Chapter 2
Historical Case Study

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Case studies are useful in analyzing infrequent events because they can assess "close calls" in which such events could have occurred, as well as those instances in which they actually occurred. Nuclear weapons have been used twice, but there have been many more close calls. is chapter

because they are infrequent relative to their opposites (successful medical operations, uneventful ights, etc.). All are also di cult to predict because they can arrr (n)-2.7 (d5)-5.1 [(o .6 (.)41.2 (n)7.9 (e)-11.5 (v)10.4 (e.9 (p)5Tm[(o-1

4. **1954 Vietnam.** French and US o cials discussed the possible use of US nuclear weapons to relieve the siege of French forces at Dien Bien Phu.[14]
5. **1954–1955, 1958 Quemoy-Matsu crises.**

might have considered the use of nuclear weapons, but for which there is no reliable public evidence that they did so. ese might be "negative cases," in which nuclear weapons never received serious consideration, or they could be cases in which nuclear weapons were actually given serious but secret consideration. I analyze each of these ve paths or contexts in turn and provide a list of possible negative cases for each.

Path 1: A nuclear state faces a costly conventional con ict with a non-nuclear state or a conventional con ict in a theater in which it lacks conventional superiority over a nuclear or non-nuclear rival. is path covers the two actual uses of nuclear weapons (Hiroshima, Nagasaki) as well as several instances in which top leaders gave the most serious and detailed consideration to using nuclear weapons: the 1948 Berlin crisis, the Korean War, and the Vietnam War.

Other analogous cases in which a nuclear state may have considered using nuclear weapons by the de nition above, but in which there is no credible public evidence that they did so, include Israel in 1967 (it is unclear whether Israel had by then achieved a usable nuclear weapon), Britain in the Falklands War in 1982, India during its crises with Pakistan in 1987 and 1990 (depending on when one thinks Pakistan attained a usable nuclear weapon), and Israel when it was under attack by Iraqi Scud missiles in 1991.

Path 2: A nuclear state contemplates or carries out a preemptive strike on a rival's small or emerging nuclear weapons capability. A preemptive strike could use a nuclear weapon, or if it is against a state that has a small number of nuclear weapons, it could provoke a nuclear strike. is path includes the US consideration of an attack on China's nuclear facilities in the early 1960s, and the Soviet contemplation of an attack on these facilities in 1969.

ere have been many other cases in which nuclear-armed states considered or carried out attacks on other states' nuclear weapons programs but in which there is no public evidence that they considered using nuclear weapons to carry out such attacks.[24] ese may deserve study to try to classify them as either actual or negative cases of contemplated nuclear weapons use. ese include the Israeli attack on Iraq's Osirak nuclear reactor in 1981; US decision-making on North Korea's nuclear program in 1994; Israeli consideration of attacks on Pakistan's nuclear program in 1983–1987 (Israel sought help from India for possible conventional

of declassi ed Soviet or Russian documents. Presumably there are some unknown Soviet and Russian close calls. e least is known about close calls in other nuclear weapons states with more limited detection and alert systems, and in many instances shorter decision times before an adversary's weapons might strike, including France, Britain, China, North Korea, India, Pakistan, and Israel. e lack of evidence on potential accidental or unauthorized nuclear weapons use by these countries is one of the biggest data gaps in assessing the historical risks of nuclear weapons use.

e known close calls of accidental or unauthorized use embody ve potential paths to nuclear weapons use:

Path 6: False alarms in the absence of an ongoing crisis or war. False alarms in noncrisis contexts are unlikely to lead to nuclear weapons use themselves, but they can indicate the kinds of failure modes that, were they to occur during crises, could be much more dangerous. e cases of such false alarms include the 1961 US Ballistic Missile Early Warning System communication failure,[42] the 1965 US power failure in the Northeast that led to two faulty bomb alarms,[43] the mistaken insertion into US warning systems of a computer tape simulating an incoming nuclear missile attack in 1979,[44] and a 1995 Russian missile warning radar alarm set o by a Norwegian scienti c rocket launch.[45] ese incidents point to the importance of learning about and reducing the failure modes of the early warning systems of new nuclear weapons states that lack the redundant warning systems deployed by the United States.

