

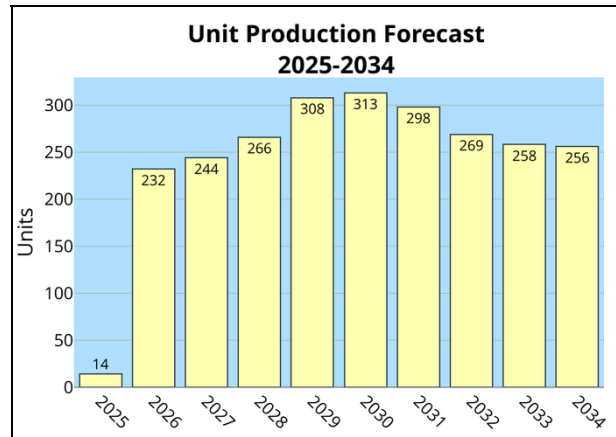
ARCHIVED REPORT

For data and forecasts on current programs please visit
www.forecastinternational.com or call +1 203.426.0800

NSFS

Outlook

- U.S. Navy wants more firepower on surface combatants
- Some warships are equipped with the HELLFIRE
- NSM has been purchased by the U.S. Navy
- Other projects are MACE, ERAM, and LRAM



Orientation

Description. Supersonic land attack missile for Naval Surface Fire Support (NSFS).

Sponsor. The U.S. Department of Defense through the U.S. Navy Naval Surface Warfare Center, Surface Warfare Division (N86), Washington, DC, USA.

Status. The U.S. terminated the Land Attack Standard Missile (LASM) program in 2002. Work is proceeding on the Affordable Weapon System (AWS). The U.S. is examining the development of a loitering missile system.

The U.S. Marines are looking at the Long-Range Attack Missile (LRAM), while the Navy is considering the Multi-mission Affordable Capacity Effector (MACE). The U.S. Air Force has a similar project known as the Extended Range Attack Munition (ERAM).

Total Produced. Some missiles to meet naval needs are in production, but the development of an all new weapon is not complete. The U.S. Navy once needed between 700 and 1,500 missiles to meet its fire support requirement. Now, the Pentagon is looking for a lower cost missile than it can purchase in greater numbers.

The LASM never entered production.

Application. To provide surface warships with the ability to engage land targets at a range of up to 260 kilometers, depending on the warhead.

Price Range. The estimated unit price of the LASM was \$300,000. The MACE and ERAM might have a price around \$300,000 apiece. The U.S. Navy wants to keep the cost of the LRAM down, probably below \$500,000 per unit. No official price of the LRAM is available.

NSFS**Contractors****Prime**

Boeing Defense, Space & Security	https://www.boeing.com/defense , PO Box 516, St Louis, MO 63166 United States, Tel: + 1 (314) 232-0232, Fax: + 1 (314) 777-1096, RDT+E, (Research)
Lockheed Martin Missiles & Fire Control, Division HQ	https://www.lockheedmartin.com , 1902 West Frwy, Grand Prairie, TX 75051 United States, Tel: + 1 (972) 603-1000, Fax: + 1 (972) 603-1009, RDT+E, (System Research)
Raytheon	https://www.rtx.com/raytheon , 1151 E Hermans Rd, Tucson, AZ 85706 United States, Tel: + 1 (520) 794-3000, RDT+E, (Research)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

	<u>Metric</u> LASM	<u>U.S.</u> LASM
Dimensions		
Length	472.44 cm	186 in
Diameter	34.29 cm	13.5 in
Weight (estimated)	625 kg	1,375 lb
Performance		
Speed	Supersonic	Supersonic
Range (max)	286 km	177.61 mi

Propulsion. Older SM-2s are equipped with the Mk 56 dual-thrust, solid-propellant rocket motor manufactured by GenCorp's Aerojet Propulsion Division and/or Alliant TechSystems (formerly Hercules Inc). The RIM-66G through RIM-66M medium-range missiles use the Mk 104 dual-thrust solid rocket motor, which is procured on a competitive basis from Thiokol Propulsion (a division of Cordant Technologies), Atlantic Research Corp, and Aerojet.

Control & Guidance. The LASM was to be equipped with a GPS receiver and inertial navigation system to guide it to a predetermined target. Additionally, the GPS/INS guidance system was to incorporate significant anti-jam features that would enable the LASM to attack targets with precision in a heavy electronic countermeasures environment.

Launcher Mode. This missile was to arm the DD-21 destroyer and surface combatants equipped with the Mk 45 gun. The LASM would have provided AEGIS surface warships with a surface fire support weapon that had the range, lethality, responsiveness, and accuracy required to support U.S. Army and Marine Corps forces ashore.

