

Insider Insights: The Future of Firepower

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BACKGROUND

Geopolitical Context

The firepower dominance once held by the United States has quickly waned. Russian and Chinese developments in artillery and munitions have now closed the gap and renewed concerns about the potential effect of enemy ordinance on U.S. combat operations. Seeking to deny U.S. military access to key regions, Russia and China have [developed](#) longer-ranged artillery systems, new target acquisition techniques, and special munitions, such as precision, [thermobaric](#), [loitering](#), and [top-attack munitions](#). In response to this challenge, the U.S. Army aims to improve its delivery of long-range precision fires (LRPF) — one of the six key priorities outlined in the Army's most recent [modernization strategy](#).



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Prioritizing LRPF

Two critical factors in the Army's prioritization of LRPF are the dissolution of the [Intermediate-Range Nuclear Forces \(INF\) Treaty](#) and the recognition of Russian and Chinese anti-access, area denial ([A2/AD](#)) strategies.

The INF Treaty between the United States and Russia once prohibited indirect fire systems with ranges between 500 and 5,500 kilometers. Russia, long in violation of the treaty, and China, not a signatory to the treaty, have already fielded multiple rocket and missile systems with ranges well beyond 500 kilometers. Having stepped away from the INF treaty in 2019, the U.S. is now free to develop these systems as well.



Photo by Jason Cutshaw, U.S. Army. Source: dvidshub.net

Through A2/AD strategies, Russia and China seek to limit U.S. freedom of movement in both Europe and the Indo-Pacific. In response, the [Army's Multi-Domain Operations concept](#) calls for improved LRPF that enable forces to penetrate layers of enemy A2/AD capabilities by providing both offensive and defensive fires. [Strategically-postured LRPF](#) can support deterrence, provide 24/7 counterfire capability, and strike land and maritime targets without putting pilots or aircraft at risk.

Improving LRPF Delivery Methods

Under the direction of the Army Futures Command [cross-functional team for LRPF](#), LRPF capabilities will be improved by upgrading current artillery and missile systems, developing new longer-range cannons and hypersonic weapons, and modifying existing air- and sea-launched missiles and cruise missiles for ground launch.

The Army's [current LRPF delivery methods](#) include Army Tactical Missile System ([ATACMS](#)), High Mobility Artillery Rocket System ([HIMARS](#)), attack helicopters, unmanned aerial vehicles (UAVs), and air support from the Navy and Air Force. Unfortunately, these legacy methods are not always reliable due to adverse weather, terrain obstacles, and availability.



Photo by Lance Cpl. Emma Gray, U.S. Marines. Source: dvidshub.net

Strategic Efforts

The Army has four major strategic efforts to improve LRPF capabilities:

1. Extended-Range Cannon Artillery (ERCA)
2. Precision Strike Missile (PrSM)
3. Long-Range Hypersonic Weapon (LRHW)
4. Strategic Mid-Range Fires (SMRF)

Extended Range Cannon Artillery (ERCA)

The [ERCA program](#) is adapting the current [M109A7](#) self-propelled howitzer with new cannon and projectile technologies to drastically increase the system's range without needing to develop an entirely new system. In [testing](#), a modified prototype proved capable of hitting targets over 70 kilometers (~45 miles) away — more than doubling the 30-kilometer range of current Army systems. The Army had originally planned to field 18 ERCA prototypes in FY2023 but the program has experienced [delays](#).

Precision Strike Missile (PrSM)

The [PrSM](#) is a surface-to-surface, all-weather, precision-strike guided missile intended to replace the MGM-140 ATACMS. Fired from the Multiple Launch Rocket System ([MLRS](#)) and the HIMARS, PrSM provides a deep strike capability designed to attack critical and time-sensitive area and point targets throughout the battlefield. The PrSM was originally constructed not to exceed a range of 499 kilometers. After the dissolution of the INF treaty, however, the PrSM's range will exceed 500 kilometers (~310 miles) and [potentially](#) reach targets beyond 1,000 kilometers (~620 miles). The Army expects the PrSM system to [enter full-scale production](#) in 2025.

Long-range Hypersonic Weapons (LRHW)

The Army's [ground-based long-range hypersonic weapons](#) reportedly have a range of over 2,700 kilometers (~1,725 miles), are capable of flying five times faster than the speed of sound, are highly maneuverable, and operate at varying altitudes, making them exceptionally difficult for missile defense systems to intercept. With LRHW, the Army can engage critical targets, suppress enemy long-range fires, and overwhelm A2/AD capabilities. As part of the LRHW program, the Army, Navy, Air Force, and Missile Defense Agency are collaborating to field hypersonic weapon systems using a Common Hypersonic Glide Body ([C-HGB](#)). The combined effort allows the services to leverage one another's technologies while tailoring the C-HGB to meet specific requirements for air, land, and sea. The Army had planned to field a prototype LRHW battery by FY2023, however, numerous [testing issues](#) have caused delays.

