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The Finger on the Button: The Authority to Use Nuclear Weapons in Nuclear-Armed States

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Middlebury Institute of
International Studies at Monterey

James Martin Center for Nonproliferation Studies

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Cover image: US Marine Corps Major serving as a military aide at the White House carries the “Nuclear Football.”

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“I can go into my office and pick up the telephone and in 25 minutes,
70 million people will be dead.”

— Richard M. Nixon to a group of Congressmen, November 1973.

“Could a President elect to launch a nuclear war as he lashed out at the personal misfortune of such an impeachment? Or what if another President quietly and suddenly becomes psychotic? [...] Can we achieve tighter control over a President without sacrificing the same important credibilities [*sic*] in deterrence? Can we do so without sacrificing controls over the military? Have we perhaps left the President too uncontrolled in earlier days, in the process of balancing deterrence and the control of the military?”

— George F. Quester, Presidential Authority and Nuclear Weapons, in First Use of Nuclear Weapons, Hearings before the Subcommittee on International Security and Scientific Affairs of the Committee on International Relations, House of Representatives, 94th Congress, Second Session, March 16–25, 1976.

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ACRONYMS AND ABBREVIATIONS

C2	command and control
CDS	chief of defense staff
CINC	commander-in-chief
CJCS	chairman of the Joint Chiefs of Staff
CMC	Central Military Commission
CNS	James Martin Center for Nonproliferation Studies
DG SPD	director general of the Strategic Plans Division
DoD	Department of Defense
EAM	Emergency Action Message
ECC	Employment Control Committee
ECRS	Emergency Rocket Communications System
GOC	Global Operations Center (of STRATCOM)
GUMO	a directorate of the Russian Ministry of Defense
ICBM	intercontinental ballistic missiles
KPA	Korean People's Army
KSBV	Russian centralized command-and-control system
NCA	National Command Authority
NCCS	Nuclear Command and Control System
NMCC	National Military Command Center
NORAD	North American Command
NSA	National Security Agency
NSC	National Security Council
NSC(N)	Nuclear subcommittee of the NSC
PAL	Permissive Action Link
PEOC	Presidential Emergency Operations Center
PES	Positive Enable Systems
PLA	People's Liberation Army
SAS	Sealed Authenticator System
SFC	Strategic Forces Command
SLBM	submarine-launched ballistic missile
SPD	Strategic Planning Division
SSBN	nuclear ballistic-missile-armed submarines
STRATCOM	Strategic Command

INTRODUCTION

The debate about the personality of Donald J. Trump has shed new light on an old question: how much of the terrible responsibility to inflict large-scale nuclear destruction should nuclear-armed countries invest in a single person?

The terms of this debate are well known and relate to the specific requirements of nuclear deterrence. On the one hand, there is a broad desire to retain political control and put in place measures to ensure there is never accidental or unauthorized nuclear use. On the other hand, the credibility of deterrence is thought to rest on the ability to always launch if and when decided, even in demanding cases such as a surprise attack. These twin goals are in tension, a situation that Peter Feaver terms the “always/never” dilemma.¹

Each nuclear-weapon state has struck a slightly different balance between these measures, a balance that differs both among the nuclear-weapon states as well as within those states over time. As three authors put it, based on Feaver’s work, “Nuclear command-and-control systems shift back and forth between delegative and assertive postures depending on the ‘time-urgency quality’ of the nuclear arsenal and (...) the state of civil-military relations and domestic politics more generally.”² A preference to the “always” side of the dilemma (guaranteeing that launch will be executed if ordered) leads a state to adopt control procedures that may be more lenient than when preference is given to the “never” side (guaranteeing that launch will not be executed if not ordered).

A common procedure to manage the always/never dilemma is to require two persons at various links in the chain of command to agree on a step involving nuclear weapons (the “two-man rule”). However, this expression may refer to different mechanisms, which may be:

- The physical requirement for at least two persons to execute any nuclear-related procedure, which may include two simultaneous moves or gestures, or the insertion of two codes (or separate parts of a single code);
- The legally mandated presence, alongside the authority giving the order, of an authenticating, controlling, or verifying authority for any nuclear-related procedure (possibly as a separate chain, with reporting upward along the line);
- The existence of two different chains of command, with separate orders given all along the line, for example, one for launchers and one for warheads.

¹ This was illustrated by the US domestic debates during the first decades of the nuclear age. The first school was embodied by the Strategic Air Command (General Curtis Le May) and the Pentagon, but also by President Dwight D. Eisenhower. The second school was embodied by the Atomic Energy Commission, and later by President John F. Kennedy and his civilian advisers.