The missile was to be fired from the Mk 41 vertical launch system (VLS).

Warhead. Initially, the Land Attack Standard Missile was to be fitted with a modified Mk 125 blast-fragmentation warhead. This warhead was to be optimized for the LASM's terminal trajectory to enhance effectiveness in the land attack role. The Mk 125 modifications primarily involved alterations to the warhead's explosive initiation system to compensate for the missile's downward velocity. The U.S. Naval Surface Warfare Center in Dahlgren, Virginia, was responsible for the warhead's design and verification.

The blast fragmentation warhead could have eventually been replaced, but its replacement had yet to be determined when the program was terminated. Options included a penetrator and the Sense and Destroy Armor (SADARM) submunition. The composite payload section was to be developed by Alliant TechSystems and the U.S. Naval Surface Warfare Center under a cooperative research and development agreement.

Variants/Upgrades

Only a single version of the LASM – the SM-4 – was in development, but upgrades could have been made available later. Raytheon outlined a long-term LASM growth path that offered a number of options to extend range, incorporate new warheads (such as SADARM, the BLU-108, or the SMART 155 submunition), and expand the missile's tactical flexibility. The LASM could have been equipped with an in-flight communications link to allow for in-flight retargeting.

A booster could have been added to the LASM to extend its range beyond 200 nautical miles. Another

proposal called for using a version of the Mk 104 rocket motor. This would have increased the LASM's payload capacity to 750 pounds and its range to more than 300 nautical miles.

This growth path could have allowed Raytheon to meet the U.S. Navy's Advanced Land Attack Missile (ALAM) requirements. A further development of the LASM, tentatively known as the SM-5, could have met this need and provided surface warships with a cruise missile interceptor.

Program Review

Background. With the retirement of its last battleship, the U.S. Navy lost the final vestiges of a once formidable long-range fire support capability. The service was reduced to depending on 5-inch/54-caliber guns, with a maximum effective range of 13 nautical miles, to provide it with a more limited naval surface fire support capability.

Since the 1960s, the U.S. Navy has investigated numerous ways to replace this capability, but few provide long-term solutions. In 1991, the Center for Naval Analysis was tasked with conducting a cost and operational effectiveness analysis (COEA) that examined a variety of gun and missile weapons system combinations as candidates to meet NSFS requirements. This analysis also assessed requirements for fire support in two major regional conflicts using a threat-driven target set where the majority of the targets were within 75 nautical miles of the coast.

Missile to Offer Replacement for Lost Battleship Firepower

The COEA results indicated a 155mm gun employing precision-guided munitions was the most cost-effective solution for providing NSFS. However, lack of a suitable platform and budgetary constraints necessitated a focus on long-range 5-inch gun technology and precision-guided munitions.

In 1996, to properly address the issue of naval forces in support of ground troops, the Surface Warfare Division of the Office of Naval Operations was reorganized. This reorganization included the formation of the Land Attack Warfare branch (N864), whose major responsibility is to meet evolving requirements for the conduct of surface land attack warfare in the littoral environment and to strike land targets inland. Based on the findings of NSFS studies, N864 formulated a weapons development plan focusing on near-term,

midterm, and long-term solutions to NSFS deficiencies, as follows:

- *Near-term (2001)* – The near-term core program focused on improving the 5-inch/54-caliber Mk 45 guns and developing an extended-range guided munition (ERGM).
- *Midterm (2006)* – Midterm program initiatives included developing and fielding a supersonic land attack strike missile to neutralize soft stationary targets and provide interdiction fire for the U.S. Marine Corps by FY02. A quick-strike land attack missile is being developed to fill a tactical need in terms of response time for interdiction fire in the 64- to 200-nautical-mile engagement area.
- *Long-term (2012)* – Long-term requirements called for the development of a larger-caliber gun to fire future technology ERGMs.

To meet its missile requirement, the U.S. Navy needed a system that fell within its cost constraints but provided the necessary lethality and range requirements. Two systems were evaluated to meet this need: a navalized Army Tactical Missile System (ATACMS) capable of being vertically launched, and the Raytheon Land Attack Standard Missile (LASM). The navalized ATACMS, also called NTACMS, was to be capable of being launched from surface ships and submarines.

Eventually, the U.S. Navy selected the LASM as the winner of this competition. Navy studies showed that the proven Standard missile system was the most reliable and cost-effective way to immediately strengthen the Fleet's ability to attack inland. Still, the service said this decision did not completely close the door on the navalized ATACMS, which could be procured later to meet a future NSFS requirement.

