

The reason we haven't had nuclear disasters isn't careful planning. It's luck.

The alarming role of good fortune in the history of nuclear weapons

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On the morning of Aug. 9, 1945, the city of Nagasaki, Japan, was devastated by a single atomic bomb detonated over it by U.S. military. Nagasaki wasn't the original target for the bomb that morning — that was Kokura, a city to its north, which was spared only because mishaps led the Bockscar airplane to arrive at its target several hours late. When it got there, Kokura was covered in clouds and a smoky haze. Due to Kokura's luck, it was spared — but Nagasaki's luck had run out.

Seventy-five years after the last time a nuclear weapon was used in war, the United States is planning to extend the life of its nuclear arsenal for half a century into the future, with a modernization plan going as far as 2042. Weapons the size of those used in World War II are considered to be “small” and “tactical” weapons today; most warheads in the American arsenal are dozens of times more destructive than the ones dropped on Japan. And the United States is no longer the only power with nuclear weapons, either.

Which makes it all the scarier to realize that luck — the same luck that spared Kokura and doomed Nagasaki — is one of the main reasons we've avoided nuclear catastrophes since then.

The agencies and organizations that manage nuclear stockpiles tend to rely on narratives of total control. They reassure us nuclear weapons have an excellent safety record, nuclear deterrence will prevent nuclear war from happening, and these large expenditures on warheads that could kill millions and millions are not only a good idea, but also *necessary* to preserve a world in which nuclear weapons won't be used.

But the historical counterexamples undermine that message: the near miss nuclear accidents that resulted in nuclear warheads coming close to detonation not only in the United States (such as the Goldsboro accident over North Carolina), but also in foreign territory (like the Palomares accident over Spain); the close-calls where U.S. and Soviet early-warning systems failed and informed their users that a nuclear strike had begun; the moments of brinkmanship that led leaders of both nations to have to make decisions that could lead to the deaths of hundreds of millions of people based on incomplete or false information (such as the Cuban missile crisis). Have we avoided unwanted nuclear explosions, and nuclear war, because we have adequately managed and controlled weapons and crises ... or because we have been lucky?

Luck, in this context, seems to mean the exact opposite of control. It's all that prevented bad outcomes when things could easily have gone in a different direction, no matter what anybody wanted. The historical policymakers who have

invoked “luck” have included Robert S. McNamara, who was defense secretary during the Cuban missile crisis; Dean Acheson, special envoy of President John F. Kennedy at the time; ambassador Gerard C. Smith, chief U.S. delegate to the Strategic Arms Limitation Talks in 1969; former defense secretary William Perry, former secretary of state George Shultz, former national security adviser and secretary of state Henry Kissinger, former chairman of the Senate’s Armed Services Committee, Sam Nunn, and former head of Strategic Air Command and Strategic Command, Gen. George Lee Butler.

Most people know the Cuban missile crisis was considered by those involved to be “lucky” — as McNamara put it, years later, in an interview with Errol Morris: “At the end, we lucked out. It was luck that prevented nuclear war.” But even in more mundane cases, there are clear indications that fortunate outcomes were achieved with no help at all from the nuclear control practices in the U.S. arsenal.

On Jan. 24, 1961, a B-52 bomber broke apart in flight near Goldsboro, N.C., and two atomic bombs fell free, one in a way that caused its arming sequence to be initiated. Only one safety switch remaining in the safe position prevented a bomb more than 250 times more destructive than the one dropped on Hiroshima from exploding. One could, of course, claim the switch had operated as designed, and thus the event was “controlled,” not “lucky.” But as one retired weapon system engineer from Sandia National Laboratories later explained in a government-produced documentary on the incident, “unfortunately, there had been some 30-some incidents where the ready-safe switch was operated inadvertently. We’re fortunate that the weapons involved at Goldsboro were not suffering from the same malady.” The only reason a multi-megaton nuclear explosion did not take place is because, luckily, two failures that had happened separately in the past did not happen simultaneously this time.

Similarly, on the night of Sept. 15, 1980, engine No. 5 of a B-52 at Grand Forks Air Force Base in North Dakota caught fire and, despite the intervention of firefighters, kept burning for more than three hours. Only a strong wind that kept the flames away from the weapons compartment prevented the fire from igniting the high explosives in the plane’s nuclear weapons. Doing so would, at a minimum, have spread a plume of toxic plutonium over a wide area; Roger Batzel, the director of Lawrence Livermore National Laboratory at the time, testified in 1988 that it could have been “worse than Chernobyl.”

Avoiding disaster there hinged on three variables that had nothing to do with control practices: the continued presence of strong winds as long as needed for the fire to stop; the fact the wind did not change direction in those three hours, and the fact the burning plane was parked in just the right location on the tarmac for the wind to put the blaze out. Control practices, obviously, don’t affect wind patterns, and other bombers were parked on all sides of the tarmac.

It may seem strange to study the history of luck — after all, how many people have said they don’t believe in luck in the first place? But luck here isn’t some supernatural property or a quality people have or don’t have: It is about the places and times where *nobody is in control*. That lack of control can have either good or bad outcomes, but the result is out of our hands either way. The strong influence of luck in our nuclear history, from the beginning, is disturbing.

That influence may be even stronger than we realize. Psychological and career incentives among nuclear security professionals can push them to underplay or not disclose cases of luck, or to retrospectively reframe averted disasters as cases of successful control. The late Sandia safety engineer Robert L. Peurifoy spent years battling such cases of overconfidence, where both scientific and military experts effectively denied luck was as important to our continued survival as it appears to have been.

Even in cases that historians have gone over closely, we do not yet and may never have a complete picture of all the ways in which luck played a role. The declassification of records for nuclear close calls remains incomplete and almost nonexistent outside the United States and Britain. We know almost nothing of the role of luck in the histories of other nuclear nations, and the possibility that we need to rely on North Korean luck to avoid a nuclear disaster is alarming.

The world is fortunate to have avoided nuclear war in the 75 years since the bombing of Nagasaki — in more than one sense of the word. That the nuclear bomb dropped on Aug. 9, 1945, was the last one used in conflict has been a matter of chance rather than design. This doesn't mean luck was the only factor, or skilled professionals weren't involved in nuclear control or their efforts did not matter. But the track record is far from perfect in the nations whose nuclear histories we know well, and it's probably not much better in the nations whose nuclear histories we don't. Betting on another half-century with nuclear weapons, but with no new nuclear explosions, is not betting on succeeding twice at a game of control after a first victory. It's betting our luck won't run out in the future — simply because it hasn't run out yet.