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The Army's Self-Propelled Howitzer Modernization (SPH-M) Effort

Background

The Army's current self-propelled artillery system, the M-109 Paladin, first entered service in the 1960s and has been upgraded numerous times. The Army has two types of artillery: self-propelled, a howitzer mounted on a tracked or wheeled vehicle, or towed, a howitzer towed by a vehicle and then dismounted to fire. In 1994, the Army began to develop the Crusader, an advanced self-propelled 155-millimeter (mm) howitzer and an accompanying resupply vehicle. The Crusader was canceled in May 2002 when then-Secretary of Defense Donald Rumsfeld stated that future enemy threats did not require the Crusader and that the Department of Defense wanted instead to invest in other emergent technologies. The Army's second attempt to develop a new self-propelled artillery system, the Non-Line-of-Sight Cannon (NLOS-C), was to be developed as part of the Army's Future Combat System (FCS) program, which started in 1999 and was cancelled in 2009 when then-Secretary of Defense Robert Gates restructured the program and cancelled its associated vehicles. The third attempt for a new system was the Extended Range Cannon Artillery (ERCA) program (see **Figure 1**).

Figure 1. ERCA Prototype



Source: U.S. Army, "ERCA Autoloader is being tested for first time at YUMA Proving Ground," August 15, 2019.

The ERCA program started in 2018 and reportedly was intended to

extend the range of artillery fire from 30 kilometers to 70 kilometers (43.5 miles). This would have given the Army a significant advantage on the battlefield. Unfortunately, the new design, which featured a 30-foot gun tube mounted on a Paladin M109 chassis, experienced problems during live-fire testing. These issues prevented the ERCA from reaching its projected range and forced the Army to abandon the project.

Reportedly, the major testing issue was excessive wear on the gun tube after firing a relatively low number of rounds. The Army discontinued the ERCA program in April 2024.

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The SPH-M effort was previously known as the Next Generation Howitzer (NGH) Program. The SPH-M Effort replaces the ERCA program and is the fourth attempt to develop a new self-propelled howitzer. In the aftermath of the ERCA cancellation, the Army initiated a new conventional fires study in 2023 to determine the way ahead for artillery modernization. The study was completed in March 2024 and reportedly determined "the service should focus on more autonomous artillery systems with greater range and improved mobility."

SPH-M Requirements

According to Army FY2025 budget documents,

The Next-Generation Howitzer (NGH) will provide highly mobile, survivable, versatile, transportable, longer range fire support under a broad set of challenging operational conditions against current and emerging, small to large scale threats through 2040 and beyond. NGH reduces emplacement and displacement times, provides increased crew survivability and better cross-country mobility, adds overall effectiveness, and affords improved fire support capability for field artillery formations well beyond what towed howitzer systems can provide.

SPH-M Program Activities

The Army reportedly conducted a number of successful tests with the ERCA before cancelling the program; those past testing activities are to inform the SPH-M program. For example, in 2022, ERCA hit a target at 70 kilometers (43 miles) with an M-982 Excalibur extended-range guided artillery shell.

On August 28, 2024, the Army issued a request for information (RFI) to industry to

identify and preliminarily review the maturity of potentially offered self-propelled howitzer systems. The U.S. Government (USG) is interested in systems that have high maturity and minimize or eliminate development time. Additionally, the USG is interested in understanding the possible future modernization options for those systems. Any information received in response to this survey will be used by the USG to assess the viability of potential future acquisition strategies. When responding, the USG encourages industry to present

both mature systems that are in service as well as systems that could be in service by 2026, absent any USG investment.

The Army's RFI suggests the Army is interested only in artillery systems that are currently in service or close to being fielded in the next two years, including foreign artillery systems.

Army Awards SPH-M Demonstration Contracts

On October 14, 2024 the Army announced,

The awarding of five contracts for the Army's upcoming Self-Propelled Howitzer Performance Demonstration. The contracts were awarded to: American Rheinmetall Vehicles, BAE BOFORS, Hanwha Defense USA, General Dynamics Land Systems, and Elbit Systems USA. The contracts were awarded under Other Transaction Agreements (OTA) and the total award value for all contracts is approximately \$4 million ... The Army intends to complete all vendor performance demonstrations by the end of 2024 with the goal of determining if operationally suitable solutions exist to progress into a follow-on competitive evaluation that may lead to a future production contract.

Completion of SPH-M Demonstration

Reportedly, the Army is plans to conclude its performance demonstrations "to assess five vendors' mobile tactical cannon solutions by mid-December 2024," with follow on efforts continuing in 2025. Army officials have reportedly noted that there is a "sense of urgency" involved with the overall SPH-M effort, suggesting that "potential adversaries now can outgun the Army when it comes to range. The goal is to extend current cannon ranges from around 30 kilometers to 50 to 70 kilometers by 2030."

Congressional Activity

Some Members of Congress are concerned about the Army's fourth attempt to develop a new self-propelled howitzer. S.Rept. 118-188 to accompany S. 4638, the National Defense Authorization Act for Fiscal Year 2025, notes, on page 29,

Though the Army cancelled its Extended Range Cannon Artillery (ERCA) program, a recently conducted tactical fires study validated the capability gap that the ERCA sought to fill. Observations from Ukraine reinforce the critical role of mobile cannon artillery. The extensive employment of unmanned aerial systems and near ubiquitous sensing only increase the risks to the Armored Brigade Combat Team (ABCT) and the Stryker Brigade Combat Team (SBCT) on the modern battlefield. The committee is interested in how the Army is seeking to rapidly identify and field improved cannon artillery to these formations. The committee supports Army efforts to achieve requirements by identifying currently available

capabilities or rapidly improving our own systems. Accordingly, the committee directs the Secretary of the Army to provide a briefing to the Committees on Armed Services of the Senate and the House of Representatives, not later than March 31, 2025, on its long-range cannon modernization effort. The briefing should include:

- (1) An assessment of how current ABCTs and SBCTs long-range cannon fires capabilities would perform in a scenario such as Ukraine;
- (2) A description of what new vehicles or programs are being considered to fill the stated requirement; and
- (3) A comparison of cost to modernize through employment of, or modification to, existing platforms versus the cost to a new start program. A new start program estimate should consider total costs, including developmental, acquisition, sustainment, and operational costs.

Potential Issues for Congress

Congress may consider the following issues:

Is SPH-M the Army's Final Option to Replace the M-109 Paladin?

The Army's two previous attempts to develop a new Paladin replacement—Crusader and NLOS-C—ended in cancellation. The third attempt—ERCA—was not focused on a new design, but instead on modifying the M-109 and developing new artillery munitions; it proved unsuccessful and was cancelled in 2024. The August 2024 Self-Propelled Howitzer RFI focuses on domestic and foreign artillery systems currently in service or close to being fielded. This could be viewed as the Army's "last chance" to replace the M-109 Paladin short of initiating a new original design effort. Given the Army's history in developing new self-propelled howitzer systems, Congress may consider whether this compels the Army to choose an artillery system already on the market to replace the M-109.

Potential Total Program Cost

If the Army identifies potential candidate systems after the SPH-M Performance Demonstration, it should be possible for the Army to establish a preliminary estimated total program cost. The Army could also identify any related artillery munitions developmental efforts and develop a preliminary cost estimate. The early establishment of a preliminary estimated total program cost for SPH-M and associated ammunition could greatly facilitate congressional oversight and consideration of whether the estimated cost is appropriate for the capabilities being acquired.

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