NSFS

Re-evaluating Options. In early 2002, the U.S. Navy again changed course and decided against procurement of the LASM. With this program's cancellation, the Navy began to re-evaluate the options for meeting its fire support need. Multiple systems could be procured to meet this requirement (see New ALAM entry).

By 2008, the U.S. Navy had awarded a new study contract to Boeing for an Affordable Weapon System. This is to be a sea-based weapon capable of performing land-attack and strike missions. The weapon will operate from Navy surface warships and possibly Navy and Marine combat aircraft.

The U.S. Navy once foresaw the DDG-1000 destroyers using its Advanced Gun System (AGS) to support Marines during shore operations. By 2017, the U.S. Navy began to rethink this plan.

The U.S. Navy announced in 2021 that it planned to remove the AGS from its DDG-1000s to make room for a new vertical launch system. This VLS will fire Conventional Prompt Strike (CPS) missiles, which are hypersonic weapons.

This modification will turn the DDG-1000s into a strike platform.

That same year, the U.S. Congress asked the Pentagon of the possible use of ground-based missiles onboard naval surface combatants, including new hypersonic systems. The Navy could place the Advanced Payload Module (APM) on its warships.

USMC LRAM. The U.S. Marine Corps is looking for a new long-range attack missile (LRAM) to arm its fleet of vertical-take-off-and-landing (VTOL) platforms, such as its AH-1Z Viper attack helicopters. The LRAM is a stand-off weapon that can engage maritime and land-based targets.

The LRAM is to be a loitering, swarming munition capable of carrying a payload weighing a minimum of 25 pounds and offering a range of 150 nautical miles. The U.S. is to acquire this weapon at a low cost.

Another name for this project is Long-Range Attack Munition. The LRAM is a replacement for the HELLFIRE missile currently in service on Marine Corps helicopters. This munition will be capable of launch from ground-based platforms.

The LRAM will build on the L3Harris Red Wolf air-launched unmanned air vehicle (UAV).

The Pentagon released a video on July 13, 2021, showing a new "long-range effect" cruise missile, which is part of a family of Air Launch Effect (ALE) munitions.

Tests of the LRAM reportedly had begun by early 2024.

The U.S. plans to issue a design contract to a specific company in 2025. The first units are to achieve an early operational capability in 2027 with an initial operational capability scheduled for 2028.

MACE and ERAM. The U.S. Navy plans to allocate funding for work on the Multi-mission Affordable Capacity Effector program. This is to be a low-cost, air-launched standoff weapon and is not related to LRAM (see separate entry).

A Request for Information was issued by the Naval Air Systems Command for the MACE weapon system in March 2024. The Navy wants to rapidly develop and field prototype units.

Money for MACE could be part of the FY26 budget request. The MACE could complement the U.S. Navy's Long-Range Anti-Ship Missile (LRASM). The MACE will have a subsonic speed and offer a range of 370 kilometers. The warhead is to weigh 34 kilograms.

The U.S. Navy is looking to keep the MACE's price under \$300,000 apiece. Minimum annual procurement could be 500 rounds. The F/A-18E/F Super Hornet and F-35 Joint Strike Fighter are to carry the MACE.

There is a chance that the MACE is based on the Stand-in Attack Weapon program (see separate entry under the AGM-88 HARM report).

The U.S. Air Force mentioned in January 2024 the Extended Range Attack Munition program, which is another effort to investigate low-cost cruise missiles. There is no specific funding line for the ERAM in the U.S. FY25 defense budget request.

The ERAM could weigh 227 kilograms and travel at least 400 kilometers. This missile will have a subsonic top speed.

Missile Models. Only one version of the LASM was in development. Various concepts are being studied to meet U.S. Navy land attack and strike mission requirements.

SM-4 LASM. In order to meet its NSFS requirements, the U.S. Navy required a supersonic land attack missile. After extensive analysis and review, the Chief of Naval Operations selected the LASM for development and procurement. The missile was a modification of the Navy's long-standing SM-2 surface-to-air missile.

The Navy needed a quick-strike land attack missile with a 185- to 260-kilometer engagement area. Studies determined that the LASM was the most cost-effective way to provide a rapid response and all-weather strike capability in support of military power projection ashore.

The first successful LASM concept demonstration flight occurred on November 21, 1997, at the White Sands Missile Range in New Mexico. Concept testing continued through 1998. In September 1998, the U.S. Navy successfully conducted the third in the series of LASM concept demonstration flights at the White Sands Missile Range. The objective of this particular test was to build upon a July 24, 1998, static firing of the Mk 125 warhead conducted at the Naval Surface Warfare Center, Dahlgren Division, Virginia, in order to validate the warhead fragment pattern under actual missile flight conditions. The LASM met all program objectives during this test.

