

Special Report: Wargames, analysis suggest need to rebalance US Navy fleet

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Key points

- Analysis of recent wargames suggests the US Navy may need to decrease its legacy large platforms to sustain a future fleet, even as the service plans to increase its force of large surface combatants
- The new hedge force concept being developed by the navy could help meet operational needs

UPDATED

The US Navy (USN) will have to pare down the number of guided-missile destroyers (DDGs), nuclear-powered aircraft carriers (CVNs), and aviation assets if the service wants to sustain a fleet of the size and scope planned in coming decades, according to wargaming results and analysis of USN forces recently completed by the Hudson Institute.



A recent analysis indicates the US Navy should reduce its force of carriers and air assets, like the aircraft shown here on USS Dwight D Eisenhower. (Janes/Michael Fabey)

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“CVNs, DDGs, and naval aviation require disproportionate levels of O&S [operations and sustainment] funding and personnel,” Hudson Institute Senior Fellow Bryan Clark told *Janes* on 23 July during a briefing about Hudson Institute analysis of wargames the think tank has executed with the US Navy (USN) over the past three years.

The Hudson Institute is slated during the third quarter of 2026 to release a report on its wargame analysis and recommendations.

“A fleet design that reduced the number of these units would be more sustainable from a fiscal, industrial, and talent perspective,” Clark said, adding that the navy is unlikely to have the funding needed to operate, maintain, crew, and support a larger version of today's force.

“Advocates of a larger fleet in the executive and legislative branches are eager to double or triple ship construction spending but show little appetite for commensurate growth in navy operations and maintenance [O&M] or military personnel funding,” Clark said.

The *US Navy Shipbuilding Plan May 2026* may not reflect the true O&S costs of the navy's planned fleet, Clark warned.

USN officials noted they are changing the way they maintain ships to help reduce the amount of time the ships spend in long-term availabilities as well as the costs associated with the repairs and overhauls. Also, the navy is beginning to rely on digital twins and related technology advancements to improve maintenance and bring down costs.

The navy projects the force of crewed combat and support ships growing to nearly 400 vessels by 2055, or 30% more than in 2026, Clark noted. But the plan estimates O&S spending rising at the rate of inflation, with episodic increases to accommodate CVN refuelling and complex overhaul (RCOHs).

“Under the 2027 shipbuilding plan, compared with the 2025 plan, the navy would purchase substantially more large surface combatants,” the Congressional Budget Office (CBO) noted in its report, *The Navy's New Battleship Program: Costs and Implications for the Shipbuilding Industrial Base*, released on 6 August.

The average annual amount of funding needed to buy surface combatants would rise by slightly more than two-thirds, to USD19 billion from about USD11 billion, the CBO observed. “By 2035, the navy's 2027 plan would more than double the tonnage of large surface combatants that shipbuilders would need to produce,” the CBO reported.

“Overall, the tonnage of large surface combatants to be constructed would need to increase by 60%, while the tonnage of small surface combatants would decrease by about 40%,” said the CBO, adding the shipbuilding industry could be challenged to accommodate such a sizable increase in the production of large surface combatants.

“The 2027 plan would more than double the number of destroyers the shipbuilding industry would need to construct,” the CBO reported. “By 2043, shipbuilders would need to produce about 11,000 tons [9,979 tonnes] more per year, on average, under the 2027 plan.”

If the navy built the larger fleet proposed in its shipbuilding plan, future administrations would either need to substantially increase O&M and personnel budgets, or retire ships early to protect procurement spending, Clark predicted.

“This path is unsustainable,” he said. “The navy is unlikely to receive more than USD100 billion a year— more than double today's cost in inflation-adjusted terms — to maintain, crew, and sustain the fleet produced by the FY [fiscal year] 2027 shipbuilding plan.”

“The Pentagon's traditional answer to more challenging adversaries, exemplified by the 1980s ‘600-ship Navy,’ is to grow the fleet and make its ships more capable and survivable,” Clark observed. The Department of Defense is now continuing that strategy, while also attempting to revitalise the US shipbuilding industry to do so, he said.

Navy ship-construction funding grew from about USD16 billion in 2020 to more than USD80 billion in the proposed FY 2027 budget, according to budget documents. Clark estimated, accounting for inflation, the Pentagon has more than tripled shipbuilding investment between FY 2016 and FY 2026.

However, the increase in ship-construction funding has not translated into more ship deliveries, Clark also noted. Shipyard backlog has more than doubled between 2010 and 2026, even after accounting for inflation. Deliveries also increased during that period, before dropping during the Covid-19 pandemic.

“Instead of attempting to recapture the lost industrial base of a bygone era, the US government needs to right the ship by building a fleet that is designed to compete rather than dominate,” Clark suggested. There exists a window of opportunity now during which private companies are accelerating production, defence spending is increasing, and lessons from Ukraine to Iran are freshly being analysed, he said.

