FUTURE INDIRECT FIRES USA

The U.S. Army's

Top Strategic Priorities for Long-Range Precision Fires

Introduction

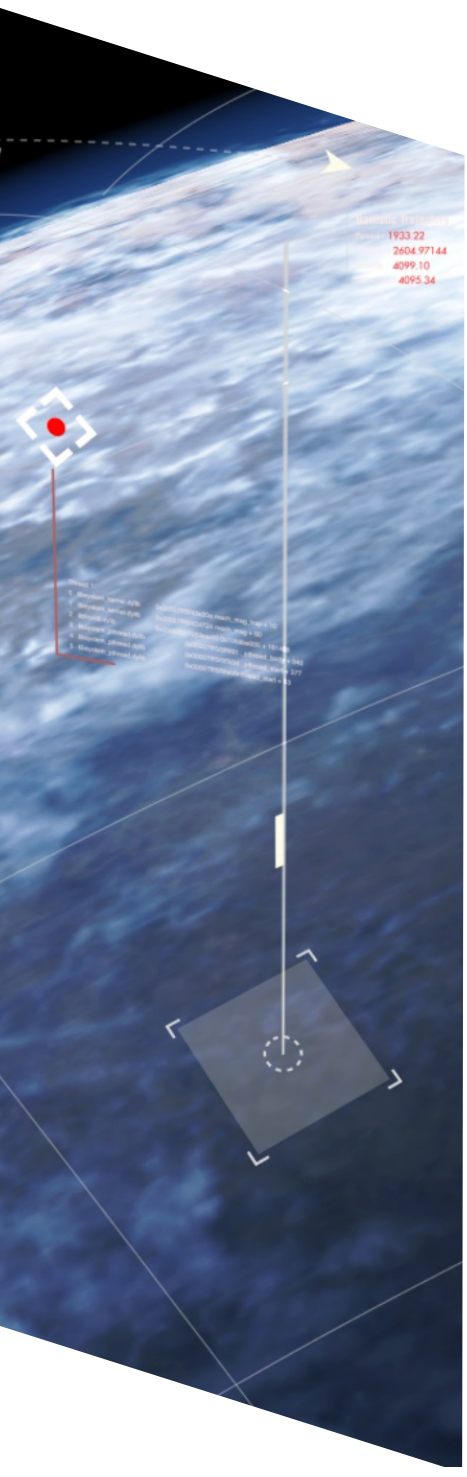
In November of 2017, the U.S. Army released Directive 2017-33 which established the creation of the Army Futures Command Task Force and outlined six top modernization priorities. At the top of the list? **Long Range Precision Fires (LRPF)**. Dubbed "the king of battle," the LRPF family of technologies is expected to replace the Army Tactical Missile System by 2023 and, according to the U.S. Army will be used to "attack, neutralize, suppress and destroy targets using missile-delivered indirect precision fires. LRPF provides field artillery units with long-range and deep-strike capability while supporting brigade, division, corps, Army, theater, Joint and Coalition forces and Marine Corps air-to-ground task forces in full, limited or expeditionary operations. LRPF will provide the warfighter with an all-weather, 24/7, precision surface-to-surface deep-strike capability." The major goals of this program include:

- **Develop long-range precision fires that ultimately can exceed 10,000 nautical miles**
- **Increasing the accuracy and range of Precision Strike Munition to 499 kilometers**
- **Increasing the rate of fire from one to two missiles per pod**
- **Improved energetics, increased efficiency and lower cost per missile**
- **The creation of smart, fast interconnected weapons**
- **Lower cost per missile**

In 2020 the Army wants to spend $1.3 billion improving its howitzers and rocket launchers and developing new, longer-range munitions. However, though LRPF remains a top military modernization priority, the program has undergone a number of changes over the past few years in response to shifting geopolitics and prerogatives. In this article, we explore the top priorities, recent developments and the future of the LRPF program.