An engineering and manufacturing development (EMD) contract was awarded to Raytheon in 2000. Low-rate initial production (LRIP) was to begin in 2002, with the LASM entering U.S. Navy service by late 2003 or early 2004. An estimated 1,200 SM-2 missiles were available in U.S. Navy stocks for immediate retrofit to land attack weapons, although it is possible that only 800 SM-2s were converted to LASM status. However, as mentioned previously, in early 2002, the Navy decided to terminate the LASM program as well as its proposed follow-on – the Advanced Land Attack Missile.

The designation associated with the SM-4 was RGM-156A.

SM-6 Anti-Ship. Raytheon has developed a version of the SM-6 capable of engaging naval surface targets (the Block IA). An example of the SM-6 was successfully modified to perform this mission. Tests took place in secret on January 18, 2016. The DDG-53 USS *John Paul Jones* destroyer fired the modified missile, which hit the decommissioned FFG-57 USS *Reuben James*.

This version uses targeting data from an E-2D Hawkeye surveillance aircraft and its onboard seeker for its terminal phase. This missile could help to boost the U.S. Navy's surface-launched anti-ship capability.

During its 2022 Valiant Shield exercise, the SM-6 was used to strike the decommissioned USS *Vandegrift* (FFG-48) frigate. The missile was fired from the USS *Benfold* (DDG-65), an Arleigh Burke class destroyer, on June 17.

ALAM. The Advanced Land Attack Missile was to be a follow-on to the LASM that would meet the U.S. Navy's long-term NSFS needs. The missile would have armed the service's surface combatants – especially the DD-21 destroyers – and submarines. The ALAM's development schedule was to be consistent with the deployment of the lead ship of the DD-21 class.

Subsonic, supersonic, hypersonic, and boost-glide munitions were all being considered for meeting the ALAM need, but the U.S. Navy Analysis of

Alternatives (AoA) recommended the boost-glide option as the best path to pursue. Options to meet the ALAM need included a Lockheed Martin offer to navalize its ATACMS, a modified Tactical Tomahawk, and a further-improved LASM.

The Navy said it did not have sufficient funding to develop an all-new missile, and it reportedly favored a further-improved LASM to meet the ALAM requirement. The U.S. Congress wanted to see an open competition launched, involving entries from Raytheon (Improved LASM) and Lockheed Martin (Naval ATACMS).

Previously, the Navy had wanted to commence EMD of this follow-on missile in FY04, with LRIP beginning in FY07. The missile was to enter service by FY10.

In early 2002, the U.S. Navy announced that work on the ALAM had been halted after the termination of LASM. Soon after this action, the Navy began considering alternative options. (Boeing won a contract to study an Affordable Weapon System in 2008.)

New ALAM. The U.S. Navy was seen as restructuring ALAM under a new designation. One source said this effort was known as the Future Land Attack Missile (FLAM) or the Standoff High-speed Option for Counterproliferation (SHOC). This missile may have filled the U.S. Marine Corps' fire support gap between the ERGM and the Tomahawk cruise missile.

Inexpensive Missile to Fill Capability Gap

Options to meet this need included a low-speed missile with a loitering capability, a high-speed missile, and a supersonic cruise missile. The U.S. Navy was already working on the Joint Supersonic Cruise Missile (JSCM) with Orbital Sciences (later Orbital ATK and now Northrop Grumman Innovation Systems) and Lockheed Martin (the latter was working on a solid-fuel ramjet). The JSCM was seen as a successor to the AGM-84H SLAM-ER, but it could be used to meet any new ALAM requirement. Some sources said a supersonic cruise missile would not be available soon enough to meet this need.

Lockheed Martin was again offering its navalized ATACMS to meet the U.S. Navy's fire support need. This missile was known as the Naval Land Attack Missile (NLAM). Meanwhile, Boeing was developing concepts that could meet this need, including one based on its MA-31 supersonic aerial target. As of 2005, no firm decision had been made on the development of an NSFS missile, and this program may have been abandoned.

NSFS

There are also references to the aforementioned Future Land Attack Missile concept, which includes subsonic and supersonic weapons.

In May 2002, Titan won a \$25.6 million contract to continue development of the Affordable Weapon System from the U.S. Navy's Office of Naval Research. (See Affordable Weapon System entry, below.)

