ships; their projected costs are on the order of $1 billion
  - Most other CLF ships cost less than $.5 billion, since they are built to commercial standards,
    - For example, a T-AKE costs $380 million

- With the recapitalization and expansion of the TFBN's station ship fleet, and the ongoing recapitalization of the TFBN's ammunition and dry store ships with the T-AKE, the only other CLF ships in need of replacement are the fleet oilers
  - However, the T-AO fleet is relatively young; the oldest ship in the TFBN is 18 years old
  - With an expected ESL of approximately 40 years, TFBN planners do not need to start recapitalizing the oilier fleet until the latter part of next decade or the early 2020s
  - Current plans are to expand the size of the T-AO fleet to 17 ships

- However, as discussed in the section on the "Sea as Base" Maneuver Fleet, there is a requirement for a new type of CLF ship—the T-AKA—that is designed to conduct "underway replenishment" of Joint forces operating ashore

Naval Auxiliaries and Support Ships (3)

  - In effect, these ships would be floating automated distribution centers, capable of selectively offloading ammunition, containers, supplies, and other cargo into both aerial and surface connectors
  - As discussed earlier, The T-AKA would likely fill a DoN maneuver sea base need, and Defense Logistics Agency, Army, and Air Force needs as well, since all of these organizations/services plan to purchase additional afloat prepositioning ships and supply distribution centers
  - A variant of the LMSR or the T-AKE would likely provide the most cheapest and effective alternative for this ship

- The NFAF also operates the previously discussed T-AVBs, and two large Fleet Hospital Ships, or AHs; both ships will need to be replaced over time
  - As was mentioned, replacing the two T-AVBs with Maersk S-class conversions might be a cost-effective approach
  - The AHs are converted tankers
    - One ship is maintained on each coast, ready to be activated within four days
    - These vessels will need to be replaced over time
    - A key requirement for future AHs will be to handle casualties that have been contaminated in a WMD environment
      - The LPD-17, with this capability already built into the ship, may thus be one logical platform for a future TFBN hospital ship

- The delayed recapitalization requirements for the T-AO fleet means that the T-AKAs, T-AVBs, and AHs could be built after the T-AOEX production run with no disruption to existing T-AO shipbuilding plans

Naval Auxiliaries and Support Ships (4)

  - Given an expected cost on the order of $1 billion for the T-AOEX, it is unlikely that more than one of these ships will be built per year, meaning that the last T-AOEX will likely be authorized in FY 2012
  - The oldest oiler in the fleet, the *Henry J. Kaiser*, was placed in service in 1986. Assuming a 40 year ESL, the ship will have to be replaced in 2026
  - This suggests a 10-11 year pause in CLF ships that could be used to build T-AKAs, T-AVBs, AHs, and other fleet auxiliaries and support ships

- The 33-ship Combat Logistics Force is augmented by an 11-ship ***Mobile Logistics Force*** (MLF). Together, these 44 ships represent the last remnants of the vast sea-based fleet trains developed during World War II to sustain the Battle Fleet's long attack across the Pacific. The MLF includes:
  - Five fleet tugs (T-ATFs),
  - Four salvage vessels (ARSs); and
  - Two submarine tenders (ASs)

- Distributed Naval Battle Networks, operating forward in the Joint Expeditionary Era, likely will require additional tender support
  - A new multi-purpose tender—to provide forward rearming of VLS cells, hasty voyage repairs, support to deployed nuclear-powered submarines, and support for deployed LCS divisions—appears to be an emerging requirement
  - A five-ship tender force, distributed forward to support the five "fleet stations" from Ascension Island, Italy, Diego Garcia, Palau, and Guam, would appear to be a sufficient force
    - Once again, because of their large, easy-to-modify hulls, a LPD-17 variant might be a good candidate for these tenders

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Naval Auxiliaries and Support Ships (5)

- The TFBN also operates four command ships: two LCCs, originally designed to be the command ships for larger amphibious landings; and two converted amphibious landing ships
  - LCC 19, the *Blue Ridge*, is the command ship for the US Seventh Fleet, and is homeported in Japan
  - LCC 20, the *Mount Whitney*, is the new command ship for the US Sixth Fleet, and is homeported in Italy
  - AGF 3, the *La Salle* (a converted LPD), was the former command ship for the US Sixth Fleet, and is being decommissioned
  - AGF 11, the *Coronado (also* a converted LPD), is the command ship for the US Third Fleet, located on the West Coast

