



## Delta-09 and the Minuteman II Missile



After the Cuban Missile Crisis in 1962, President John F. Kennedy called the Minuteman missile his “Ace in the Hole.”

The successful Soviet test of a hydrogen bomb in 1955 quickly eroded the United States’ sense of nuclear superiority. Only two years later, the Soviet Union successfully launched the world’s first satellite, Sputnik, into orbit. American military strategists feared the possibility that a Soviet intercontinental ballistic missile (ICBM), with a nuclear payload, was capable of reaching the U.S. In response, the Air Force developed three missile programs, the Atlas, Titan, and Minuteman. At the height of the Cold War, launch facility Delta-09 was one of 1,000 Minuteman missile silo sites across the Great Plains region, constructed in an effort to close the perceived “missile gap,” and deter nuclear war.

### Atlas and Titan, America’s First ICBMs

The first two generations of American ICBMs, the Atlas and the Titan, were fueled by a combination of liquid oxygen and kerosene or nitrogen tetroxide. These liquid propellants were problematic because they weighed down missiles, which reduced their

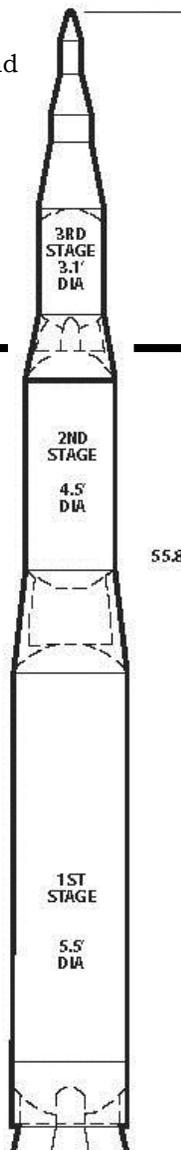
range. Liquid fuels were also highly volatile and therefore dangerous to work with. For this reason, fuel was stored outside the missile and loaded just prior to launch, which prolonged response time and required a large on-site crew. Despite their limitations, these systems offered significant advantages over earlier manned strategic weapons systems.

### The Minuteman Missile



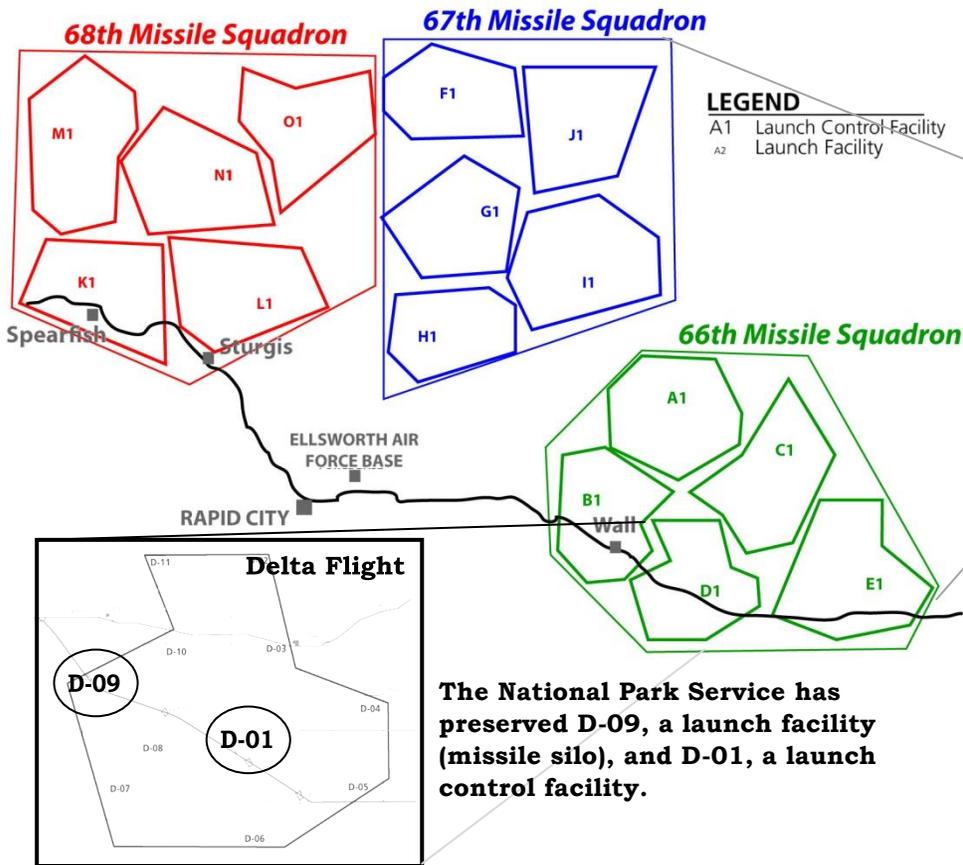
**Left, a Minuteman II test launch.**

**Right, cutaway of a Minuteman II Missile. Minuteman was a three-stage solid-fuel missile. The first stage launched the missile out of the silo and into the air with 167,000 lbs. of thrust, the second and third stages added an additional 68,100 lbs. of thrust, taking it to a speed of over 15,000 miles/hour.**