Affordable Weapon System. The U.S. Navy has been looking for a less expensive weapon that could assume some of the missions currently assigned to cruise missiles. Titan, in cooperation with the Office of Naval Research, was working on the AWS concept, which called for the development of a cruise-like missile that used off-the-shelf components to keep the unit price

low. The cost of the AWS was about one-tenth the cost of a traditional cruise missile.

Originally, the target price for the AWS was \$30,000 apiece, but this slowly rose to \$55,000. A complete system consisted of missile, launcher, and mobile ground station.

The AWS Block I version was launched from various platforms via a small rocket booster. During its cruise phase, the AWS used a small SWB-65 turbojet engine. The Affordable Weapon System carried a 200-pound payload to a target several hundred miles away. This missile was equipped with both line-of-sight and satellite datalinks and was able to fly directly to its designated target, guided by its GPS. The AWS was able to loiter for up to four hours.

AWS – Technical Data

Length	10.9 ft
Diameter	13.5 in
Weight	620 lb
Payload	200 lb
Range	1,000 nm

In April 2002, the U.S. Navy awarded Titan Corporation a \$25.7 million contract to develop the AWS. Titan later received a \$32.4 million modification to a previously awarded contract for the FY05 demonstration, test, and evaluation phase of the AWS. Additional funding was provided in July 2006.

The FY07 defense bill from the House of Representatives included \$27 million for the AWS program. This funding helped complete the system design and demonstration phase as well as support some live-fire tests. Work under this program has concluded.

Work on the AWS occurred at the company's San Diego facility. BAE Systems provided the ASW launching system. L3 Communications has since purchased Titan.

The AWS was one of several systems under consideration by the Navy to meet a proposed Multipurpose Loitering Missile requirement (see Multipurpose Missile entry).

In February 2005, the Defense Advanced Research Projects Agency (DARPA) contracted Titan to work on a Block II version of the AWS known as AWS Long Gun. This project was part of the U.S. Army's Future Combat Systems program. The Block II version offered increased range and loiter time as well as a hyperspectral seeker.

The Affordable Weapon System Long Gun (AWS-LG) program aimed to evaluate and develop a reusable, long-endurance, low-cost, joint unmanned/armed missile system combined with a low-cost hyperspectral seeker. According to DARPA, ducted fan propulsion

provided efficient thrust for long endurance. The low-cost hyperspectral seeker required no gyroscopic stabilization, and the missile was launched from a canister carried on a sea or ground vehicle.

The Long Gun missile flew to a specified target area and used a hyperspectral seeker operating in visible and near-infrared wavelengths to search for targets. If a qualified target was found, the missile attacked the target with a self-contained munition. If no targets were found, the missile could either be refueled in air or commanded to return to base. The missile included a datalink back to a human controller/operator to confirm target characteristics, approve engagement, and perform battle damage assessment.

The AWS Block II had a unit price around \$100,000.

Boeing's work on its own Affordable Weapon System is separate from the efforts performed by Titan.

Navy Shows Interest in Loitering Missile

Multipurpose Missile. The U.S. Navy is considering the development of a new loitering attack missile. The service wants an inexpensive missile that fills the gap between naval guns and more expensive strike missiles (such as the Tactical Tomahawk).

Besides Titan, which would like to see the AWS meet this need, Raytheon is working on the Multipurpose Loitering Missile (MPLM) system. The company is teamed with Aerojet on this project.

The Raytheon-funded concept will incorporate the use of a two-way satellite datalink to allow designation to

targets of greater priority while in flight and the use of a seeker to reduce target location error. The system will be compatible with both vertical launch systems (VLS) and self-contained canister launchers.

The system's airframe completed a successful vertical launch on December 5, 2005, from a Mk 14 ground launch canister. This test took place at the Naval Air Warfare Center, Weapons Division Land Range, China Lake, California.

The United Kingdom may also be interested in a loitering cruise missile.

New AWS. In 2007, the U.S. Navy announced its interest in a new Affordable Weapon System. The new

AWS is designed to destroy a wide variety of targets but cost no more than \$250,000 apiece. The production run of the system could reach 1,200 over 15 years.

Boeing won a contract in 2008 for work on an Affordable Weapon System that may be related to this effort.

Other Light Strike Missiles. The United States and other countries are working on lightweight strike missiles that will meet different and perhaps multiple requirements.

Raytheon offers the Griffin, which arms U.S.-operated unmanned air vehicles (UAVs). The Griffin uses GPS satellite, inertial, and laser guidance systems.