- At one time, these four ships were scheduled to be replaced by a new JCC(X) command ship, but this ship fell out of the DoN's long-range shipbuilding plans
  - A sea-based command and control platform for Joint Power Projection Operations still appears to be a valid requirement
  - As a part of Joint Power Projection Sea Base, the ship should have both air and surface connector interfaces
    - An LPD-17 version of the JCC(X) has already been considered, and would appear to be a logical alternative

- The TFBN also operates four ocean surveillance ships, or T-AGOs
  - These ships tow the Surveillance Towed Array Sensor System, or SURTASS—a long passive acoustic array used to help localize enemy submarines
  - The four T-AGOs are all that remain of a planned force of 27 ships
  - The four will all operate in the Pacific, focused on the Chinese submarine fleet

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Naval Auxiliaries and Support Ships (6)

- The MSC would also operate the aforementioned MPF(E) and MPF(F) squadrons
  - To save near-term costs, the TFBN would retain the MPF(E) after buying out the lease, and reconfigure them into four, 3-ship squadrons configured for Irregular warfare tasks
  - The MPF(F) ships will likely be the most expensive support ship built, with costs potentially as high as $1.5 billion per ship

- Naval Auxiliaries and Support Ships are all gradually being transferred to the MSC
  - The last three active CLF ships will be replaced by four new T-AOEXs
  - The T-AVBs and AHs are manned by civilian mariners
  - All of the MLF ships, with the possible exception of the tenders, will soon be operated by the MSC
    - The five fleet tugs have already transferred to MSC
    - The four ARSs are in the process of being transferred to the MSC
    - There appear to be no plans to convert the two submarine tenders to civilian manning
  - Key parts of the crews on the TFBN's command ships are now being manned by MSC civilian mariners
  - All ocean surveillance ships are operated by the MSC, although they retain small active duty Navy detachments
  - These moves are designed to save O&S costs, and, like the dual crewing scheme of the SSBNs, to increase the operational availability of these assets

- The total amount of shipbuilding dollars allocated for the procurement of naval auxiliaries and support ships should be no more than $1.5 billion a year—which would cover the cost for the most expensive auxiliary—the MPF(F)

CSBA

Naval Auxiliaries and Support Ships (7)

- ***Tentative recommendations for the NFAF and Fleet Support Fleet:***
  - Complete the planned recapitalization of the legacy AOE, T-AE, and T-AFS force (15 ships) with four T-AOEXs and 11 T-AKEs in FY 2012
  - Replace the two T-AVBs with Maersk S-class conversions in FY 2013
  - Begin design of a new T-AKA sea base selective offload cargo ship
    - The class would be built starting in FY 2014, in the intervening years between the completion of the T-AOEX class and the start of the T-AOX class, with a target cost of no more than $.5 billion
    - A T-AKE variant should be one alternative explored
  - Based on the results of Joint experimentation, build a MPF(F) squadron after the completion of the T-AKA production run
    - The costs of these ships should not exceed one ASE
  - Based on a review of requirements, alternatives, and costs, replace the two AHs with LPD-17 variants
  - Based on a review of requirements, alternatives, and costs, replace the four fleet command ships with JCC(X)s, based on the LPD-17

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Naval Auxiliaries and Support Ships (8)

- Based on a review of requirements, alternatives, and costs, build five multi-purpose TFBN support tenders, based on the LPD-17 hull, to be located at: Ascension Island; Italy; Diego Garcia; Palau; Guam

- To increase the availability of assets and to accrue additional manpower savings, continue the ongoing transfer of all support ships to the NFAF

