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NUCLEAR WAR

Weapons, Scenarios, Simulations



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THEMATIC FOCUS SERIES

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WEAPONS, SCENARIOS, SIMULATIONS

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Introduction

What would really happen today if a nuclear weapon were actually used? This is not a hypothetical question for military-history enthusiasts or apocalyptic obsessives; it is one of the most concrete—and least understood—issues of our time. Yet after the end of the Cold War, the topic has slowly faded from public discourse, treated almost as a relic of the past. In reality, nuclear warheads still exist, they have evolved, and they remain deployed in significant numbers in at least nine countries, often positioned near some of the most unstable geopolitical fault lines on the planet.

This book was created to fill a gap: to give non-specialist readers the essential tools to understand how today's nuclear world actually works, which arsenals and doctrines matter most, what might happen in the event of escalation, and—above all—what it would really mean, in practical terms, if a nuclear device exploded in the heart of a major city in 2025.

To do this, we have chosen a deliberately accessible tone, but one grounded in solid research. Every technical figure, every scenario, every map or simulation comes from open, authoritative, and verifiable sources: institutional databases, academic publications, independent research centers, and tools such as Nukemap and Nuclear War Simulator. No science-fiction speculation, no gratuitous alarmism—just analysis, data, proportions, and effects. Because the first form of disarmament—the most concrete and democratic one—is knowledge.

The book is divided into three parts. Part I provides the historical, technical, and strategic foundation: what nuclear weapons are, how they work, who possesses them, how they were developed, and how their threat has evolved. It offers the essential context needed to understand the subject, without drowning the reader in technical jargon or sterile chronology.

Part II moves into the core of the issue: deterrence, strategic balance, employment doctrines, and the critical vulnerabilities of today's system. It addresses ethical and geopolitical dilemmas, the real risks of escalation, and the human or systemic errors that can transform an incident into a catastrophe.

Part III is the most "concrete"—and perhaps the most unsettling. Here, we present full simulations of nuclear attacks on real cities, using realistic parameters: New York, London, Paris, Rome, Tehran, as well as military targets such as the Aviano and Ghedi air bases. These are not exercises in

imagination; every scenario is based on scientific modeling, with the goal not of frightening the reader but of making visible what is usually pushed aside. Only by looking directly at the consequences can we fully understand the scale of the nuclear threat—and the urgency of addressing it.

This book is not a technical manual for specialists. It is intended for students, teachers, journalists, policymakers, and curious citizens—for anyone who wants to understand without being overwhelmed by technical language, yet still demands rigor and clarity. It does not offer easy solutions or miracle answers. Instead, it is a serious but accessible invitation to think critically, to recognize warning signs, and to remain alert. Because the nuclear threat has never been just a military issue; it is, above all, a civil one.

USING THE QR CODES IN THIS BOOK



Many chapters are accompanied by QR codes that link to:
- interactive maps (Google Maps)
- documentaries and other videos
- additional websites and resources

The main multimedia contents accessible through the QR codes include:

YouTube: documentaries and other video materials.

Google Maps: geographic locations of the places discussed.

Flickr: curated thematic photo collections.

Websites: further insights and supporting materials.

Next to each QR code you will find only the logo of the destination platform, making access quick and intuitive. To use this feature correctly:
1. Open the camera on your smartphone or tablet.
2. Point it at the QR code: a link will automatically appear.
3. If your device does not support native QR scanning, you can use any of the many free apps available from your digital store.

All sources have been carefully selected from official documents, academic journals, strategic studies, and specialized databases, fully listed in the bibliography at the end of the book.

3. United States of America

3.1 Historical Background: The Birth of the American Nuclear Triad

The United States was the first nation in history to develop, test, and use nuclear weapons. The starting point was the Manhattan Project (1942–1945), which in just three years produced the first atomic bombs and led to their use on Hiroshima and Nagasaki in August 1945. From that moment on, the American nuclear arsenal became a central pillar of national defense and deterrence policy, evolving rapidly in both size and complexity.