Griffin – Technical Data

Length	42 in
Diameter	5.5 in
Weight, w/launcher	45 lb
Range, ground launch	3.5 mi
Range, air launch	7-9 mi

There are two versions of the Griffin: the air-launched A, for use from aircraft such as the MC-130W Combat Spear, and the tube-launched B model, which can be fired from UAVs, ground vehicles, and helicopters. The B model is hard launched off a rail.

The U.S. Special Operations Command (SOCOM) was the first customer for the Griffin and called it the Special Operations Precision Guided Munition (SOPGM).

The Pentagon has given the air-launched Griffin the designation AGM-176.

The U.S. Navy planned to place a version of Griffin on its Littoral Combat Ships (LCSs). The Griffin would replace the Non-Line-of-Sight (NLOS) missile that was canceled in 2010. Then, the U.S. Navy switched to the HELLFIRE.

The U.S. Navy also will field a longer-range missile. Raytheon and Kongsberg will provide a version of the Naval Strike Missile (NSM).

Northrop Grumman Innovation Systems (formerly Orbital ATK) is working on the Hatchet munition program, which is being funded by the U.S. Air Force Research Laboratory. The Hatchet is 12.5 inches long and features a miniaturized seeker from the Laser Joint Direct Attack Munition (JDAM) warhead made by Elbit Systems.

Lockheed Martin is building the Small Smart Weapon (SSW), which is named Scorpion. The weapon is adaptable to multiple launch platforms, including manned or unmanned systems. The Scorpion can be fired from various tube launch systems, including the M299 and M310, which can be used with the HELLFIRE missile.

Scorpion – Technical Data

Length	21.5 in
Diameter	4.25 in
Weight, missile	Less than 35 lb
Weight, warhead	20 lb
Range, maximum	10 nm

The missile offers four guidance system options: semi-active laser (SAL) seeker for man-in-the-loop terminal guidance, imaging infrared (I2R), shortwave infrared (SWIR), and millimeter wave (MMW).

The U.S. Central Intelligence Agency (CIA) is using the Scorpion on its UAVs.

Another Raytheon project is the Small Tactical Munition (STM), which is an unpowered weapon that uses GPS and semi-active laser guidance. Development of the system began in 2008.

NSFS

STM – Technical Data

	<u>Phase I</u>	<u>Phase II</u>
Length	21 in	22 in
Weight, missile	13 lb	11.9 lb
Weight, warhead	7 lb	5 lb
Range, maximum	7-9 mi	7-9 mi*

*Estimate

Raytheon is examining a power version of the STM.

guidance (although other sources say a laser guidance system is used).

Israel Military Industries (IMI) has developed the Whip Shot. This small missile weighs 15 kilograms and delivers a 6-kilogram warhead. The Whip Shot's range is 5 kilometers, and it uses GPS and inertial navigation

Advanced development testing of this system began in 2012.

Funding

No funding for the LASM and ALAM programs has been included in the U.S. Navy's most recent budget. DARPA and the Navy spent money on the study of less expensive weapons, such as the Affordable Weapon System. Sufficient funding was available in 2006 to carry the AWS program into 2007. The House Armed Services Committee inserted money for AWS into the FY08 budget, but the additional funding was not approved by the Senate. Further money did appear in FY09 budget documents.

The Littoral Combat Ship Surface Warfare (SUW) Mission Package (PE#0603581N) project has transitioned to LCS Mission Modules (PE#0603596N). This project supports work on new weapons for the LCS class, such as the Surface-to-Surface Missile Module.

Funding for the Long Range Attack Missile is contained within PE#0605450M Joint Air-to-Ground Missile (JAGM), 1110 Long Range Attack Missile (LRAM). Previous funding for the LRAM was contained under PE#0604212M.

U.S. FUNDING*

	<u>FY22</u> <u>QTY</u>	<u>FY22</u> <u>AMT</u>	<u>FY23</u> <u>QTY</u>	<u>FY23</u> <u>AMT</u>	<u>FY24</u> <u>QTY</u>	<u>FY24</u> <u>AMT</u>	<u>FY25</u> <u>QTY</u>	<u>FY25</u> <u>AMT</u>
U.S. Navy								
RDT&E								
PE#0605450M								
Long Range Attack Missile	-	-	-	-	-	-	-	20.7
PE#0603581N								
LCS SUW	-	-	-	-	-	-	-	-
PE#0603596N								
LCS Mission Modules								
SUW Mission Package	-	-	-	3.0	-	0.9	-	-

*Figures from FY25 request.
All \$ are in millions.