Associated TFBN Shipbuilding Plan: Final Tally

- ***Aviation Power Projection Platforms*** — **$**3.16 billion, steady state (2.26 ASEs)
- ***"Sea as Base" Maneuver Fleet*** — $2.2 billion ***through FY14*** (1.57 ASEs)
- ***Surface Combatants*** — $2.2 billion ***starting in FY15*** (1.57 ASEs)
- ***GWOT/Global Patrol/Homeland Defense Fleet***
  - Six LCS per year (three LM, three GD) — $1.32 billion
  - Two SSGN conversions (one per year) — $ .65 billion
  - Sub-Total: — $1.32 billion (.94 ASEs) *in non-conversion years*; $1.97 billion (1.4 ASEs) ***in conversion years***
- ***Contested/Denied Access Fleet***
  - Two SSGN conversions (one per year) — $ .65 billion (.46 ASEs) ***in conversion years***

Associated TFBN Shipbuilding Plan: Final Tally (2)

- ***Strategic Deterrence/Dissuasion Fleet***
  - One *Virginia*-class SSN per year: $2.5 billion
  - One SSBN ERO : $ .33 billion
  - Sub-total: $2.83 billion (2.01 ASEs)
- ***Naval Fleet Auxiliaries, Support Ships, and DoN High Speed Connectors*** $1.4 billion (1.00 ASEs)
:
- ***Subtotal*** **$10.91 billion (7.79 ASEs)**
  $11.23 billion (8.02 ASEs) in SSGN conversion years

Note that this shipbuilding plan, reflecting difficult design choices such as building only one *Virginia*-class SSN per year and delaying the DDX and CGX, Still exceeds the target steady state shipbuilding budget by approximately 10 percent

Even so, this fleet appears to be approximately one-third less expensive than the Current Navy shipbuilding plan

This exercise illustrates how critical it is to get the cost of the future ASE down to at least $1 billion

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A "500+ Ship" Naval Platform Architecture for the National Total Force Battle Network

- **12** (10?) SSBNs
- **60** nuclear-powered submarines, including:
  - 53 SSNs (dropping slightly over the next 12 years)
  - 6 (8?) SSGNs
  - 1 Special Mission Submarine
- **15** aviation power projection platforms, including:
  - 10 J-CVNs
  - 4 J-CVEs
  - 1 J-AFSB
- **84** (86?) AEGIS/VLS surface combatants, including:
  - 22 CG-52s
  - 34 (36?) DDG-79s
  - 28 DDG-51s
- **84** LCSs
- **91+** USCG Deepwater Cutters
- **54** "Sea as Base" maneuver platforms, including:
  - 8 LHD-1s
  - 24 LPD-17s
  - 16 MPFs
  - 4 T-LSVs
  - 2 upgraded T-AVBs
- **68** NFAF ships, including:
  - 8 T-AOE/T-AOE(X)s
  - 11 T-AKEs
  - 17 T-AOs
  - 8 (?) T-LKAs
  - 4 JCCXs
  - 5 Fleet Support Tenders
  - 4 Salvage Ships
  - 5 Fleet Tugs
  - 4 Ocean Surveillance Ships
  - 2 AHs
- **35+** Prepositioning and surge sealift ships

The "+" In the "500+" Number Indicates the Impact That Future High-Speed "Sea as Base" Connectors May Have on TFBN Numbers

- Note that the notional platform architecture for the DoN's Total Force Battle Network does ***not*** include high speed connectors such as the Joint High Speed Vessel, or the LCH(X), or the LCAC(X)
  - Should these platforms be built with broader TFBN requirements in mind, with modular mission stations and common module interfaces, they would contribute greatly to the TFBN
  - Should that be the case, it would be logical to count these connectors within the overall count for naval platforms associated with the TFBN

The "500+ Ship" National Total Force Battle Network Facilitates the Formation of Greater Numbers of Smaller, Distributed Network Battle Groups

- 11 deployable Carrier Strike Groups → Nine deployable J-CVNSGs; Four J-CVESGs; One J-AFSB
- 12 Expeditionary Strike Groups → Eight DESBs and 24 Maneuver Action Groups (one DDG-51/79 + one LPD-17)
- Three MPF(E) Squadrons → Four MPF(E) Squadrons (Irregular Warfare); One MPF(F) Sea Base Squadron; Two USMC AFSBs (formerly T-AVBs)
- Four SSGNs → Six to eight Covert GWOT Strike Bases

The TFBN's Naval Platform Architecture Includes a Variety Of Modular Platforms, Which Provide TFBN Planners With Immense Flexibility