² Hans Born, Bates Gill, and Heiner Hänggi, *Governing the Bomb: Civilian Control and Democratic Accountability of Nuclear Weapons* (Oxford: Oxford University Press, 2010).

The concept of “code” generally refers to a short alphanumeric series (two to twelve letters and/or numbers) which can be read or memorized. However, codes may also be more complex signals, communicated only by electronic means. “Authenticating” codes refers to the legitimacy of the order—they certify that the person giving the instruction is legally entitled to do so. “Enabling” codes refers to the ability to unlock missiles and warheads (such as permissive action links, or PALs).³ For most countries, orders would include specific instructions regarding targeting and timing.

While the two-person rule is common throughout the chain of command, several nuclear-armed countries choose to concentrate the legal authority to order the use of nuclear weapons in the hands of a single political leader. It is important to note that authority is not the same thing as ability—in most, if not all, nuclear-armed countries, the legal authority to order the use of nuclear weapons is held at a much higher level than is the actual ability to launch those weapons. Effectively, the two-person rule divides the ability to carry out the action among multiple persons, thus increasing the likelihood that nuclear weapons will only be used on the order of the appropriate authority. The election of Donald Trump has renewed debate over the wisdom of this arrangement.

The issue is not merely about President Trump. Many nuclear-armed states are expanding the number and types of nuclear weapons they possess, introducing systems that alter the requirements for command and control. (Several new countries are deploying or plan to deploy sea-based nuclear capabilities, including India, Pakistan, North Korea, and possibly Israel.)⁴ New developments in technology can improve the security of nuclear command and control (encryption, communications, etc.) while also introducing new vulnerabilities.

Few studies have detailed the procedures that govern the use of nuclear weapons in all nuclear-armed countries in a comparative way. Indeed, since a report to the US House of Representatives in 1975, almost no publications have been devoted to this subject, a rare exception being a short though valuable 2017 Union of Concerned Scientists report.⁵

³ Countries known to have such controls include the United States, Russia, France, and Pakistan.

⁴ India, for instance, commissioned its first domestically built nuclear ballistic-missile-armed submarine, the INS *Arihant*, in 2016. See: Kelsey Davenport, “India’s Submarine Completes Tests,” *Arms Control Today*, April 2016, https://www.armscontrol.org/ACT/2016_04/News/Indias-Submarine-Completes-Tests. North Korea’s *Sinpo* SSB, launched in March 2014, is small, diesel-powered, and lacks an air-independent propulsion system, rendering it unable to remain submerged for more than a few days. In 2017, open-source analysts detected indications of a new shipbuilding program underway. See Joseph S. Bermudez Jr., “Sinpo South Shipyard: SLBM Test Not Imminent; Unknown Shipbuilding Program Underway,” 38North.org, October 11, 2017, <https://www.38north.org/2017/10/sinpo101117/>. In addition, the US Department of Defense predicts that China’s submarine fleet will grow from fifty-six (four SSBNs, five nuclear-powered attack submarines, and forty-seven diesel-powered attack subs) to somewhere between sixty-nine and seventy-eight. See: Office of the Secretary of Defense, “Annual Report to Congress: Military and Security Developments Involving the People’s Republic of China 2018,” May 16, 2018, <https://media.defense.gov/2018/Aug/16/2001955282/-1/-1/1/2018-CHINA-MILITARY-POWER-REPORT.PDF>.

⁵ Congressional Research Service, *Authority to order the use of nuclear weapons: United States, United Kingdom, France, Soviet Union, People’s Republic of China* (Washington, DC: US Government Printing Office, December 1, 1975); Union of Concerned Scientists, “Whose Finger Is on the Button? Nuclear Launch Authority in the United States and Other Nations,” Issue Brief, 2017, <https://www.ucsusa.org/sites/default/files/attach/2017/11/Launch-Authority.pdf>. See also, on a broader theme, Born, Gill, and Hänggi, *Governing the Bomb*.

This CNS Occasional Paper seeks to address sets of questions for each of the nine known nuclear-weapon possessors:

- (1) Who has the legal authority to use nuclear weapons and on what grounds?
- (2) How would the decision to use nuclear weapons be taken and how would that decision, in the form of an order, be transmitted? What are the procedures designed to ensure political control? Have any states predelegated the authority to use nuclear weapons under specified, extreme circumstances?
- (3) What would happen if the legitimate authority were incapacitated (“devolution procedures”)?