In the first years after World War II, Washington enjoyed a nuclear monopoly, but in 1949 the Soviet Union successfully conducted its first atomic test, bringing that monopoly to an end. In response, the United States launched an arms race that would last for decades. In 1952, the U.S. tested its first hydrogen bomb, far more powerful than the weapons used against Hiroshima and Nagasaki.

To counter the Soviet threat and ensure an effective response in any possible scenario, the United States gradually built a nuclear system based on three independent components:

- intercontinental ballistic missiles (ICBMs) deployed in land-based silos,
- submarine-launched ballistic missiles (SLBMs),
- strategic bombers capable of delivering nuclear bombs and missiles.

This structure, known as the nuclear triad, was formalized during the Cold War and still represents the core of U.S. strategic capability. The goal was to ensure that at least one leg of the arsenal would survive a surprise attack and be able to carry out a retaliatory strike (second strike capability).

The first genuine U.S. nuclear doctrine, developed in the 1950s, was "massive retaliation": any Soviet aggression would trigger a full-scale nuclear response. It was a simple and brutal concept, but not very credible in the case of limited or regional conflicts.

In the 1960s, the Kennedy administration introduced a more nuanced strategy: "flexible response", which envisioned a range of nuclear options calibrated to the nature and intensity of the threat. The nuclear triad was essential to this approach, providing a flexible mix of delivery systems and deterrent tools.

Over time, control of U.S. nuclear forces was assigned to highly centralized structures. Since 1992, all U.S. strategic nuclear components (ICBMs, SLBMs, and bombers) have been under the authority of U.S. Strategic Command (USSTRATCOM), headquartered at Offutt Air Force Base in Nebraska. USSTRATCOM is responsible for the readiness and coordination of the nuclear system and can relay orders directly from the President—the only person empowered to authorize a nuclear strike—in a matter of minutes, even under extreme conditions.

3.2 ICBMs – Intercontinental Ballistic Missiles

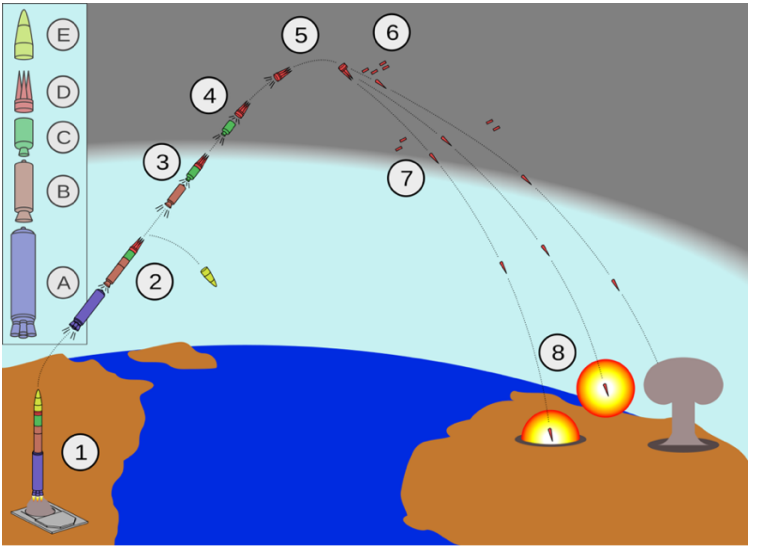
Intercontinental ballistic missiles (ICBMs) are one of the most emblematic and visible elements of U.S. nuclear deterrence. These are land-based nuclear weapons capable of striking targets more than 6,000 miles away (over 10,000 kilometers) in less than 30 minutes, traveling on a suborbital ballistic trajectory.



Today, the only operational ICBM in U.S. service is the LGM-30G Minuteman III, which entered service in 1970. Although it was developed at the height of the Cold War, the Minuteman III has undergone continuous upgrades and modernization, maintaining very high standards of reliability, accuracy, and readiness.