Priority #1

Extended Range Cannon Artillery (ERCA)



A next-generation **Extended Range Cannon Artillery (ERCA)** prototype is being developed for fielding in 2025 and will be an improvement to the latest version of the Paladin self-propelled howitzer that provides indirect fires for the brigade combat team and division-level fight. The updated ERCA will provide a "10x" capability through a combination of an increased range, increased rate of fire, increased lethality, increased reliability and a greater survivability. The U.S. Army expects to invest **$135 million** in the program from FY2020-FY2024.

The ERCA will consist of two parts—a new rocket-boosted shell, the XM1113, and a longer howitzer barrel. In addition to longer range, ERCA will have a longer cannon rifle tube, a fully automated ammunition loading system and a communications system that will work in GPS-denied environments. RDECOM's Ground Vehicle Center is developing high-voltage components that will give the ERCA system more power to maintain overmatch against evolving threats. For example, by replacing a four-channel distribution box with a 12-channel high-voltage power controller, ERCA will not only have significantly more capability, but also improved reliability and safety. These changes will enable the system to distribute all of the electrical power that it can generate without negatively impacting space and weight.

RECENT DEVELOPMENTS

In the fall of 2018, the Army conducted demonstrations of the new XM1113 and Excalibur M982 munitions from a prototype Extended Range Cannon Artillery, or ERCA self-propelled howitzer. During testing, the XM1113 projectile exceeded 72 km. The Excalibur M982, a Global Positioning System-guided, extended-range artillery projectile, also increased in range, going from 40 to 62 km. The Army also made improvements to the XM30 Guided Multiple Launch Rocket System, or GMLRS, nearly doubling its range to 140 km. They were able to accomplish this by moving control fins to the rear of the device, making the nose more aerodynamic, equipping the device with a light-weight composite motor and adding a propellant.

Priority #2

Precision Strike Missile (PrSM)

As part of the LRPF program, the U.S. army is looking to develop a new Precision Strike Missile (PrSM) described by the U.S. Army as "a surface-to-surface, all weather, precision-strike guided missile fired from the M270A1 Multiple Launch Rocket System (MLRS) and the M142 High Mobility Artillery Rocket System (HIMARS). The baseline missile, which will be developed and fielded to engage a wide variety of targets at ranges up to 499 km, will emphasize imprecisely located area and point targets. Primary emphasis for follow-on spirals will be on increased range, lethality and engagement of time sensitive, moving, hardened and fleeting targets." The U.S. Army has requested **$600 million** over FY2020-2024 to support the PrSM program.

PrSM Specifications include:

- Replaces ATACMS and doubles rate-of-fire with two missiles per launch pod
- 400-plus km ballistic missile with a cluster munition compliant payload
- Attacks critical and time-sensitive area and point targets
- Maintains or improves accuracy in partial Global Positioning System (GPS)-denied environments; plan for M-Code GPS integration
- Insensitive Munition compliant system
- Launcher compatibility with M270A1 MLRS and
- M142 HIMARS
- Technology upgrades via Open Systems Architecture
- Growth capabilities for follow-on spirals
- Includes Cyber Security requirements

Projected Activities

- 4QFY19: Prototype Demonstration Flight Tests
- 2QFY21: Critical Design Review
- 3QFY21: Milestone B
- FY23: Early Operational Capability

Recent Developments

Though Raytheon and Lockheed Martin were awarded a 3 year contracts to design and build PrSM prototypes in 2017 (worth $116.4 million and $73.8 million, respectively), in 2018 the Army pushed the engineering and manufacturing development back a year. However, the dissolution of the INF treaty has created a new sense of urgency around the PrSM program and the U.S. Army is now looking to accelerate the development of these systems. According to the Army's fiscal 2020 budget request, the PrSM weapon should reach a full-rate production decision in the third quarter of 2024.

Enhancing Land-to-Sea Capabilities

According to a March 2019 Defense News article, the science and technology program is developing seekers that will give PrSM the ability to go after ships and other emitting maritime targets. Right now, according to Rafferty, the service is taking components and flying them in different missiles to see how they work, and these components would be integrated into a PrSM when it's ready to go. The current requirement is a range up to 499 kilometers but is expected to increase.