UNITED STATES

Employment Authority

The president of the United States has the sole authority to use nuclear weapons by tradition, if not by right.⁶ A report of the Special Committee on Atomic Energy submitted to the National Security Council (NSC) in 1948—NSC-30—was the first text codifying this presidential power.⁷ A 2013 Department of Defense (DoD) report to Congress states that “consistent with decades-long practice, the President, as Commander in Chief of the U.S. Armed Forces, has the sole authority to order the employment of U.S. nuclear forces.”⁸

The National Command Authority (NCA) includes the president and the secretary of defense. The military chain of command goes from the president to the secretary of defense, and from the secretary to combatant commands.⁹ However, there is lingering uncertainty regarding the exact roles of the secretary of defense and the chairman of the Joint Chiefs of Staff for nuclear-weapon use:

- Some sources mention the secretary of defense’s direct involvement, either as a member of the chain of command (the order going through him or her) or as a validating authority (the role being to ensure that the order comes from the president). The acting undersecretary for defense policy testified in 2017 that, “if the order is given, the chain of command runs from the President to the Secretary of Defense to the Commander of U.S. Strategic Command,” thus describing the “normal” chain of command as applicable also to nuclear-weapon use.¹⁰ A 2016 Congressional Research Service fact sheet stated that the secretary of defense “would establish the legality of the order by confirming that it came from the President” (though its updated 2017 version is more vague on this point).¹¹

⁶ See also the detailed expert discussion of this question by Alex Wellerstein, “The President and the Bomb (parts I–III),” *Restricted Data: The Nuclear Secrecy Blog*, November 18, 2016, <http://blog.nuclearsecrecy.com/2016/11/18/the-president-and-the-bomb/>. See also the debate on the constitutionality of the 1973 War Powers Act (Public Law 93-148, 87 Stat. 555), regarding the legality of the *preventive* use of nuclear weapons by the US president without Congressional authorization.

⁷ “The decision as to the employment of atomic weapons in the event of war is to be made by the Chief Executive when he considers such decision to be required.” NSC-30, Conclusions, para. 13, September 1948.

⁸ Department of Defense, “Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.,” June 12, 2013, p. 5.

⁹ US Code, Title 10, § 162. The secretary of defense was included in the chain of command in 1958. Until 1974, the NCA included also the Joint Chiefs of Staff.

¹⁰ Statement of Brian P. McKeon, Hearing on Authority to Order the Use of Nuclear Weapons Committee on Foreign Relations United States Senate, 115th Cong., 1st Sess., November 14, 2017.

¹¹ Congressional Research Service, “Defense Primer: Command and Control of Nuclear Forces,” *In Focus*, December 1, 2016, <https://fas.org/sqp/crs/natsec/IF10521.pdf>. (“The Secretary of Defense would possibly contribute the process by confirming that the order came from the President, but this role could also be filled by an officer in the NMCC [National Military Command Center] at the Pentagon.”) This is consistent with a 1976 testimony by an anonymous

- However, other former officials suggest otherwise. Former Secretary of Defense William Perry says that the order “can go directly” from the president to commanders, that “the defense secretary is not necessarily in that loop,” and that, in any case, s/he “does not have the authority to stop it” (no more than the secretary of defense has authority to stop any order from the president).¹² Former senior officials have repeatedly confirmed the absolute power of the president.¹³ An Air Force Doctrine document specifies that “The President may direct the use of nuclear weapons through an executive order via the Chairman of the Joint Chiefs of Staff.”¹⁴ Expert Bruce Blair concurs: the secretary of defense, “contrary to widespread belief,” has “no particular role” in the process of authorizing nuclear-weapon use and “does not need to confirm the order.”¹⁵ Likewise, author Garrett Graff attests “there’s no second voice, like the defense secretary or chairman of Joint Chiefs, that has to OK a launch.”¹⁶

In most cases, the secretary of defense and the chairman of the Joint Chiefs would be involved in the planning of any military operation that might include the use of nuclear weapons, and hence the controversy discussed above. (To be clear, however, while each may express his or her opinion, neither has a veto.)

Authentication and Transmission of Order

There are two primary objects within the US system: codes to authenticate the president’s order and a secure communication link to the National Military Command Center. “All we carry, of course,” as President Bill Clinton explained to Russian President Boris Yeltsin, “are the codes and the secure phone.”¹⁷

official to the effect that the president could not launch nuclear weapons without “involving” the secretary of defense (quoted in Phil Stanford, “Who Pushes the Button?,” *Parade*, March 28, 1976).

¹² Quoted in Edward-Isaac Dove, “Don’t Count on the Cabinet to Stop a Trump-Ordered Nuclear Strike,” *Politico*, November 14, 2017, <https://www.politico.com/magazine/story/2017/11/14/jim-mattis-rex-tillerson-cabinet-stop-trump-nuclear-weapon-war-215824>.