a series of incidents that could have led to misinterpretations and nuclear weapons use in the Cuban missile crisis.[49]

One incident during the Cuban missile crisis illustrates a potentially important sub-path toward nuclear weapons use in a crisis. During the Cuban crisis, the Soviet Union captured Oleg Penkovsky, a colonel in the Soviet Military Intelligence organization (the GRU) who had been acting as a spy for the United States. Penkovsky had been given a special code to transmit to warn of any impending Soviet nuclear attack on the United States, and a er his capture this code was transmitted (whether by the intention of Penkovsky himself or unwittingly by his captors remains unclear). is incident draws attention to the more general possibility that a state or non-state actor intent on creating a nuclear crisis or even a nuclear war between two of its adversaries might try to create a false alert during a crisis.

Another sub-path involves the deployment of dual-capable weapons systems carrying nuclear weapons to an ongoing con ict or potential con ict zone. Britain's deployment of nuclear-armed ships to the Falklands in 1982 and the US deployment of a nuclear-armed aircra carrier to the Taiwan Strait during a crisis in 1995 illustrate this sub-path. Such deployments might be seen by an adversary as advance preparation for actual nuclear weapons use, or they can lead to unintended escalation if the deployed forces are attacked or captured by an adversary's conventional forces.

Path 8: Close calls of potential use by local commanders without explicit national command authority orders. Because of concerns over possible communication disruptions in a crisis or war, US and Soviet leaders gave

Soviet submarines to the surface. e commander of one such submarine, Valentin Savitsky, believing his submarine was under attack and unsure whether a global war had started, ordered his crew to prepare a nuclear-armed torpedo for launch against the American ships. Fortunately, the second o cer on the Soviet sub, Vasili Arkhipov, whose concurrence was needed for such a decision, convinced commander Savitsky to surface instead and seek orders from Moscow before taking further action.[50] Pry argues that Soviet and later Russian command and control procedures have allowed not only submarine commanders but also nuclear weapons operators at the level of colonel and above to have the technical capability of launching nuclear weapons without rst having to receive an enabling code from national command authorities.[51] More generally, delegation of independent launch authority to local military commanders can create great risks because these commanders may be acting under intense pressure, limited information, and immediate threats to their own lives and those of the soldiers in their units.

In addition, before US nuclear weapons were equipped with authorization codes or managed with dual-key arrangements, it was possible that US military commanders could have used nuclear weapons in crises or combat without explicit presidential authorization. For example, General Curtis LeMay, who headed the US Strategic Air Command, told a member of the Gaither Committee studying US security policy that his plan was to use nuclear weapons preemptively if he received intelligence indicating that Soviet forces were amassing for an attack. When told this contravened US policy, LeMay responded "It's my policy. at's what I'm going to do."[52]

Path 9: Disruption of national command authority chain of command in a civil war or coup. e most dangerous disruption of national command authority of a nuclear-armed state to date was the coup attempt against Soviet General Secretary Gorbachev on August 18–21, 1991. is incident amply demonstrates the dangers inherent in any such violent regime transition in a nuclear weapons state. One of the coup plotters' rst acts was to take the Soviet nuclear "football" from Gorbachev. is device may not be analogous to the American nuclear "football," which is a device with the secret codes necessary to unlock the Permissive Action Links (PAL) or safety devices on all US nuclear weapons other than those on submarines. ere are reports that the Soviet "football" does not contain codes for unlocking Soviet nuclear weapons and only has communications

equipment.[53] In any event, for two days, the coup plotters had some element of control over Soviet nuclear weapons, a worrisome prospect given that these individuals were operating under high stress and on little sleep. One indication of their unbalanced state of mind is that several committed suicide when the coup attempt failed.

A second close call along this path occurred in October 1993, with a split in the Russian government between President Yeltsin and vice president and former general Aleksandr Rutskoy. Forces backing Rutskoy managed to knock out Moscow's main television station, but they failed in their attempt to seize control of the Defense Ministry, and Rutskoy's coup attempt ultimately failed when military forces armed with tanks shelled and took over the parliamentary building in which he was holed up, capturing him and his key supporters.

