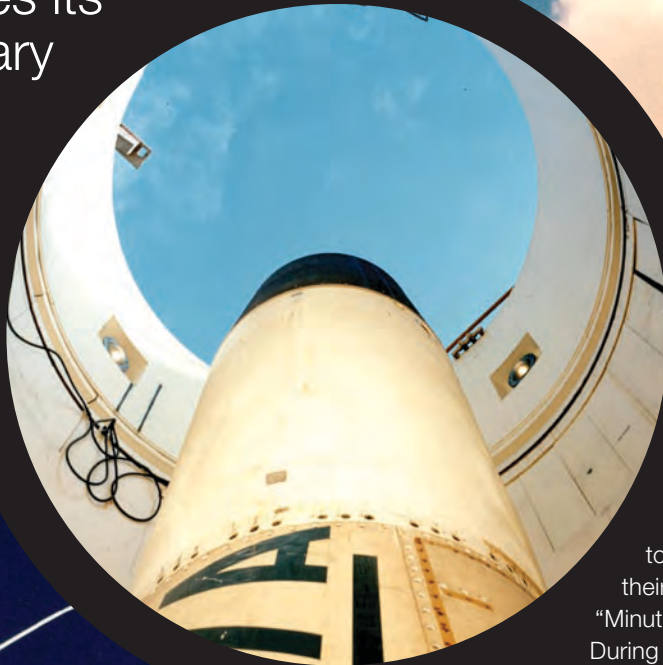


# Ace in the hole

The Minuteman program, the largest and longest running program in Boeing history, celebrates its golden anniversary

Test launches of the Minuteman missile took place at Cape Canaveral, Fla., as shown in the two launch photos here. This year marks the 50th anniversary of the Minuteman program.

BOEING ARCHIVES



By Michael Lombardi

**T**he defense of colonial America depended on an elite militia that could be counted on at a moment's notice to take up their muskets and protect their towns and villages. They were the "Minutemen."

During the Cold War, the defense of the United States again required an elite force that could be called upon at a moment's notice. While the mission was the same, the realities of modern warfare and advances in military technology made it necessary that the new Minuteman be a nuclear-armed ballistic missile. A Boeing-led team of defense industry partners worked to create and sustain the Minuteman, a program that marks its 50th anniversary this year and still serves a vital role in defending freedom.

In the early days of the Cold War, the United States concentrated its research and development efforts on aviation and nuclear weapons. The resulting leadership in these technologies gave America a military edge over the Soviet Union and created a deterrent to potential aggression.

That edge gradually eroded starting in 1955, when the Soviet Union successfully tested a hydrogen bomb. Over the next two years, that nation proceeded to surpass the United States in rocket technology. This became alarmingly clear to the American public when the Soviets launched Sputnik 1, the world's first sat-

ellite, in October 1957. The successful test of the hydrogen bomb coupled with the ability to put a satellite into orbit meant that the Soviet Union, in theory, could attack the United States with intercontinental ballistic missiles, a weapon for which there was no defense—other than the threat of nuclear response. The danger was so stark that it was considered a national emergency.

The United States made development of a reliable, rapid response, ballistic missile the highest priority. On Feb. 27, 1958, the U.S. Air Force received approval from the Department of Defense to begin research and development on the new missile, designated Weapon System 133-A and called the “Minuteman.”

The design of the Minuteman called for a three-stage, solid-fuel missile that was to be extremely reliable, quick to launch, have a high capability for survival, maximum simplicity, and be able to remain on alert in its silo round-the-clock for many years.

In October 1958, the Air Force announced its selection of Boeing as the assembly and test contractor for the Minuteman missile. This began one of the most complex, largest and longest running programs in Boeing history. At its peak, it would employ 39,700 people located at Boeing sites in Seattle and at the missile final assembly site in Ogden, Utah.

Thornton “T” Wilson, Boeing’s initial Minuteman program manager and, later, company chairman, said of Boeing’s role in the program: “We were involved in some complicated systems management tasks, where detailed planning, schedule discipline and safety were all important and had to be integrated and relied on in the program.”

To build, test and deploy the missiles, Boeing teamed with nine other contractors, including North American Aviation’s Autonetics Division in Anaheim, Calif. Autonetics, a pioneer of inertial guidance, was selected to develop the guidance and control systems for Minuteman. At the program’s height, nearly 30,000 employees were working on the design and manufacture of the precision inertial guidance system that gives Minuteman its incredible accuracy. (In 1996, Autonetics joined Boeing when Boeing acquired Rockwell International’s aerospace and defense businesses.)