	Large Payload	Medium Payload
Subs	**SSGN/SSUN** Strike, SOF(+), UUV, UAV	**SSN** ASW, Strike, SOF(-), UUV(-)
Aviation PP Ships	**J-CVN** CTOL a/c, J-UCAS	**J-CVE** STOVL a/c, Tiltrotor (?)
Battle Line Combatants	**CG-52** AAW, ASuW, ASW, Strike	**DDG51/79** AAW, ASuW, ASW, Strike
GWOT Combatants	**LM/GD LCS, USCG Cutters**	**SOF,USCG Patrol Boats**
	Various modular mission payloads	
Sea as Base Maneuver Combatants	**LHD** R/W a/c, STOVL a/c	**LPD** R/W a/c
	Various modular Marine payloads	

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The Supporting Industrial Base

- Pursuing a competition strategy of enduring maritime supremacy demands both a vibrant R&D and experimentation program ***and a solid shipbuilding industrial base***
  - Rationalizing the defense industrial base is thus a critical part of the DoN's maritime competition strategy, and should be the subject of immediate consideration and deliberation by Congress, DoD, and the DoN
  - While this report will not make explicit recommendations about the shipbuilding industrial base, it will attempt to illustrate the broader issues involved

- Once the Congress decided to *maintain* a Navy in 1794, one of its first decisions was to sanction an "inefficient" shipbuilding infrastructure
  - The Navy's first six frigates were built in the nation's first six naval shipyards—to ensure broad political buy-in and support for the cost of building and maintaining a fleet
  - The willingness of Congress to tolerate an "inefficient" shipbuilding industry is thus as old as the Navy itself

- Now, over 210 years later, the current national shipbuilding complex also includes six large "Tier I" shipyards, owned by two large defense companies
  - General Dynamics owns, manages, and operates:
    - Bath Iron Works (BIW), located in Maine, which builds surface combatants
    - Electric Boat (EB), located in Connecticut and Rhode Island, which builds submarines; and
    - The National Steel and Shipbuilding Company (NASSCO), located in California, which builds large fleet auxiliaries and sealift ships
  - Northrop Grumman owns, manages, and operates:
    - Ingalls, located in Mississippi, which builds surface combatants, amphibious ships, and USCG cutters

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Supporting Industrial Base (2)

  - Avondale, located in Louisiana, which builds amphibious ships, auxiliaries, and sea lift ships; and
  - Newport News, located in Virginia, which builds submarines and aircraft carriers

- These six large Tier I yards are augmented by smaller "Tier II" yards that specialize in ship repair and/or which build smaller combatants

- Numerous studies have indicated that the six Tier I yards have "exorbitant excess capacities," which contribute to the rising costs of TFBN warships, primarily because of high industrial overhead costs
  - These capacities are the result of "cabotage laws and *fluctuating national security acquisition policies that force the shipbuilders of combatants to retain capacities to address required surges in coming years*" (emphasis added)
  - This last point is especially important: the DoN contributes greatly to the problem of "exorbitant capacities" by its consistent tendency to portray overly optimistic ramp ups in ship production in budget "out-years"
    - For example, the FY 2005 budget submission stated the DoN intended to buy 17 ships in FY 2009: two SSNs; three DDXs; one LPD-17; six LCSs; two T-AOEXs; three MPFs
    - The FY 2006 budget submission states the DoN now intends to buy nine ships in FY 2009: one SSN; one DDX; no LPD-17s; five LCSs; one T-AOEX; one MPF
  - One way to force the DoN to make more realistic long-term shipbuilding plans is to establish a fiscally prudent *steady state* shipbuilding planning budget
    - This will force DoN planners to make more realistic out-year budget plans, and may contribute to more stable plans and more realistically aligned industrial capacities

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Supporting Industrial Base (3)