¹³ For instance: “There’s no veto once the president has ordered a strike [...] The president and only the president has the authority to order the use of nuclear weapons.” (Franklin C. Miller quoted in William J. Broad and David E. Sanger, “Debate Over Trump’s Fitness Raises Issue of Checks on Nuclear Power,” *New York Times*, August 4, 2016, <https://www.nytimes.com/2016/08/05/science/donald-trump-nuclear-codes.html>).

¹⁴ US Air Force Doctrine, Annex 3-72, Nuclear Operations (updated 2015), <https://www.doctrine.af.mil/Doctrine-Annexes/Annex-3-72-Nuclear-Ops/>.

¹⁵ Bruce Blair, “Strengthening Checks on Presidential Nuclear Launch Authority,” *Arms Control Today*, January/February 2018, https://www.armscontrol.org/sites/default/files/files/ACT/ACT_JanFeb18_Blair_Prepublishation.pdf.

¹⁶ Quoted in Chris Cillizza, “The nuclear football is a lot like a Denny’s menu,” *CNN*, August 23, 2017, <https://edition.cnn.com/2017/08/23/politics/nuclear-football-garrett-graff/index.html>.

¹⁷ The White House, “Memorandum Of Conversation, Private Dinner with Russian President Yeltsin: Middle East, China, Iran, Nuclear Control,” Helsinki, Finland, March 21, 1997, <https://nsarchive2.gwu.edu/dc.html?doc=4950568-Document-09-Memorandum-of-Conversation-Private>.

The president reportedly holds a presidential identification card, sometimes colloquially called the “biscuit” or “cookie,” manufactured by the National Security Agency (NSA) by a random code machine. This Sealed Authenticator System (SAS) card is reportedly a 3x5 credit-card shaped object contained inside an opaque film, and includes letter code(s) (“Gold Code”), updated daily.¹⁸ The “biscuit” is held by the president or an aide.

The president also has a team of military aides who carry the President’s Emergency Satchel (or “football,” which the vice president also has, along with his own code card).¹⁹ According to Perry, “the nuclear football travels with the [the president] at all times, usually as close as the next room.”²⁰ The football—contrary to the Russian *Cheget*—is not a communication device, but rather stores strike options—the “Black Book”—from which the president may choose. (There is also a system of secure communications. Traditionally this was a “Secure Telephone Unit,” but in recent years, the demand for smartphones appears to have resulted in the development of new devices.)²¹

The order given, probably by phone, from the Presidential Emergency Operations Center (PEOC) in the basement of the White House or any other location would reach the Joint Chiefs of Staff at the Pentagon (National Military Command Center, NMCC)²² or, failing that, the National Airborne Operations Center, an E-4B aircraft that functions as an alternate NMCC.²³

The order is authenticated, in principle by the NMCC’s deputy director of operations, in the form of a brief exchange with the president (emission of a “challenge code” and response, which some say is “often two phonetic letters from the military alphabet, such as ‘Delta-Echo’.”)²⁴

¹⁸ David Wright, “Trump and the Nuclear Codes: How to Launch a Nuclear Weapon,” Union of Concerned Scientists, January 11, 2017, <https://allthingsnuclear.org/dwright/trump-and-the-nuclear-codes-how-to-launch-a-nuclear-weapon>.

¹⁹ Bruce Blair, *The Logic of Accidental Nuclear War* (Washington, DC: The Brookings Institution Press, 1993), p. 50. Under the Jimmy Carter presidency, only the vice president had his own set of codes.

²⁰ William Perry, @SecDef19, Twitter, September 6, 2018.

²¹ Will Connors, “BlackBerry Suffers Blow as White House Tests Samsung, LG Phones,” *Wall Street Journal*, March 20, 2014, <https://www.wsj.com/articles/blackberry-suffers-blow-as-white-house-begins-testing-samsung-and-lg-phones-1395344496>.

²² The NMCC is “the primary [national command and control] NC2 facility.” Office of the Deputy Assistant Secretary of Defense for Nuclear Matters, *Nuclear Matters Handbook* 2016, https://www.acq.osd.mil/ncbdp/nm/nmhb/chapters/chapter_6.htm.

²³ Another alternate NMCC is Site R. Some pictures of the “football” show a small antenna protruding, but a closer look seems to indicate the presence of a portable communication device stored in a dedicated pocket.