The first launch of a Minuteman took place at Cape Canaveral, Fla., on Feb. 1, 1961, and within a month construction began on the first base for the missile. On Nov. 17, 1961, the first successful launch from a silo occurred, and one year later Initial Operational Capability was achieved.

The first operational Minuteman site was Malmstrom Air Force Base, Mont., where the first 10-missile “flight” was rushed into activation on Oct. 27, 1962, at the height of the Cuban Missile Crisis. U.S. President John F. Kennedy referred to the missiles as his “ace in the hole” during this historic standoff with the Soviet Union. Within five years, 1,000 missiles were operational in six wings based in Montana, Missouri, North Dakota, South Dakota and Wyoming.

In 1975, a modernized Minuteman force was stabilized at 450 Minuteman II and 550

Minuteman III missiles, with the last Minuteman III delivered from Ogden on Nov. 30, 1978. In all, Boeing had deployed 150 Minuteman IA, 650 Minuteman IB, 500 Minuteman II, and 550 Minuteman III missiles.

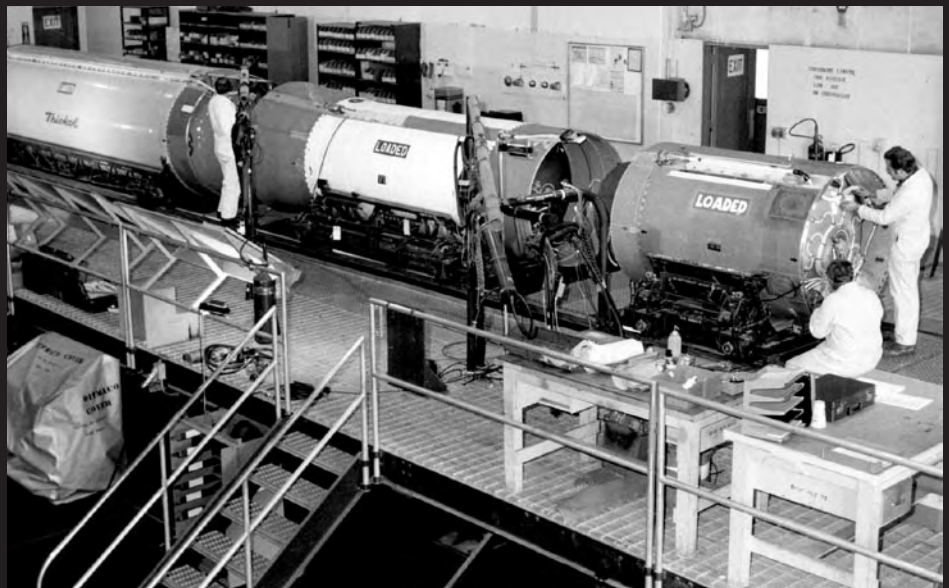
Today, 450 Minuteman III missiles continue to serve America as part of the United States Strategic Command that also includes the U.S. Navy’s Ohio-class ballistic missile submarines and Air Force B-2 and B-52 bombers. Boeing employees at Anaheim and Ogden continue to provide support, sustainment, testing, training and upgrades for Minuteman, including work on guidance, flight controls and the ground system. The largest upgrade is the Minuteman III Guidance Replacement Program. This highly successful program, scheduled to wrap up next month, extends the service life of the Minuteman’s guidance system to beyond 2020. Other Minuteman work at Boeing includes depot level repair of Minuteman III inertial guidance systems at the Boeing Guidance Repair Center in Heath, Ohio.

The Minuteman program was highly successful and established Boeing as a leader in large-scale system integration. Because of this, Boeing would be called upon by NASA to perform a similar function for the Apollo/Saturn program, directly contributing to the success of that program. Boeing’s competency in large-scale system integration was key to subsequent wins of major programs such as Ground-based Missile Defense and Future Combat Systems.

The Boeing leadership in managing complex programs and customer focus that made Minuteman a success is still evident on that program today. In a recent surprise audit by the Defense Department, the Boeing ICBM Systems program received a perfect 100 percent grade.

“After 50 years, that is remarkable,” said Peggy Morse, director of Boeing Strategic Missile Systems. “It shows how we pride ourselves on meeting the warfighter’s needs everyday with 100 percent accountability.” ■

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**The Minuteman missile’s final assembly site was in Ogden, Utah. By the time the last Minuteman was delivered in 1978, Boeing had deployed more than 1,800 missiles. BOEING ARCHIVES**