

CVN 21 Next Generation Aircraft Carrier

The Navy accelerated the new Aircraft Carrier program since the last report. The original vision was a three-step evolutionary program advancing from CVN-77, the last of the NIMITZ class, through CVNX1 and culminating in a new aircraft carrier design in CVNX2. In response to the FY04 Defense Planning Guidance, the Navy proposed changes that were approved in a December 12, 2002, Program Decision Memorandum. The restructured program was renamed CVN 21 and will retain the baseline NIMITZ class hull form. CVN 21 will have a smaller island located farther back on the flight deck, three (rather than four) aircraft elevators, two (rather than three) hanger bays, electromagnetic (rather than steam) catapults, and redesigned weapons stowage and weapons elevators. The Navy believes these changes, combined with a slightly larger flight deck, unobstructed catapult configuration, and a pit-stop aircraft servicing and rearming arrangement, will yield the desired/anticipated increase in sortie generation rate.

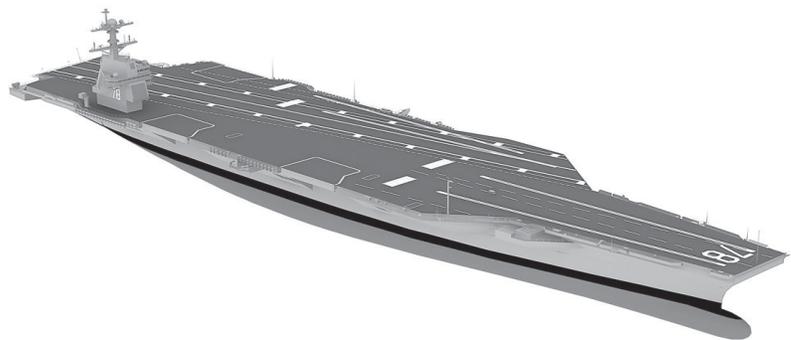
The ship will incorporate a new propulsion plant hoped to be less manpower intensive and have significantly more electric generating capacity than the present NIMITZ class plant. Hull materials and internal design features emphasize enhanced survivability. Additionally, the Navy proposed that CVN 21 be developed in two phases. Phase I will include all the features described above. Phase II will include the ship's Integrated Warfare System (IWS) (e.g., the mission planning, command, control, communications, computers, intelligence, surveillance, and reconnaissance), air traffic control, and ship's self defense systems and aviation intermediate maintenance facilities that are heavily dependent upon evolving commercial technology. The Navy intends this phased approach to provide more robust technology insertions while minimizing disruptive changes during ship construction.

TEST & EVALUATION ACTIVITY

DOT&E and Operational Test and Evaluation Force (OPTEVFOR) witnessed competing contractors' full scale, half-length, testing of Electromagnetic Aircraft Launching Systems (EMALS) at Naval Air Warfare Center, Lakehurst, New Jersey. A down select is scheduled for January 2004. Representatives from DOT&E and OPTEVFOR are witnessing early testing of the Multi-Function Radar Engineering Development Model (EDM) at Wallops Island, Virginia. The early operational assessment, approved by DOT&E in September 2002, was delayed due to program restructuring and is now projected to be complete after the EMALS down select in 2QFY04. The Navy is planning a Test and Evaluation Master Plan (TEMP) to support a 3QFY04 Milestone B decision.

On July 1, 2003, the Future Carrier Program Office completed and approved the first Carrier Vulnerability Assessment Report (VAR). This report details an engineering analysis and assessment based on test and evaluation efforts, including surrogate live fire tests, for the preliminary CVNX ship design. The approval of the CVNX VAR concluded 3 1/2 years of effort involving over 10 organizations and dozens of subject matter experts covering such areas as threats, ship structure, damage control, and fire fighting.

DOT&E and the Navy continue planning activities in support of a robust LFT&E program. During the past year, the Navy performed sixteen shots in a test series for protection system performance against a specific (classified) airborne threat weapon, and conducted one surrogate test of a scaled CVN test article in a simulated underwater explosion. Three test series were conducted on ex-*Shadwell*, the Navy's fire safety research and test facility, examining the fire threat to ordnance stowed in aircraft carrier magazines. The Office of the Director of Naval Nuclear Propulsion has cradle-to-



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NAVY PROGRAMS

grave responsibility for all aspects of nuclear propulsion plants, and DOT&E does not evaluate the nuclear propulsion plant part of these ships.

TEST & EVALUATION ASSESSMENT

The technical risk for this program is moderate. The Navy is conducting a comprehensive early operational assessment in FY04 intended to identify additional risk factors in ten major areas of the ship. By using the proven *Nimitz* hull form the Navy reduced technical risk in Phase I of the ships development. The Navy plans to use Multi-Function Radar and Volume Search Radar for CVN-21 and these are being developed as part of the new DD(X) destroyer program. The greatest risk will probably be in the IWS, most of which is in Phase II of the CVN 21 program. Safe and adequate operational testing of the IWS providing self-defense against anti-ship cruise missiles will require testing with a self-defense test ship.

The program has a competitive test and evaluation program set up for EMALS. A successful EMALS program should significantly reduce the complexity, space, and manpower consumed by legacy steam and hydraulic systems. It could also help increase the life expectancy of carrier aircraft due to a much smoother launch sequence.

The LFT&E program, as planned by the Navy and DOT&E, will be a comprehensive evaluation based on CVN survivability studies, battle damage lessons learned, flight deck accident lessons learned, relevant weapons effects tests, probability of kill versus probability of hit studies, damage scenario-based engineering analyses of specific hits, vulnerability assessment reports, a total ship survivability trial, a ship shock trial, and extensive surrogate testing.