Key data

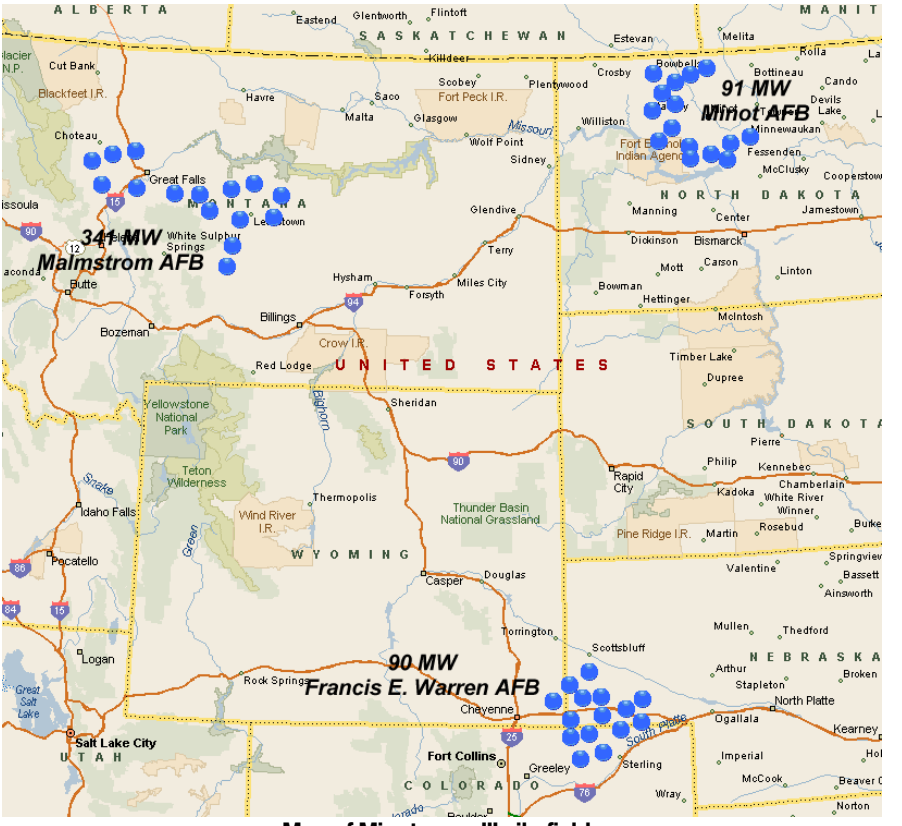
- Number of active missiles: about 400 (limited by START/New START agreements)
- Range: more than 8,000 miles (about 13,000 kilometers)
- Flight time to an intercontinental target: roughly 30 minutes
- MIRV capability (Multiple Independently Targetable Reentry Vehicles): each missile is currently deployed with a single nuclear warhead, in compliance with the New START Treaty. However, the Minuteman III retains the technical capacity to carry multiple MIRVs (up to three warheads per missile).



Launch sequence of a Minuteman III MIRV missile
1. The missile is ejected from the silo by the thrust of the first stage (A).
2. About 60 seconds after launch, the first stage separates and the second-stage motor (B) ignites; the protective shroud (E) is jettisoned.
3. Roughly 120 seconds after launch, the third-stage motor (C) ignites and separates from the second stage.
4. Around 180 seconds after launch, the third stage burns out and the post-boost vehicle or bus (D) separates and coasts along a ballistic path outside the atmosphere.
5. The guided post-boost vehicle maneuvers into the planned deployment trajectory.
6. As it descends along its path, the bus releases the nuclear warheads it carries.
7. Each warhead independently follows its own reentry trajectory toward a pre-programmed target.
8. The warheads detonate either as airbursts or surface bursts over/at their targets.

Deployment and command

Minuteman III missiles are housed in hardened fixed silos spread across hundreds of sites in Montana, North Dakota, and Wyoming. Operational control is divided among three major U.S. Air Force commands (Malmstrom, Minot, and F.E. Warren), which also oversee the launch control centers connected to those silos through secure communication systems. Each silo is linked to a Launch Control Center, manned by officers who can execute a launch order only under a dual-key system and only after following a highly codified procedure. Operational command lies with USSTRATCOM, with ultimate authority reserved to the President.