“The navy cannot grow the fleet in its current form due to industrial and fiscal constraints,” Clark said. To meet increasing demands with a shrinking force the navy has been extending deployments, basing more ships overseas, and cutting training time for less-likely operations, he observed.

“These workarounds are unsustainable for a multi-mission general-purpose fleet, but they point to a potential way for the navy to meet future needs by forward deploying specialised forces that are tailored to address the most challenging regional scenarios,” he said.

USN officials have told Hudson Institute they are considering retiring more ships early – before their planned lifecycles are finished – to build ships more quickly, replace ships earlier, and create a younger fleet through a healthier industrial base supported by more shipbuilding funding. “That's fine,” Clark said. “But the navy shouldn't say then it is growing the fleet. That won't grow the fleet.”

Hedge force

What the wargaming indicates – and what the Hudson Institute continues to recommend – is a “hedge force” concept to address global challenges like: anti-submarine warfare (ASW) against large numbers of quiet submarines in the North Atlantic or Western Pacific, clearing mines in the Persian Gulf, or defending Taiwan from invasion and blockade, Clark said.

“To support these tailored forces, the force design includes more than 1,500 robotic and autonomous systems (RAS) in a pool the navy can integrate with appropriate payloads and distribute to operational commanders,” he said.

Admiral Daryl Caudle, the chief of naval operations (CNO), has been advocating for such a hedge-force concept for more than a year, citing it in his fighting instructions released in February.

The combined costs of the new force design's general-purpose force and hedge forces should remain below that of the navy's recent shipbuilding plans and are within the capacity of the current defence industrial base, Clark observed.

“The general-purpose force incorporates the same basic elements as today's fleet but rebalances the mix to require fewer personnel and incur lower O&S costs,” Clark said. “It includes fewer aircraft carriers and surface combatants than in navy plans, more logistics and support vessels, and replaces the navy's proposed Trump-class BBGN (guided-missile battleship) with a guided-missile cruiser (CG).”

According to the CBO, the leading driver for the large surface-combatant surge is the plan to design, build, and buy the proposed fleet of nuclear-powered battleships.

The initial USN lead-ship cost for battleship after plans were announced late last year was about USD15.1 billion, with the average cost of the second and third ships estimated to be about USD10.2 billion.

“Those estimates were for a conventionally powered ship,” the CBO noted, adding that in the shipbuilding plan released in May, the 15 battleships planned for purchase between 2028 and 2056 would be nuclear-powered.

That plan called for construction of one ship in 2028, one in 2030, one in 2031, and then one every other year through 2056, the CBO observed. “The total cost of the Navy's new nuclear-powered battleship programme would be about USD275 billion (in 2026 dollars) over the 2027–2056 period,” the CBO reported. Incorporating the nuclear proposal increased programmatic costs by about 13%, the CBO said.

“The first ship would cost about USD23 billion,” the CBO estimated. “For the 15 ships that would be purchased through 2056, the cost would average slightly more than USD18 billion per ship.”

“The navy could buy five destroyers for the price of one battleship,” the CBO noted, adding, “However, over an expected service life of 40 years, those five destroyers would cost far more to operate than one nuclear-powered battleship because they would require more sailors and overall maintenance and would consume fossil fuel.”

CBO estimates that future Ford-class aircraft carriers under the Navy's 2027 shipbuilding plan would cost about USD22 billion each.

The CBO emphasised, “Those [battleship cost] estimates are highly uncertain and rely on CBO's assessments of the ship's design and the overall battleship programme. Other factors could also make costs higher or lower than CBO's estimates.”

Still, the CBO noted, “Lead ships are notoriously difficult to build and almost always experience substantial cost growth.”

CBO estimates also include a 12% increase to account for current difficulties in the shipbuilding industrial base that did not exist when the lead ships of the guided-missile Ticonderoga-class cruisers (CG 47), Arleigh Burke-class destroyers (DDG 51) and Zumwalt-class destroyers (DDG 1000) were built, the report said.

“In recent years, the number of labor hours required to build DDG 51 destroyers has increased substantially for ships,” the CBO noted. “In CBO's view, that phenomenon reflects ongoing labor force challenges among the shipyards building the navy's large surface combatants.”

The CBO also reported that ships under construction now have been taking longer to build than the navy anticipated when the funding for that construction was appropriated. “Attack submarines, destroyers, and large amphibious ships now require nine to 11 years to build, up from five to six years during the first decade of the 2000s,” the CBO said.

Given the history of next-generation destroyer DDG(X) programmatic issues and the ongoing delays in producing ships, a clean-sheet design of a much larger ship is unlikely to be ready in time for battleship production to begin in 2028, the CBO warned. “A ship as large as the BBGN would require significantly more work to design and more detailed digital models than the DDG(X) would have needed,” the CBO reported.

To address concerns about the relatively short timeline for developing the BBGN's design, the navy plans to incorporate “modern digital engineering, advanced production practices, and [artificial intelligence]-enabled design tools to reduce cost and schedule risk from the outset,” the service noted in its May shipbuilding plan.