Path 10: Accidental detonation of a nuclear weapon. US nuclear weapons involve redundant safety devices and procedures and are unlikely to detonate accidentally. Despite thirty-six accidents classi ed as "Broken Arrow" incidents, or accidents involving nuclear weapons, there have been no accidental nuclear detonations.[54] Most of these incidents involved airplane crashes, and several included detonation of the nuclear weapons' conventional explosives. Perhaps the most serious such incident, for present purposes, was the 1968 crash of a nuclear-armed B-52 near the ule Air Base, which detonated the conventional explosives of the nuclear weapons on board. Had it led to a nuclear detonation so close to a US base, it could have triggered a false alarm of a nuclear attack.[55] More worrisome are the nuclear forces of emerging nuclear weapons states, which may lack safeguards as e ective as those on US weapons.

Contexts of Close Calls by Non-State Actors

Nuclear weapons use by non-state actors such as terrorist groups would require three conditions to be jointly met: (1) existence of a terrorist group willing to carry out mass casualty attacks, (2) ability of this group to deliver a nuclear weapon to a target site, and (3) acquisition of a nuclear weapon by this group. As several groups, including not just al-Qaeda but also Lashkar-e-Taiba (a Pakistani group), have demonstrated a willingness to carry out mass-casualty attacks, and as the delivery of a nuclear weapon to a port city by boat is a much easier condition to achieve than acquisition of a nuclear

weapon, this section focuses on the third condition and examines paths through which a terrorist group might acquire a nuclear weapon.

ere have been no known close calls of acquisition of a nuclear weapon by a terrorist group, but some of the steps toward such acquisition have been

Archer exercise—Western leaders were evidently unaware of how seriously Soviet leaders believed that the exercise might be a cover for a planned surprise attack.[61]

Just as it is impossible to make precise estimates of past nuclear risks, these risks cannot be estimated wo0.5 (e)7 ((e)01m0 0 9 54 570 Tc96.3 i)559 (de)2.

on the general intuition that the kinds of risks and pathways to potential nuclear weapons use evident in the cases listed above are indicative of potential future paths to nuclear weapons use, but the frequency and severity of future close calls or the likelihood of future nuclear weapons use is more likely to re ect the risks attendant on new and emerging nuclear powers with small, dispersed arsenals; politically powerful military o cers; and limited warning and safety systems than it is to resemble the US–Soviet nuclear standoff that generated the majority of the historical close calls noted above. A priority for studying past cases is therefore to identify those most similar to the likeliest future risks.

Researchable Questions and Cases in Which They Might Be Studied

Both the literature on the historical close calls above and the wider

case of Iran's nuclear program. Civil–military relations in the 1991 Soviet coup attempt and the 1993 Russian civil con ict might also be relevant to North Korea and Iran, where military organizations play a large political role.

- Are eld commanders more likely than national leaders to favor nuclear weapons use?

  Several of the historical cases noted above, including the 1948 Berlin crisis, the Korean War, the Cuban missile crisis, and the Vietnam War, suggest that military leaders have been more willing to use nuclear weapons than top civilian leaders. Study of these and other cases with a focus on this question can reveal whether this pattern holds up. is has important implications for countries that, to address surprise attacks and potential disruption of communications, devolve the technical capability to use nuclear weapons to top military leaders and especially those that allow weapons operators to have this ability.

- Has there been a trade-o between increasing the diversity and dispersion of nuclear weapons to deter preemption and the need for fewer weapons sites to limit accidental or unauthorized use?

  Anecdotal evidence suggests that US accident rates (particularly Broken Arrow incidents) have become less common as the United States has lowered alert rates of its bomber forces and modernized its nuclear weapons. is might be an actual trend, or it could be an artifact of the reality that more recent events could remain classi ed while older incidents have been declassi ed. In any event, study of the accident rates of states with fewer nuclear weapons (Britain, France, etc.) might provide closer analogies to the likely accident rates of recent and emerging nuclear weapons states.

ongoing trends will a ect which paths from the past are more or less likely

8. James Mahoney and Gary Goertz, “ e Possibility Principle: Choosing Negative Cases in Comparative Research,” *American Political Science Review* 98, no. 4 (2004): 653–669, https://doi.org/10.1017/S0003055404041401.
9. For a revisionist interpretation that the use of atomic bombs against Japan was

Ernest R. May and Philip D. Zelikow, *The Kennedy Tapes: Inside the White House during the Cuban Missile Crisis* (New York: W. W. Norton, 2002).

