



Updated May 6, 2026

# Defense Primer: LGM-35A Sentinel Intercontinental Ballistic Missile

The LGM-35A Sentinel is envisioned as an intercontinental ballistic missile (ICBM) system that is expected to replace the Minuteman III (MMIII) ICBM in the U.S. nuclear force structure. MMIII has served as the ground-based leg of the U.S. nuclear triad—land-based ICBMs, submarine-launched ballistic missiles, and nuclear-capable bombers—since 1970. The Department of Defense (DOD), which is “using a secondary Department of War designation,” under Executive Order 14347 dated September 5, 2025, requested \$4.6 billion for the Sentinel in FY2027, mostly for research, development, test, and evaluation. The FY2027 budget request for the Department of Energy’s National Nuclear Security Administration (NNSA) included \$913 million for the W87-1 nuclear warhead for the Sentinel.

## What Is an ICBM?

A U.S. ICBM can reach targets around the globe in approximately 30 minutes after launch. In the first three minutes, three solid fuel rocket motors power the missile’s flight. After the powered portion of flight, the missile follows a parabolic trajectory toward its target. The missile releases its warhead during the midcourse portion of its flight, and the warhead continues to the target. Once the President authorizes the launch of any U.S. ICBM, the missile cannot be recalled or destroyed in flight. The same is true for nuclear missiles launched from U.S. submarines. In contrast, U.S. bombers can return to their bases without releasing their weapons; their weapons also cannot be recalled after their release.

The United States began deploying nuclear-armed ICBMs in 1959 and has maintained these systems “on alert,” or able to launch promptly, since that time. The Air Force deployed the Atlas between 1959 and 1965, the Minuteman beginning in the 1960s, and the Peacekeeper (or MX) between 1987 and 2005. The Air Force bases its ICBMs in hardened concrete silos, or launch facilities, located in North Dakota, Montana, Wyoming, Colorado, and Nebraska. The United States has periodically considered alternative ICBM basing concepts to ensure survivability.

## The Transition from Minuteman III

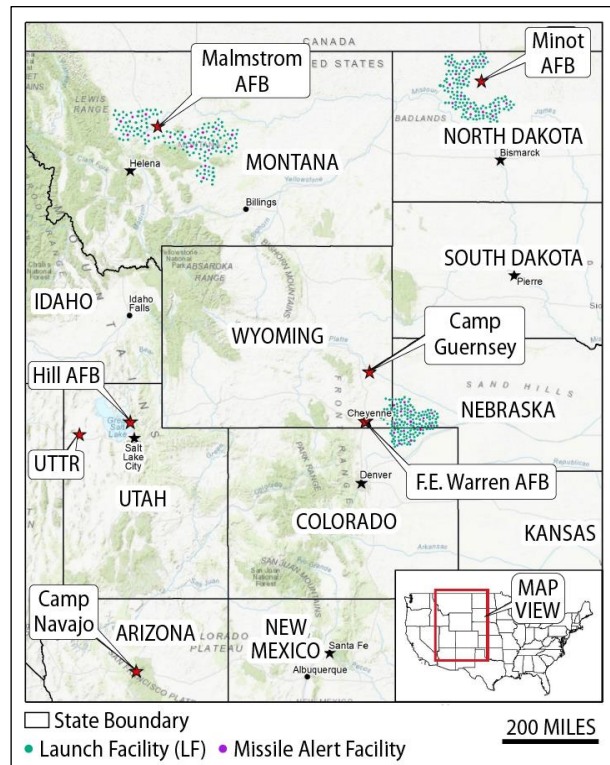
The MMIII, which currently is deployed in a single-warhead configuration that could carry up to three warheads, entered the force in 1970. The Air Force has replaced and updated many of the component systems on the missile—a process known as “life-extension”—several times over the past 50 years. The Air Force has stated that some of these components may face reliability concerns as they reach the end of their intended lifespans. After conducting an analysis of alternatives in 2014, the Air Force decided to replace MMIII with a new missile system (originally Ground Based Strategic Deterrent) that would

serve through 2075. The Air Force argued that, when compared with a life-extended MMIII, a new ICBM would meet current and expected threats, maintain the industrial base, produce a modular weapon system, and reduce life cycle cost. The Air Force and Northrop Grumman, the Sentinel’s lead defense contractor, planned for the Sentinel to begin replacing MMIII in 2029.

## Program Status

The Air Force plans to procure 634 Sentinel missiles, plus an additional 25 missiles to support development and testing, to enable the deployment of 400 missiles. The Air Force also originally planned to modernize 450 silos and more than 600 facilities (see **Figure 1**).

Figure 1. Sentinel Deployment and Support Locations



Source: Air Force Global Strike Command, 2023.

In January 2024, the Air Force informed Congress that the Sentinel program exceeded its initial cost projections, estimating at least a 37% increase (from \$118 million initial baseline cost to \$162 million in 2020 dollars) in cost per unit. This cost increase is known as a “critical” breach per the Nunn-McCurdy Act (10 U.S.C. §§4371-4377), which requires DOD to, absent termination, certify that the program is essential to national security, has no cheaper alternatives, and can be managed. Such a certification also

mandates that DOD develop new cost estimates and program milestones and submit this information to Congress. Air Force officials have attributed cost increases to ground infrastructure updates.

