

THE VALUE OF PERFORMANCE.

NORTHROP GRUMMAN

Underwater Launch Systems

Challenging the Submarine Force Payload Paradigm

The Integrated Undersea Future Strategy outlines the increasing demand for undersea capability at a time of declining submarine force structure and accompanying strike capacity. There are two ways to increase that capability: Build more submarines, or make the ones we have more capable. Today's budget constraints make the first path unlikely. The U.S. Navy's payload approach to other platforms, however, offers a path to making submarines more capable.

Today's tactical aircraft carry an interchangeable assortment of weapons, sensors and other payloads. Surface ships launch a variety of anti-air, anti-ship, anti-sub, and land-attack missiles. Our most modern SSNs and SSGNs, in contrast, carry only torpedoes and cruise missiles.

Putting a wider variety of payloads on submarines will make them more flexible, survivable, and effective. Adapting program-of-record payloads to achieve greater cross-community commonality will provide the Navy greater operational value than is possible today.

Northrop Grumman - Facilitating the Paradigm Shift

Northrop Grumman Marine Systems is the Navy's premier provider of submarine launch systems. Every vertical launch system on U.S. Navy submarines today can trace its origin to our Underwater Launch Center of Excellence in Sunnyvale, California.

Our expertise comes from more than 50 years of designing, testing, and manufacturing underwater launch systems. We understand the unique challenges of deploying payloads in an environment in which they were not intended to operate.

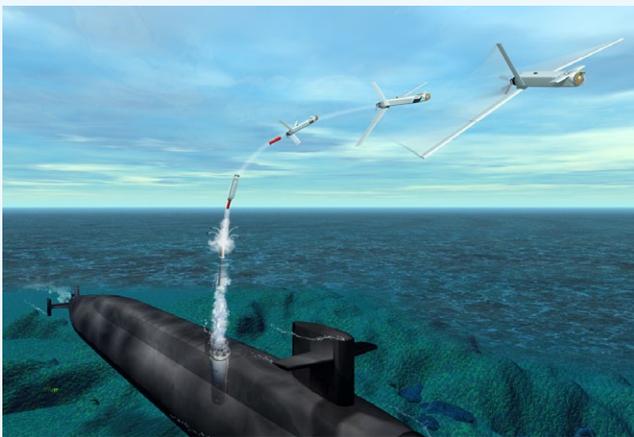
Our approach for introducing new payloads is based on our success developing legacy SSGN and Virginia-class SSN technology. Reconfiguring the Multiple All Up Round Canister (MAC) allows for payloads of sizes other than 21 inch, diverse payload options among separate canisters, and mixed loads within an individual MAC. A non-cylindrical launch cell capability also facilitates weapons that are not round, and concepts to utilize the Virginia

Submarine-Launched Defense System



We adapted and designed the system used to launch Tomahawk cruise missiles, to help Raytheon Missile Systems successfully launch an AIM-9X air-to-air missile from underwater.

Submarine-Launched UAV



We developed, in partnership with Boeing, a capsule-based UAV launch system to address submarine force desire for ISR enhancement.



Reconfigurable MACs will open the submarine market to many more payload providers.

bow tube MAC Center Cell enable even greater versatility and expand payload volume efficiently.

Northrop Grumman's eject launch technology has powered over 7,000 successful launches. It can be scaled to match any payload size and function. We use our proven encapsulation systems to "marinize" weapons not originally intended for undersea launch, helping to challenge past perceptions of dedicated air, surface, and sub-surface weapons.

What We Offer

Marine Systems has the experience to take your payload plans from concept to reality in a reliable and cost-effective manner. Specifically, we offer:

- Eject launch and encapsulation technology
- World-class launcher design team
- Broad network of dedicated teammates
- Advanced systems analysis
- Proven underwater launch modeling and simulation tools
- Specialized manufacturing and test facilities
- Thorough understanding of submarine CONOPS

Take the first step into the undersea domain by contacting us for a first-order feasibility assessment of your payload development plans.

For more information, please contact:

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DS-500-BLB-1013
A330: 13-1708
2013 SV Graphics

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