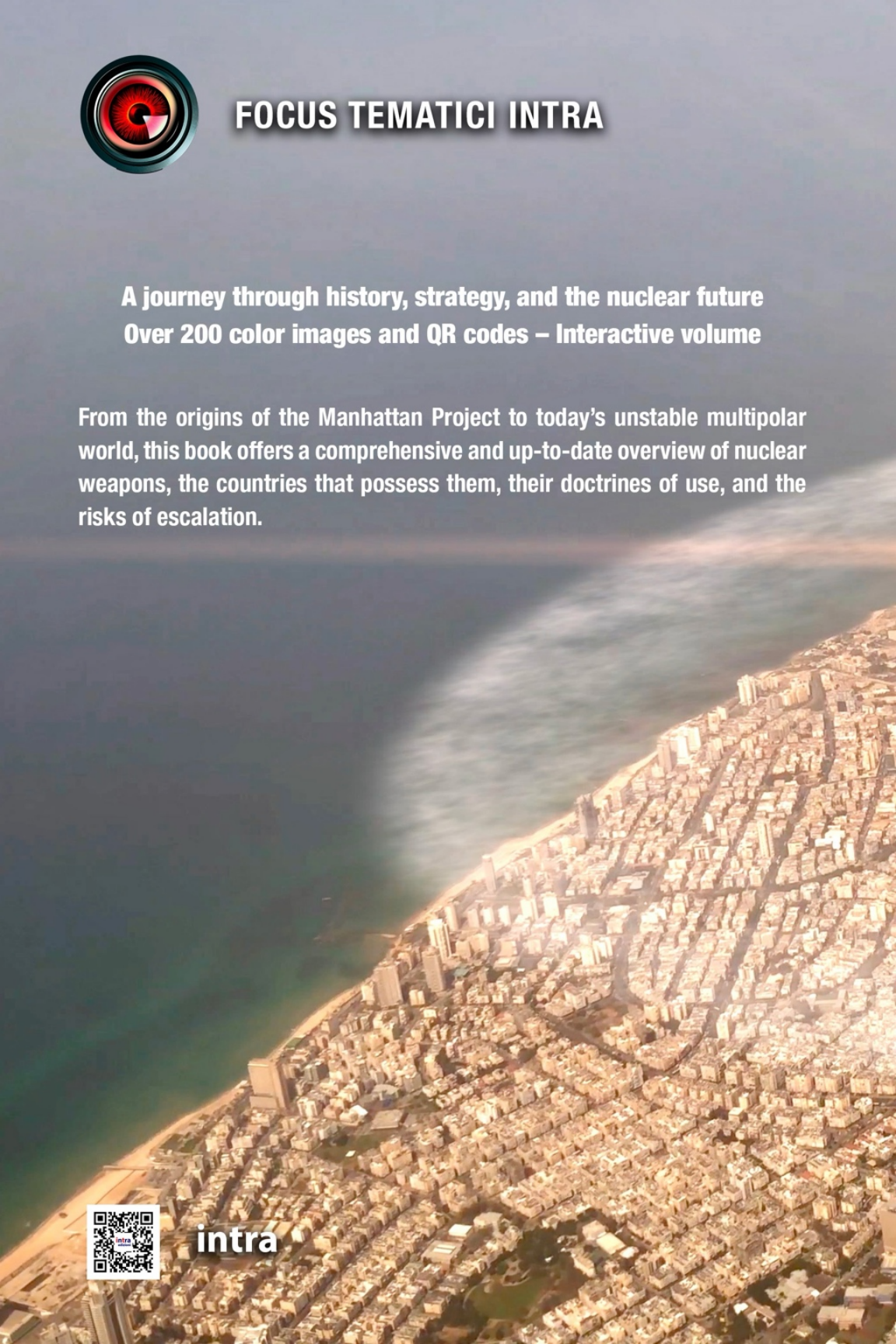


Map of Minuteman III silo fields

F.E. Warren Air Force Base
Cheyenne, WY 82005, USA

Malmstrom Air Force Base
21 77th St N, Malmstrom AFB, MT 59402, USA

Minot Air Force Base
North Dakota, USA


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A journey through history, strategy, and the nuclear future
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From the origins of the Manhattan Project to today's unstable multipolar world, this book offers a comprehensive and up-to-date overview of nuclear weapons, the countries that possess them, their doctrines of use, and the risks of escalation.
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