- More realistically aligned industrial capacities should also result after an associated Total Force Battle Network transition strategy is developed. As was outlined in this report, one such plan would be to:
  - Maximize current TFBN capabilities and minimize non-recurring engineering costs on new platforms by maintaining and pursuing hulls in service, in production, or near production that can meet near-to-mid-term GWOT requirements and that are capable of operating in defended access scenarios against nuclear-armed regional adversaries
  - Identify and retain or build *large numbers* of common hulls that have a large amount of internal reconfigurable volume, or that can carry a variety of modular payloads, or that can be easily modified or adapted to new missions, over time
  - Minimize average ship production costs *for warships that cost more than $1.4 billion*, or one average ship equivalent, by consolidating production in a single yard, pursuing learning curve efficiencies associated with stable class production runs, and requesting efficient multi-year procurement contracts whenever possible
  - Minimize average ship production costs *for warships and fleet auxiliaries that cost less than one average ship equivalent* by emphasizing competition, shifting production to smaller Tier II yards, building large, efficient production runs, and enforcing ruthless cost control

- This *interim* transition strategy informed the transition plan developed in this report, which helps to explain why:
  - A steady state shipbuilding target of $10 billion a year (FY 2005 constant dollars) shaped the final plan
  - The CVN-21 and the LHA(R)—both of which are nearing production and "good enough" for near-to-mid-term TFBN requirements—were selected to be the TFBN's newest aviation power projection platforms

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Supporting Industrial Base (4)

- The LHD and LPD-17—both of which are in production and well suited challenges in a defended littoral—were chosen to be the basic building blocks for the future "Sea as Base" Maneuver Fleet
- A Strategy of the Second Move was recommended for the surface combatant fleet
- Both versions of the LCS were recommended for serial production
- Additional SSGN conversions were pursued
- The final shipbuilding plan included only one *Virginia*-class SSN per year

- However, the transition plan was also influenced by a *longer-term* strategy ***to try to reduce the costs of TFBN warships***
  - Reducing the cost of an "average ship equivalent" from $1.4 billion to $1 billion would increase the potential steady state fleet from 210-225 ASEs to 300-350 ASEs
  - As a result, the transition plan recommends an immediate design competition to develop a new "undersea superiority system," or USSX, that has equal capabilities to, but half to two-thirds the displacement of, a *Virginia*-class SSN
  - The transition plan also recommends a surface combatant R&D and technology demonstrator program that aims to develop a new, modular future surface combatant (SCX)—or family of combatants—that can be built at a minimum rate of two to three hulls a year on a steady state surface combatant shipbuilding budget of approximately $2.2 billion a year

- The point of these discussions is to emphasize that *any* TFBN transition strategy will have huge implications for the shipbuilding industrial base. For example, the strategy developed in this report suggests that TFBN planners might wish to:
  - Maintain production of aircraft carriers at Newport News;
  - Consolidate production of large surface combatants and amphibious warships at Ingalls;

Supporting Industrial Base (5)

- Such a move would be guided by the building sequence of LPD-17s and SCXs recommended in this report, and the fact that Ingalls builds a wider variety of ships than BIW (meaning its overhead can be spread over a larger number of platforms)
  - Ingalls builds the LPD-17 and the LHD, the DDG-79, and USCG Deepwater cutters
  - The Ingalls yard has the space to expand, and the capacity to surge production

– Consolidate submarine building at EB, or with a new *single* submarine production company
  - Such a move is guided by the fact that moving to a submarine building rate of more than one *Virginia* SSN per year is unlikely, and that the overhead associated with splitting the construction of one submarine between two companies is both inefficient and expensive
    - EB has built SSBNs, SSGNs, and SSNs, and has the capacity to surge submarine production
  - This move would also maintain two national shipyards capable of designing and building nuclear combatants

- It is true that such a consolidation/specialization in three yards—one for carriers, one for large combatants, and one for submarines—would limit the possibility of competition and would increase the risks associated with an infrastructure attack, *in the near term*
  – However, learning curve efficiencies can accrue serious savings, as demonstrated in the *Trident* SSBN program: Electric Boat, producing one *Trident* SSBN per year in a sole source contract, reduced the number of man hours required to build the SSBN by 50% over the 18+ year life of the contract

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Supporting Industrial Base (6)

  - And with regard to the latter, the DoN long ago consolidated the construction of nuclear-powered carriers in a single yard, concluding that the benefits of infrastructure and construction efficiencies outweighed the risks of an infrastructure attack