Previous Funding Lines:

- PE#0603114N Power Projection Advanced Technology. Proj R3006 Affordable Weapons.
- PE#0603795N Land Attack Technology. Proj 9359 Affordable Weapon System.
- PE#0603795N Land Attack Technology. Proj 2156 Naval Surface Fire Support.
- PE#0603795N Land Attack Technology. Proj 9999 Congressional Adds. More AWS funding.
- PE#0603286E Advanced Aerospace Systems AWS Long Gun.

Contracts/Orders & Options

On May 29, 2012, Raytheon Missile Systems Co, Tucson, AZ, received an \$8,168,950 firm-fixed-price contract. The award is a modification of an existing contract to procure Griffin standoff precision-guided munitions and provide engineering services support. Work was performed in Tucson and had an estimated completion date of Dec 31, 2012. One bid was solicited, with one bid received. The U.S. Army Contracting Command, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-10-C-0239](#)

On May 18, 2012, Raytheon Co, Tucson, AZ, was awarded an \$85,500,000 firm-fixed-price/cost-plus-fixed-fee (FFP/CPFF) contract to procure Griffin missiles. The first order is for 22 all-up rounds and 43 telemetry rounds. Work was to be performed in Tucson and was to be completed by Jul 31, 2013. AAC/PKES, Eglin Air Force Base, FL, was the contracting activity. [Contract Number FA8677-12-D-0037](#)

On Nov 2, 2011, Raytheon Missile Systems Co, Tucson, AZ, won a \$9,321,529 FFP contract modification to procure additional Griffin missiles in support of U.S. Special Operations Command. The following Griffin missiles would be purchased via this modification: 70 Griffin Block II A all-up rounds and 21 Griffin Block II A telemetry rounds. The primary location of performance is Raytheon, Tucson. Air Armament Center Contracting, Advanced Programs Division, Eglin Air Force Base, FL, was the contracting activity. [Contract Number FA8677-11-C-0115; P00008](#)

On Aug 15, 2011, Raytheon Missile Systems Co, Tucson, AZ, was awarded an \$11,506,829 FFP/CPFF contract. The award provided for the procurement of Griffin standoff precision-guided munitions and associated engineering services support. Work location was to be determined by task order, with an estimated completion date of Sep 30, 2012. One bid was solicited, with one bid received. The U.S. Army Contracting Command, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-10-C-0239](#)

On Aug 5, 2011, Raytheon Missile Systems Co, Tucson, AZ, received an \$11,542,035 FFP/CPFF contract. The award provided for the modification of an existing contract to procure the Griffin standoff precision-guided munitions and associated engineering services. Work was performed in Tucson, with an estimated completion date of Sep 30, 2012. One bid was solicited, with one bid received. The U.S. Army Contracting Command, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-10-C-0239](#)

On Jul 14, 2011, Raytheon Missile Systems Co, Tucson, AZ, was awarded a \$9,118,430 contract modification for procurement of four Griffin Block II A telemetry rounds (part number 2292000-25) and 74 Griffin Block II A all-up rounds (part number 2292000-26), including shipping, engineering services, and development costs. AAC/PKES, Eglin Air Force Base, FL was the contracting activity. [Contract Number FA9200-11-C-0180; PZ0003](#)

On Jun 9, 2009, Raytheon Missile Systems Co, Tucson, AZ, won a \$14,489,999 FFP with CPFF line items contract for Griffin A & B munitions and engineering services. Work was performed in Tucson, with an estimated completion date of May 31, 2010. The U.S. Army Contracting Command, Aviation and Missile Contracting Center, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-09-C-0517](#)

On Dec 24, 2008, Raytheon Missile Systems Co, Tucson, AZ, received an FFP with CPFF line items contract for Griffin munitions and engineering services. Work was performed in Tucson, with an estimated completion date of Aug 31, 2009. The U.S. Army Contracting Command, Aviation and Missile Contracting Center, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-08-C-0252](#)

In Nov 2008, the U.S. Naval Air Systems Command awarded MBDA a \$4.5 million contract for work on the Affordable Weapon System. This is a Phase II option contract.

On Sep 18, 2008, The Boeing Company, St. Louis, MO, received an \$8,571,775 modification to a previously awarded FFP contract ([N00019-08-C-0019](#)) to exercise an option for the Phase II study to develop innovative solutions for meeting the mission requirements of the AWS. Work was performed in St. Louis and was to be completed in Sep 2009. The Naval Air Systems Command, Patuxent River, MD, was the contracting activity.