In July 2024, DOD announced completion of the Nunn-McCurdy review and that the program “met the statutory criteria to continue.” DOD officials said the review resulted in the rescindment of the Sentinel’s Milestone B approval and cited a cost estimate of a “reasonably modified” Sentinel at \$141 billion. Air Force officials have said that they are reexamining requirements and restructuring the program to make the ground segment “simpler” and “more affordable.” In December 2025, the Senate confirmed Air Force General Dale White, who was assigned as Direct Reporting Portfolio Manager to oversee several major Air Force acquisition programs, including the Sentinel.

In February 2026, the Air Force announced that it anticipates to “complete the [program] restructure and achieve a Milestone B decision by the end of 2026” and deliver an “initial capability targeted for the early 2030s.” In April 2026 testimony, General White restated this timeline and stated that “cost estimation will be completed in the summer.” The Air Force now plans to build new silos, instead of reusing old ones, a process that will reportedly require a supplementary environmental impact statement. The Army Corps of Engineers, rather than Northrop Grumman, reportedly will now manage some of the ground infrastructure updates. The Air Force said that it plans to conduct a pad launch in 2027 at Vandenberg Air Force Base in California. Northrop Grumman announced in April 2026 that it is producing solid rocket motors for the initial flight tests and constructing a prototype silo.

### Warheads

The Air Force plans to initially deploy the Sentinel with the W87-0 warhead currently on the MMIII. NNSA is developing the W87-1 warhead and plans to deliver a first production unit in FY2033. NNSA announced the qualification of the first war reserve plutonium pit for the W87-1 in October 2024. Lockheed Martin is developing the Mk21A reentry vehicle for the W87-1. DOD and NNSA are also modernizing the arming and fuzing assembly.

## Considerations for Congress

### ICBM Force Necessity

Some analysts have argued for the United States to reduce or eliminate its ICBMs because they increase the risk of accidental war or because the invulnerability of ballistic missile submarines makes ICBMs “redundant.” Advocates of retaining ICBMs have argued that these missiles are the most “responsive” leg of the U.S. nuclear triad. The 2022 Nuclear Posture Review (NPR), a Biden Administration review of U.S. nuclear policy, echoed past NPRs in stating that the three triad legs are “complementary,” with each one “offering unique attributes.”

### MMIII Life Extension

Some Members of Congress have questioned the need to fund and deploy new ICBMs; others have also suggested that the Air Force reconsider MMIII life extension. They, along with other commentators, have argued that a delay or

cancellation of the Sentinel could ease financial and other pressures caused by the simultaneous recapitalization of all legs of the nuclear triad. In 2021, DOD commissioned an independent study on future ICBM options, which recommended an assessment of MMIII life extension. However, the 2022 NPR endorsed the Sentinel and said that any alternative “would increase risk and cost.” Air Force officials stated in January 2024 that they did not see a “viable” long-term MMIII life extension, though they were “committed” to doing “everything [they] can to keep it in the field.” A September 2025 Government Accountability Office (GAO) study stated that the Air Force may operate the MMIII through 2050, though it faced parts obsolescence and other sustainment risks. In April 2026 testimony, General White stated that the Air Force “annually allocates” more than \$2 billion for MMIII sustainment and operations and is carrying out a strategy to “provide a critical bridge” through Sentinel deployment.

### Sentinel Costs and Schedule

Some Members of Congress have been concerned about the costs and schedule delays associated with the Sentinel, the W87-1 warhead, and NNSA plutonium pit production. Section 1629 of the National Defense Authorization Act for Fiscal Year 2025 (NDAA; P.L. 118-159) imposed conditional requirements on the program to ensure oversight and opportunities for competition.

### Risk of Sentinel Delays

Some Members of Congress have expressed concern about the risks associated with transition from the MMIII to the Sentinel. Since the FY2017 NDAA (P.L. 114-328, §1667), Congress has required that the Air Force deploy no fewer than 400 on-alert ICBMs. The FY2026 NDAA (P.L. 119-60, §1632) amended law (10 U.S.C. §9062) to reaffirm this minimum requirement and required that these ICBMs be deployed equally across “not fewer than 450” silos at F.E. Warren, Malmstrom, and Minot Air Force bases.

An Air Force official reportedly stated in January 2025 that MMIII and Sentinel operations would overlap for at least 15 years. The GAO report assessed MMIII-to-Sentinel transition risks and recommended that the Air Force develop a transition risk management plan. Section 1641 of the FY2026 NDAA mandated an Air Force strategy to sustain the MMIII and maximize its end-of-life margin.

In Section 1650 of the FY2024 NDAA (P.L. 118-31), Congress directed the Air Force to “develop a plan to decrease the amount of time required to upload additional warheads to the [ICBM] force.” Section 1633 of the FY2025 NDAA limited the availability of certain DOD funds pending the submission of this plan to Congress. The 2023 report of the Congressional Commission on the Strategic Posture of the United States proposed considering such upload to field “the same number of warheads” “if the number of available [ICBMs] is reduced.” The commission report also proposed that the Air Force consider deploying the Sentinel with multiple warheads or with “some portion of the future ICBM force” in a road-mobile configuration to account for evolving nuclear threats to the United States from Russia and China.

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