In 1956 work began on a solid-fuel system to rectify these problems. A design was approved in 1958, and by 1967, 1,000 Minuteman missiles were operational across the Great Plains region. The Minuteman missile was designed to be more efficient and reliable than its predecessors, and able to be mass-produced. The new design also allowed it to stand unattended for long periods of time in an underground silo, with only a small, off-site crew to maintain and operate it. Reminiscent of their Revolutionary War-era namesake, these missiles were built to be combat-ready the moment they were needed. The Minuteman II went on alert in 1966 with a larger warhead than its predecessor; at 1.2 megatons one Minuteman II warhead held over 70 times the power of Little Boy, the atomic bomb used at Hiroshima, Japan by the United States in 1945 to bring about the end of World War II.

## South Dakota and the Cold War



During the height of the Cold War, Minuteman missiles were operational in six missile wings across North and South Dakota, Wyoming, Montana, Colorado, Nebraska, and Missouri.



**Above, map of South Dakota's 44<sup>th</sup> Strategic Missile Wing.** All personnel were based out of Ellsworth Air Force Base, located about 70 miles west of launch control facility D-01. The 44<sup>th</sup> Strategic Missile Wing missile field held 150 missiles, and was divided into three squadrons, each with five groups of ten missiles called "flights." Each flight had its own launch control facility, which held a support crew and two missileers who could initiate a launch from their remote location.

## Top Secret?

The launch control facilities and missile silos of the Cold War, and even those that exist today, were never a secret. Many community members even participated in the construction. The locations of these sites were never kept secret from the Soviet Union, either. By making them visible, especially from the air, the Soviet Union

could count how many intercontinental ballistic missiles the United States possessed. By having 1,000, the U.S. hoped to outpace the Soviet Union in the nuclear arms build-up, to discourage an attack, and prevent a nuclear war.

## Launch Facility D-09

**LF D-09 was one of ten silos associated with Delta Flight. An eight-foot barbed-wire security fence surrounds the compound, protecting the Minuteman II ICBM.**

- 1 Minuteman Intercontinental Ballistic Missiles were "hidden in plain sight".
- 2 There were 150 Minuteman II missiles located in South Dakota.
- 3 A Minuteman missile would reach its target in less than 30 minutes.
- 4 The Minuteman missile was a technological wonder for its time.
- 5 The **Ultra High Frequency (UHF)** antenna is protected by a layer of cement and steel, making it "hardened," or resistant to damage by a nearby nuclear blast. The antenna allowed for air-to-ground communication with Looking Glass, an airborne command post flying a continuous airborne alert from 1961 to 1990. This aircraft could take control of and launch missiles in the event the launch control centers were destroyed by Soviet nuclear attack.

- 6 The **Support Building** extends about 11 feet below the ground. The building contains an emergency generator in case commercial power failed. This ensured that the silo could remain operational at all times. The support building also contained a chiller unit to maintain appropriate temperature and humidity levels; keeping the silo at about 60° F to keep the missile's components at peak efficiency.

Today 450 Minuteman III missiles are still operational across the Great Plains.

- 7 The **Personnel Access Hatch** allowed maintenance crews and Security Police access to the missile. The reinforced steel and concrete door weighs five tons, and could be opened through a series of combination locks. The door took 45 minutes or more to open. Security Police from the nearest launch control facility would respond to any security breach or sabotage.
- 8 The **Improved Minuteman Physical Security System (IMPSS)** was used to detect motion in and outside the perimeter fence. If security was breached, missileers at the nearest launch control facility would receive an alert and dispatch Security Police to investigate. Security would arrive in minutes, armed with M-16 assault rifles. Although no records exist of saboteurs, sites were breached occasionally by peace protestors, exercising their first amendment rights.

- 9 The **Missile Silo** stretches 80 ft. below ground, is about 25 ft. in diameter, and made of 14-inch-thick reinforced cement walls. The silo is capped by a 90-ton blast door, which would be blown off during a launch by gas charges. The door was retracted only during the installation of a new missile, which were delivered by a transporter-erector vehicle. Encompassing the silo is an equipment room; the lower level contains a motor generator and batteries.



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