NAVSEA Commander: Evolutionary Approach to Ship Design More Successful

Revolutionary ship designs, such as for the USS Zumwalt (DDG 1000), shown passing under the Chesapeake Bay Bridge in 2016, have sometimes gotten the Navy into trouble, says Vice Adm. William Galinis. The Navy has found a more evolutionary approach is more likely to succeed. U.S. Navy / Liz Wolter

ARLINGTON, Va. – The Navy's experience with fielding new warships in the last two decades has shown that an evolutionary approach to ship design is more likely to succeed than a revolutionary approach, the commander of Naval Sea Systems Command design said.

"As we go forward and look at future platforms, [consider an] evolutionary approach versus a revolutionary approach," said Vice Adm. William Galinis, speaking Dec. 3 in a Defense Forum 2020 webinar sponsored by the U.S. Naval Institute. "Where we have done that [evolutionary approach], frankly we've been pretty successful."

Galinis pointed to the evolution from the Spruance-class destroyer to the Ticonderoga-class guided-missile cruiser to the Arleigh Burke-class guided-missile destroyer (DDG 51) as an example of evolutionary design success.

"The design margin, the robustness of the DDG 51 design continues to prove [itself] even today even as the first three Flight III ships [are] under construction, which right now are state-of-the-art capability going to the fleet," he said.

"Where we've taken that more revolutionary approach, we have in fact struggled," he said. "With DDG 1000 [USS Zumwalt], just the number of new elements of that design that came into

play – everything from the hull form to the propulsion plant to the deckhouse to the sensor suite to the network–as we did that, quite frankly, the mission requirements changed for that platform and we're coming through that. In the end, the Navy and the country are going to get a good ship but it's going to come at a cost."

Galinis said that taking the evolutionary approach instead of a revolutionary approach is a key element to bring on a good, reliable platform once you get through the design and construction phase.

Because of the capital-intensive character of ship design and construction, prototyping is difficult, but Galinis said the Navy is doing more prototyping of ship to reduce risk. He pointed to the land-based prototypes of the Columbia-class ballistic-missile submarine's power plant and drive train and of the SPY-6 Air and Missile Defense Radar on the DDG Flight III with the ship's electrical system. Prototyping also is proceeding with the Navy's unmanned surface and underwater vehicles.