Priority #3

Hypersonic Strategic Long-Range Cannon (SLRC)

Hypersonic Missiles use cutting-edge propulsion techniques to, essentially, incorporate the speed of a ballistic missile with the maneuvering capabilities of a cruise missile. Though still in development, the goal is to create a “hypersonic boost-glide weapon” capable of reaching at least Mach 5 in speed and with a range of at least 1,400 miles. Thee extreme velocity and precision of these weapons would allow the U.S. military to strike even the most difficult targets such as buried bunkers.

According to the 2020 budget, the service plans to spend **$1.18 billion** on **prototyping land-based hypersonic weapons through 2024, starting with a $228 million request in 2020**, through the Army Space and Missile Defense Command and Army Forces Strategic Command. They plan on having a “system flight test” for its Land-Based Hypersonic Missile in FY2023. Run by a new multi-service program office, all the services are working together to develop a Common Hypersonic Glide Body that can be customized based on launch platform (i.e. artillery, aircraft, or ships and submarines).

To compliment these Hypersonic systems, the U.S. Army is developing a Strategic Long-Range Cannon (SLRC) which would use a cannon barrel to launch artillery shells with built-in rocket boosters that ignite in mid-air to achieve a range of about 1,000 miles. Since the cannon is reusable, it would be significantly more cost-effective than using one-shot rockets for every phase of flight. Lower price per launch will help the Army to take out large numbers of lightly protected targets such as truck-borne missile launchers, radar antennas, and mobile command posts. So while hypersonic missiles will be reserved for the hardest and high-priority targets, the cannon will be used to take out larger, softer targets, such as mobile anti-aircraft batteries. According to Breaking Defense, the Army plans to spend **$305 million** over FY2020-2022 to refine and prototype this "super-gun" and related technologies.

Additional LRPF Program Updates & Investments

Land-Based Anti-Ship Missile (LBASM)

As a follow up to the PRSM program, the U.S. Army is looking to invest **$625 million** in the development of a Land-Based Anti-Ship Missile (LBASM) from 2022-2023. Though few details have been released on this project, the objective of the LBASM system would be to develop a missile capable of hitting moving targets such as ships.

DeepStrike External Link Missile Rocket Motor

In April 2019, Raytheon successfully completed a static test external link of its new DeepStrike external link missile rocket motor. The missile will be compatible with two launch systems of the US Army, the M270 multiple launch rocket system (MLRS) external link and the M142 high-mobility artillery rocket system (HIMARS). The rocket motor test brought the weapon one step closer to its maiden flight test, scheduled for this year. A previous milestone for the DeepStrike was the successful preliminary design review external link, in which the Army evaluated every aspect of the new missile's design, from its advanced propulsion system and innovative lethality package to its guidance system.

Extended Guided Multiple-Launch Rocket System

For tactical missiles, the Army is upgrading its Guided Multiple-Launch Rocket System (GMLRS) to an extended range version, GMLRS-ER. That more than doubles the range from 70 km to 150 (from 43 miles to 93). Both versions can be fired from either the tracked M270 or the HIMARS truck. The Extended Range GMLRS modification Full Materiel Release in is projected for FY21.

Smart, Fast, Interconnected Weapons

The U.S. Army Research Laboratory (ARL) is developing technologies to support collaborative weapons that are interconnected, precise, fast and smart. By sharing sensing, computing and navigating capabilities using a network of sensors, these weapons will send information back to the warfighter, including situational awareness to make informed decisions.

Improved Energetics and Efficiency

In December 2018, Researchers from the U.S. Army and top universities announced that they had discovered a new way to get more energy out of energetic materials containing aluminum, common in battlefield systems, by igniting aluminum micron powders coated with graphene oxide. Advances in energetics such as this increase firing range without adding additional volume or weight.

IDGA
Institute for Defense and Government Advancement

JOIN US!

FUTURE INDIRECT FIRES USA

AUGUST 20 - 22, 2019 | FORT SILL, OK

www.futureindirectfires.iqpc.com

DOWNLOAD AGENDA

REGISTER*

SPONSOR

*No Cost to Active U.S. Government, and Military