18. William Burr and Jeffrey T. Richelson, "Whether to "Strangle the Baby in the Cradle": The United States and the Chinese Nuclear Program, 1960–64" *International Security* 25, no. 3 (2000/1): 54–99, https://doi.org/10.1162/016228800560525.
19. Tannenwald, *The Nuclear Taboo*, 221–223.
20. See the collection of documents edited by Robert Wampler at the National Security Archives, "How Do You Solve a Problem Like Korea?," http://www2.gwu.edu/~nsarchiv/NSAEBBty A32.6 4y A6 TcC /P /Lang (en-US)/MCID 1097 BDC BT0.01kxtEEF

2002); and Alan Philips, "20 Mishaps that Might Have Started Nuclear War," Nuclear Age Peace Foundation, Nuclear Files website, http://www.nuclear les.org/menu/key-issues/nuclear-weapons/issues/accidents/20-mishaps-maybe-caused-nuclear-war.htm.

29. Soviet premier Nikolai Bulganin sent a message to President Eisenhower during the Suez crisis noting the risks of potential escalation and referencing the fact that the Soviet Union and the United States both had nuclear weapons. Soviet general secretary Nikita Khrushchev later admitted in his memoirs that this

47. Philips, "20 Mishaps."
48. Pry, *War Scare*.
49. Sagan, *The Limits of Safety*.
50. Mozgovoi, *Cuban Samba*.
51. Pry, *War Scare*.
52. Betts, *Nuclear Blackmail*, 162.
53. Pry, *War Scare*, 149–157.
54. Michael H. Maggelet and James C. Oskins, *Broken Arrow: The Declassified History of U.S. Nuclear Weapons Accidents* (Raleigh, NC: Lulu, 2008).
55. Philips, "20 Mishaps."
56. Graham Allison, *Nuclear Terrorism: The Ultimate Preventable Catastrophe*, 1st ed. (New York: Times Books/Henry Holt and Company, 2004).
57. Allison, *Nuclear Terrorism*; and Peter D. Zimmerman and Jeffrey G. Lewis, "The Bomb in the Backyard," *Foreign Policy*, November–December 2006, 32–39.
58. International Atomic Energy Agency, "Incident and Trafficking Database," http://www-ns.iaea.org/security/itdb.asp.
59. Daniel Byman, *Deadly Connections: States that Sponsor Terrorism* (Cambridge, UK: Cambridge University Press, 2007).
60. Theodore C. Sorensen, *Kennedy* (New York: Harper & Row, 1965), 705. According to Sorenson, "The odds that the Soviets would go all the way to war, he [Kennedy] later said, seemed to him then 'somewhere between one out of three and even.'" Note that Kennedy's estimate refers to the likelihood of war but does not explicitly specify nuclear war. Nevertheless, it seems clear that if the Soviets initiated a conventional war (in Berlin, perhaps), the likelihood of escalation to nuclear conflict was high.
61. Pry, *War Scare*.
62. Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W. W. Norton, 1995); and Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: An Enduring Debate* (New York: W. W. Norton, 2002).
63. Horowitz, "The Spread of Nuclear Weapons."
64. Kyle Beardsley and Victor Asal, "Winning with the Bomb," *Journal of Conflict Resolution* 53, no. 2 (2009): 278–301, https://doi.org/10.1177/0022002708330386.
65. Robert Rauchaus, "Evaluating the Nuclear Peace Hypothesis: A Quantitative Approach," *Journal of Conflict Resolution* 53, no. 2 (2009): 258–277, https://doi.org/10.1177/0022002708330387.
66. Tannenwald, *The Nuclear Taboo*.
67. Paul, *The Tradition of Non-Use*.