- However, this near-term consolidation into three specialized yards would not necessarily preclude the possibility of long-term competition in large aviation power projection platforms, surface combatants, and submarines
  - This would depend entirely on whether or not future sea base aviation platforms and the SCX could be built in smaller Tier II yards, and whether or not the or USSX turns out to be a nuclear boat
  - Aviation ships, surface combatants, and submarines that can be built in a variety of different yards might spur increased competition

- Given the current small yearly build numbers, consolidating construction of aircraft carriers, surface combatants, and submarines in three different yards makes sense. However, the same logic does not hold true for auxiliaries and smaller combatants
  - These ships can normally be built at a variety of Tier I and Tier II yards; competition can thus be maintained in a reasonable and cost-effective way
    - For example, competing auxiliaries and sea lift and maneuver sea base ships between NASSCO, Avondale, and Tier II yards may help to keep the costs of these ships down
  - Building multiple classes of a single ship is another prudent way to enforce cost control, since the DoN could threaten to divert production of any ship class that exceeds its cost target to another company/class that does not
    - Simultaneously building both the LM and GD versions of LCS and the Northrop Grumman National Security Cutter, Medium, gives the DoN the option and flexibility of shifting production to whatever ship stays within its cost target

Supporting Industrial Base (6)

- Of course, Congress and the DoN may elect to retain industrial capacity, and to pay an additional naval competition "insurance premium" associated with maintaining excess shipbuilding industrial capacity. For example:
  - Congress and the DoN might wish to retain two submarine yards until the USSX design is clear, and wait to rationalize the submarine building infrastructure until after the potential USSX yearly production rates are better understood
    - The submarine costs in this report's plan are based on split-yard production
  - In a similar vein, Congress and the DoN might wish to retain two surface combatant yards until the design of the SCX is clear, and wait to rationalize the surface combatant building base until after potential SCX yearly production rates are known
    - In this regard, Congress could authorize a modest additional number of DDG-79s to keep both BIW and Ingalls "hot" until the SCX is designed and competed
    - These ships might increase the surface battle line to 86 ships, and/or replace the oldest DDG-51s on a one-for-one basis
      - The production costs for DDG-79s built to replace early DDG-51s would be offset to some degree by the costs that would have been spent on the DDG-51 mid-life modernizations

- However, should Congress elect to maintain excess industrial capacity, they should pay the premium required to do so *by adding additional money to the steady-state TFBN shipbuilding line*

- Note that the previous discussion was informed by the TFBN transition plan developed in this report. *Other plans would generate far different recommendations.* The key point is that:
  - **The US shipbuilding infrastructure must be rationally sized for expected future austere shipbuilding budgets, and to support whatever fiscally prudent TFBN transition plan is finally developed by DoN planners**

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Postscript

- When developing this plan, the vision of a truly integrated DoN Sea-based Power Projection Battle Network emerged, in which surface combatants and sea-based maneuver platforms merge over time, and the entire sea base connector force—built from the start with a high degree of *shared* modularity—becomes a distributed, multi-purpose TFBN warfighting asset
  - This vision suggests, for example, a "LPD-17 like" SCX with a single AGS and two 64-cell VLS modules forward, the capacity to carry a 500-Marine SPMAGTF, and a modular, voluminous "rear end" that can be used either to provide air and surface connector interfaces, or to house additional modular weapons and sensors
    - Such a ship would likely create an integrated TFBN fighting team reminiscent of the closely knit Navy-Marine crews seen in the Frigate Era
  - This vision also suggests that every LCS, JHSV, LCH(X), LCAC(X), X-Craft, or Vari-Craft should be built with common modular stations (different numbers for each vessel, depending on their size) and module interface connections, tot enable them to serve *either* as a sea base connector *or* as a distributed node in a special purpose battle network
    - There is no reason why, for example, an LCAC(X) could not have a single LCS weapons station that would allow it to carry four Netfire launch units, and 180 short-range guided missiles, either for suppression of enemy defenses at a littoral penetration point, or for anti-boat missions
  - This vision also suggests that every ship in the TFBN—be they combatants, command ships, hospital ships, and tenders—should have air and surface connector interfaces that enable them to operate as part of a future "Sea as Base" Power Projection Fleet, capable of operations in defended access scenarios for extended periods of time

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Questions?

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