Strategic Mid-Range Fires (SMRF)

The SMRF Weapon System leverages existing [Navy SM-6](#) and [Tomahawk](#) missiles and modifies them for ground launch. Also known as the [Typhon](#) missile system, the SMRF will provide the Army with a mid-range missile capability intended to hit targets at ranges between the PrSM (~310 miles) and the LRHW (~ 1,725 miles). The Army [received](#) its first of four expected SMRF systems in December 2022 and anticipates receiving the remaining systems on an annual basis.



Photo by MikeMareen. Source: istockphoto.com

EXPERTS



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INSIGHTS



How might LRPF efforts be a game-changer for future conflict?

Larry Dickerson

In a few words, it won't. Few systems can produce the kind of effect on warfare that came from the introduction of gunpowder, tanks, and aircraft. As warfare evolves, so must the weapons used by combatants. Arrows, muskets, artillery, and missiles provide soldiers with greater reach on the battlefield, widening the zone of conflict.



During the Second World War, German troops feared U.S. artillery more than Russian, especially due to its accuracy. The U.S. Army had over 200 field artillery battalions in Europe during the war operating a variety of towed and a growing number of self-propelled guns. Throughout the war, there were constant calls for more weapons and ones featuring greater and greater range.

While new larger caliber guns were introduced and certain existing ones retired, U.S. troops fighting in Korea experienced a shortage of ammunition and tubes. Planners misread the tea leaves and even the huge ammunition stockpiles leftover from World War II were insufficient to meet the needs of Korean War combat.

LRPF will extend the reach of U.S. Army artillery units and help to reduce dependence on aircraft to perform certain strike missions. This is not a panacea. LRPF is another tool for U.S. troops to use across an expansive battlefield dominated by water.

Aja Melville

LRPF offers an enhanced degree of adaptability and versatility to soldiers faced with a dynamic battlefield. Interchangeable boosters and warheads and the ability to launch from a variety of platforms while maintaining extended-range capacity make LRPF efforts a necessary step in maintaining a competitive advantage over the enemy.



Collaboration between the U.S. Marine Corps and the Army in enhancing LRPF capabilities further emphasizes their importance. LRPF anti-ship missiles, including the Maritime Tomahawk, ATACMS to PrSM, Long-Range Anti-Ship Missile (LRASM), Naval Strike Missile, and the SM-6 multi-role missile, offer a diverse set of tools to address different maritime challenges.

Additionally, LRPF systems provide extended operational range, enabling missiles to be launched from concealed positions. Artillery and missiles launched from concealed underground tunnels present less vulnerability than those launched from aircraft dependent on mid-air refueling or UAVs with limited payload capacity.



Photo by NiserIN. Source: istockphoto.com



How might LRPF still provide a strategic advantage amid a conflict in the Indo-Pacific?

Larry Dickerson

The Pacific Ocean presents a unique environment for militaries. In this theater, controlling certain land masses is of the utmost importance, thereby securing supply lines and bases for attacks against additional targets.



The key to the U.S. strategy during the Pacific campaign against the Japanese was the seizure of strategic islands that could then be used as bases for further operations. Japanese control of Midway Island would have threatened the Hawaiian Islands. Had Japan successfully held Guadalcanal, the island would have provided a base for aircraft to threaten the link between the U.S. and Australia, and a staging area of attacks on Fiji, New Caledonia, and Samoa. The U.S. seized Iwo Jima and then Okinawa to provide bases for an attack on Kyushu, which itself would provide the launch point for an attack on Honshu.

A future conflict in the Pacific Ocean region would include many similarities to the previous war, but the LRPF might make certain islands even more important to military planners. The LRPF could allow U.S. troops to threaten hostile forces over a far wider area than in the past, enabling fire support from land-based units to troops deployed on far-off shores.

The LRPF would lessen the need to expose aircraft carriers to hostile threats and pressure on ground troops to secure territory to open new air bases for support aircraft. Had a weapon similar to LRPF been available in World War II, the U.S. could have pounded Honshu from bases on Kyushu with impunity without risking pilots or warships. Conversely, Japanese control of Papua New Guinea and Guadalcanal would have threatened the shipping lanes to the eastern coast of Australia.

Aja Melville

Traditional military assets including aircraft and surface ships are limited by the vast geography of the Indo-Pacific region. However, LRPF systems can be launched using various platforms, providing flexibility in use amid unfavorable terrain.



In 2018, the Commission on the National Defense Strategy (NDS) for the U.S. published its independent, nonpartisan review of the 2018 National Defense Strategy. The review found that four of the five adversaries named in the NDS were based in the Indo-Pacific region — China, North Korea, Russia, and other terrorist groups. In December 2018, the Army introduced the Multi-Domain Operations (MDO) concept which aims to deter enemy threats by successfully integrating military forces across all domains, a key feature of the Joint Warfighting Concept. Both doctrines determined that improved LRPF are necessary to counter Russian and Chinese influence in the region and block Anti-Access/ Area Denial strategies.

A2/AD is a defensive strategy aimed at preventing enemy forces from operating in a specific area. LRPF capabilities allow military forces to reach deep inside A2/AD zones while minimizing collateral damage. The U.S. Marine Corps is working in conjunction with the Army to develop land-based, anti-ship missile options, with the goal of creating an effective Anti-Access/Area Denial space over land and sea, bolstering U.S. military presence and deterrence in the Indo-Pacific.