The initial design concept for the battleship calls for a displacement of about 31,751.5 tonnes, a length of 256 m to 268.2 m, and sustained speed greater than 30 kt. That is more than three and a half times the size of a DDG 51, more than twice the size of DDG 1000 – larger than any USN surface combatant since World War II, the CBO noted.

Concentrated firepower

“The battleship's main battery would include missile cells for anti-ship, anti-air, and land-attack missiles and, presumably, the ship's nuclear cruise missiles; it would also include launchers for hypersonic Conventional Prompt Strike (CPS) missiles,” CBO noted.

“Other elements would include large lasers, a rail gun, and a variety of defensive systems such as guns, smaller missiles, decoys, and optical dazzlers intended to counter and disrupt unmanned aerial systems,” the CBO said.

The ship would likely carry the nuclear-armed sea-launched cruise missile (SLCM-N), the CBO reported, adding, “The number of nuclear-tipped cruise missiles the ship would carry is unknown but would probably be small given the navy's descriptions of the nuclear cruise missile programme. Nevertheless, carrying nuclear weapons would give the battleship more firepower than any ship in the fleet other than the navy's 14 Ohio-class ballistic missile submarines (SSBNs).”

CBO added, “The ballistic missile submarines that will replace those ships — the Columbia class — are currently being built and are expected to cost about USD10 billion each.”

The battleship is expected to carry 128 Mark 41 vertical launching system (VLS) cells in addition to four CPS missile tubes, each of which would contain three missiles, for a total of 12, the CBO observed, adding, “Only the navy's four guided missile submarines, which carry as many as 154 land-attack missiles, have a comparable missile complement.”

While the DDG(X) was intended to have some of the same capabilities as the BBGN, the proposed destroyer would have displaced half the tonnage of the battleship. “The navy has stated that the much larger battleship would avoid ‘undesirable capability and weapon system compromises’ that would have been required by the DDG(X)’s design,” the CBO noted.

Instead of pursuing the DDG(X) programme, the navy will continue to produce DDG 51 destroyers for longer than projected in its previous 30-year plan, the CBO said.

However, the CBO cautioned, “The fact that the BBGN would be the most heavily armed surface combatant the Navy has ever built could also increase costs. It would carry a large complement of missiles, lasers, and a rail gun in addition to the Navy's most advanced and capable radars, sensors, and combat systems. Integrating that many advanced systems on one warship could prove challenging and raise costs, as occurred with the DDG 1000.”

On the other hand, the CBO also noted, “Switching to nuclear power would reduce the battleship's operating costs over time by eliminating the need to purchase fuel.”

The cruiser proposed by Hudson Institute would displace about 20,000 tonnes— meaning it would need fewer people to operate it than the battleship, Clark said. The smaller ship would cost less to build and sustain the ship, he projected.

Also, unlike the battleship, the cruiser would not be nuclear powered, cutting down on the number of extra watchstanders required for a nuclear-powered vessel, he said.

While current USN surface warfare leaders support the nuclear-powered concept for battleships, previous analysis has shown nuclear-powered surface combatants would be too expensive to build and operate, Clark noted.

The plan now is to build the battleships at HII Newport News Shipbuilding's yard in Virginia, which builds carriers and submarines. Construction in that shipyard, though, could delay those programmes, Clark said.

“Newport News Shipbuilding is behind schedule on constructing three aircraft carriers, as well as many submarines,” CBO reported. “Adding the final assembly of a nuclear-powered battleship to the shipyard's workload could lengthen the delays for those programs, in addition to delaying the construction of the battleship itself,” CBO reported.

USN officials who oversee nuclear shipbuilding programmes acknowledged that possible battleship-construction impacts on their programmes warrant watching, but they noted that battleship construction plans, including the timeframe, remain uncertain.

“In support of the navy's fleet, HII is supporting the design, engineering and analysis of the BBGN battleship,” HII Corporate Public Affairs Director Danny Hernandez told Janes on 19 August.

The proposed cruiser would be able to carry hypersonic and directed energy weapons but would have fewer vertical launch systems, he said. The cruiser also lacks the railgun proposed for the battleship.

The Hudson Institute recommends the USN maintain a fleet of nine aircraft carriers based on a minimum need for two CSGs deployed and underway to provide options for crisis response and to reinforce hedge forces in deterring aggression, Clark said. The navy's current construct includes up to seven large surface combatants per CSG to protect the carrier from air, missile, and submarine threats, he noted.

He added that this would create a demand for up to 63 DDGs or CGs to accommodate the CSG operations.

For more, please see: [Special report: Nimitz aircraft launches and recoveries depend on maintainers](#)

Comment

Surface warfare officers familiar with combat operations told *Janes* they believe a railgun may be unnecessary on a next-generation large surface combatant. However, they said they support the battleship concept now because the Trump-class designation has attracted administration funding and support they were unable to secure in previous years for large-surface combatant programmes.