On Aug 13, 2008, Raytheon Missile Systems Co, Tucson, AZ, was awarded a \$6,057,283 FFP with CPFF line items contract for Griffin munitions and engineering services. Work was performed in Tucson and was expected to be completed by Aug 31, 2009. The U.S. Army Aviation and Missile Command, Redstone Arsenal, AL, was the contracting activity. [Contract Number W31P4Q-08-C-0252](#)

NSFS

On May 23, 2008, Raytheon Missile Systems Co, Tucson, AZ, received a \$10,250,000 FFP contract for Griffin ammunitions. Work was performed in Tucson and was completed by Mar 31, 2009. The U.S. Army Aviation and Missile Command, Redstone Arsenal, AL, was the contracting activity. Contract Number W31P4Q-08-C-0252

On May 8, 2008, Raytheon Missile Systems Co, Tucson, AZ, was awarded a \$9,395,581 FFP contract with CPFF items for Griffin munitions and engineering services. Work was performed in Tucson and was completed by Dec 31, 2008. The U.S. Army Aviation and Missile Command, Redstone Arsenal, AL, was the contracting activity. Contract Number W31P4Q-08-C-0252

In May 2005, Titan (International Systems LLC) was awarded a \$32.4 million contract modification for the demonstration, test, and evaluation of the AWS. Work was to be completed by Sep 2006. Contract Number N00024-04-C-6301

In Feb 2005, Titan (International Systems LLC) received a \$2.5 million increment as part of a \$5.7 million contract for Phase 1 of the Future Combat Systems Long Gun program. Work was completed by Dec 31, 2005. Contract Number HR0011-05-C-0005

In Mar 2004, Titan (International Systems LLC) was awarded a \$22.5 million contract to design, develop, and test a prototype AWS. Work was completed in Dec 2004. Contract Number N00024-04-C-6301

Worldwide Distribution/Inventories

User Country. The **United States Navy** will be the initial operator of any new naval fire support missile.

Forecast Rationale

The United States is worried that a major war could consume its existing munitions stockpiles far more quickly than previously thought. Furthermore, the Pentagon worries that the high cost of its long-range weapons and a fragile supply chain will prohibit the quick replacement of this inventory with new units.

The U.S. Navy is working to boost the firepower of its surface combatants. U.S. naval officers have long warned of the declining ability of U.S. warships, on their own, to inflict heavy damage on maritime and land-based targets. The U.S. surface fleet needs to go "back to basics" and "dramatically reshape" itself, according to many senior officers.

In the near term, the U.S. Navy has armed its Littoral Combat Ships with a new strike missile. Raytheon's Griffin was to be the initial missile deployed, but the U.S. Navy changed its mind and decided to acquire the Longbow HELLFIRE missile instead.

A second missile offering greater range and an enhanced guidance system followed. The U.S. Navy selected Kongsberg and Raytheon to provide a version of the NSM. The NSM is already in production for the Royal Norwegian Navy and other customers.

None of these missiles is a long-term solution to the U.S. Navy's firepower needs. This is the responsibility of the Offensive Anti-Surface Warfare (OASuW) program. Under OASuW Increment I, Lockheed Martin will provide an air-launched version of its Long Range Anti-Ship Missile.

The U.S. Navy geared OASuW Increment II toward meeting the advanced 2024 threat. This missile would equip warships and combat aircraft with a submarine-launch capability appearing in the future. Later, the U.S. Navy deferred OASuW Increment II, opting for incremental upgrades of the LRASM until the new missile is available.

Now, the U.S. Navy is looking for a low-cost stand-off missile that can be procured in large numbers perhaps in a short period. The U.S. Marine Corps might acquire the Long-Range Attack Missile (LRAM), while the Navy is considering the possible procurement of the Multi-mission Affordable Capacity Effector (MACE).

The U.S. Navy will probably fulfill its future missile requirements with a number of different systems. These new missiles could be acquired at a relatively low price per unit and at a higher annual rate than existing systems. These munitions lines could contain a high surge rate.

The HELLFIRE is meeting the LCS Missile requirement. The forecast for the Advanced Strike Missile represents the potential for procurement of a new system or systems rather than a specific weapon or program. As more information becomes available, this forecast could easily split into multiple lines.

The planned number of missiles the U.S. could acquire or over what duration is unknown. The forecast shows potential activity and should be viewed with caution.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program	High Confidence				Good Confidence			Speculative			Total	
	Thru 2024	2025	2026	2027	2028	2029	2030	2031	2032	2033		2034
Lockheed Martin Missiles & Fire Control												
LCS Missile												
	374	14	10	10	15	15	35	43	52	60	66	320
MFR Not Selected												
Advanced Strike Missile												
	0	0	222	234	251	293	278	255	217	198	190	2,138
Total	374	14	232	244	266	308	313	298	269	258	256	2,458