Additionally, in a situation where the military does not have the home field advantage, where spare parts and back-ups are limited to what can be transported quickly across an ocean, the fewer moving parts the better. The PrSM, for example, provides double the firepower with two missiles per launch pod, compared to current ATACMs, and can be launched from pre-existing M142 HIMARS and M270A1 MLRSs.



Which LRPF effort is the most important for future conflict and why?

Larry Dickerson

One of the main focuses of LRPF is to provide the U.S. Army with new longer-range theater missile systems. Development of such missiles had been restricted due to the 1987 INF treaty between the United States and the former Soviet Union. Under this treaty, the U.S. could not develop long-based theater ballistic missiles with a range of 500 kilometers or more. Of course, this agreement did not include China, which currently possesses the largest inventory of theater ballistic missiles in the world.



The ATACMS has been in service since the 1980s but offers limited range. The new PrSM (pronounced Prism) will replace ATACMS and features an initial range of 499 kilometers. Improved models will appear in the future, incorporating increased lethality and greater range, first to over 700 kilometers and then exceeding 1,600 kilometers.

The U.S. Army is also looking to acquire a medium-range missile to fill the gap between PrSM and proposed hypersonic weapons. A near-term solution for the Strategic Mid-Range Fires, formerly the Mid-Range Capability (MRC), could be the modification of an existing missile — the Standard Missile - 6 (SM-6). The range of the Block I version will fall between 500 and 1,500 kilometers.

Besides the SM-6, the U.S. Army will procure the Tomahawk cruise missile to meet part of its SMRF requirement. With these weapons, the reach of the U.S. Army unit deployed in the Pacific will extend well into potentially hostile territory and across the seas of the region.



Photo by Petty Officer 2nd Class Devin Langer, U.S. Navy. Source: dvidshub.net

Aja Melville

The C-HGB missile is the most innovative of the LRPF efforts. Hypersonic weapons distinguish themselves by their capacity to attain speeds five times that of sound, combined with the ability to operate at variable altitudes. The Army's LRHW program is poised to introduce a new class of fast, maneuverable, long-range missiles, with the C-HGB serving as a pivotal component of this program.



Unlike many LRPF efforts that follow ballistic trajectories, the C-HGB has the capability to operate at varying altitudes, maneuver, and change direction. This versatility makes the missile less predictable and harder to intercept for potential adversaries.

Additionally, the significance of the C-HGB lies in its collaborative development and utilization across different military branches. The Navy is responsible for its design, while the Army focuses on production, creating an industrial base. This cooperation necessitates sharing technological advancements and cooperating on resource allocation and expertise, firmly establishing the C-HGB as a critical component of future military capabilities.



Photo by Alexyz3d. Source: istockphoto.com

RELEVANT GOVEXEC ARTICLES

DEFENSE ONE

- [New Artillery Round Shoots Farther Than Some Missiles, Can Hit Moving Targets](#)

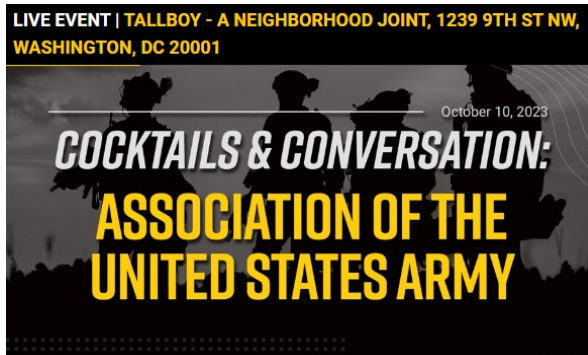
FORECAST INTERNATIONAL

- [Fire, But Don't Forget: A Look at Current Munition, Air Defense and Artillery System Markets](#)
- [From Crisis to Opportunity: Europe's Defense Industry Transformation in the Post-Ukraine Crisis](#)

MILITARY PERISCOPE

- [Army Aims To Field New Hypersonic Weapon This Year Despite Test Failures](#)
- [Australia Bulks Up](#)
- [Redefining Pacifism](#)

UPCOMING EVENTS



GLOSSARY

- Anti-Access, Area Denial (A2/AD)
- Army Tactical Missile System (ATACMS)
- Common Hypersonic Glide Body (C-HGB)
- Extended-Range Cannon Artillery (ERCA)
- High Mobility Artillery Rocket System (HIMARS)
- Intermediate-Range Nuclear Forces Treaty (INF)
- Long-Range Anti-Ship Missile (LRASM)
- Long-Range Hypersonic Weapon (LRHW)
- Long-Range Precision Fires (LRPF)
- Mid-Range Capability (MRC)
- Multi-Domain Operations (MDO)
- Multiple Launch Rocket System (MLRS)
- National Defense Strategy (NDS)
- Precision Strike Missile (PrSM)
- Standard Missile (SM)
- Strategic Mid-Range Fires (SMRF)
- Unmanned Aerial Vehicles (UAVs)

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