²⁴ Dave Merrill, Mafeesa Syeed, and Brittany Harris, “To Launch a Nuclear Strike, Donald Trump Would Follow These Steps,” Bloomberg, January 20, 2017, <https://www.bloomberg.com/politics/graphics/2016-nuclear-weapon-launch/>.

The order is then converted and formatted into an Emergency Action Message (EAM), a “string of letters and numbers”²⁵ reportedly about 150 characters long.²⁶ The message includes information confirming the legitimacy of the order, specifying the plan decided by the authority, its timing, as well as codes to enable launch and unlock missiles (Positive Enable Systems) and warheads (such as PALs).²⁷

The EAM is transmitted through a dedicated network, which is part of the Nuclear Command and Control System established in 1981. Like the identification codes, the unlocking codes are also contained on sealed cards kept at Strategic Command (STRATCOM) in Omaha, Nebraska, and in the units.²⁸ In principle, the order goes through the STRATCOM Global Operations Center (GOC) or, failing that, through a Boeing E-6B Airborne Command Post, a back-up of the GOC, then to the units.²⁹ There are procedures to ensure that the presidential order reaches the forces in all circumstances: to that effect, in addition to a so-called “thick-line” (rigid) architecture that supports routine communications in peacetime and in war, the nuclear command, control, and communications system also includes an alternative “thin-line” (flexible) architecture designed to operate under the most extreme circumstances.³⁰

At the end of the chain, the order to use nuclear weapons is authenticated by at least two persons reading a Sealed Authenticator System (SAS) card, nicknamed a “cookie,” contained in a safe.³¹ Intercontinental ballistic-missile (ICBM) launch requires the simultaneous turn of keys by four persons, two each at different launch capsules.³² Once the order is authenticated, the captain of a nuclear-armed submarine (SSBN) and his executive officer would open a double safe (requiring that both enter their own combination) containing an SAS card as well as the “fire control” key used to launch the weapons. The launch of submarine-launched ballistic missiles (SLBMs) would involve the participation of four persons: the captain, the navigation officer, the missile officer, and the launch control officer.

²⁵ Thomas Reed, *At the Abyss: An Insider's Story of the Cold War* (New York: Random House, 2005), p. 332.

²⁶ Merrill, Syeed, and Harris, “To Launch a Nuclear Strike, Donald Trump Would Follow These Steps.”

²⁷ “PALs” is used here as a broad category of use-control systems. The US nuclear-armed submarines were the last force to include protection devices that precluded the launch of nuclear weapons without an external coded order (Trident Coded Control Devices were introduced around 1997).

²⁸ See Jeffrey Lewis, “Biscuits, Cookies, and Nuclear Bombs,” *Arms Control Wonk*, October 27, 2010, <https://www.armscontrolwonk.com/archive/203066/biscuits-cookies-and-nuclear-bombs/>.

²⁹ For US nuclear weapons in Europe, the order would probably go through US European Command (EUCOM) as opposed to STRATCOM.

³⁰ Office of the Deputy Assistant Secretary of Defense for Nuclear Matters, *Nuclear Matters Handbook 2016*.

³¹ Stanford, “Who Pushes the Button?”

³² Blair, “Strengthening Checks on Presidential Nuclear Launch Authority.” In some circumstances, one capsule (two officers) can launch up to 50 missiles. See Bruce Blair, “Letter to the Editor,” in Jeffrey Lewis, “Blair on the Ever-Ready Nuclear Missileer,” *Arms Control Wonk*, November 10, 2008, <https://www.armscontrolwonk.com/archive/202088/blair-on-the-ever-ready-misileer/>.

Predelegation of the authority to use nuclear weapons is legal, as the president can delegate his powers in any domain:³³

- From 1957 to 1968 (according to a procedure known as Furtherance), delegation to combatant commanders—and possibly to the next level—existed if time and circumstances did not allow for a presidential decision, or if communication from the president to the military was impossible.³⁴
- From 1965 until the end the Cold War, the North American Air Defense Command (or NORAD, the binational command of the United States and Canada, located in Colorado Springs) had predelegation authority, albeit only “under severe restrictions and specific conditions of attack” on the continent.³⁵ The NORAD commander had to repeatedly try to contact civilian authorities, and could only use low-yield defensive weapons on US/Canadian territory or waters. This authority was terminated in 1992.³⁶

Devolution Procedures

The order of presidential succession, fixed by a 1947 act, is: vice president, speaker of the House of Representatives, the president *pro tempore* of the Senate, then secretaries and heads of government agencies in the order of protocol (except in cases of birth abroad, which prohibits presidential eligibility).³⁷

According to the 25th Amendment of 1965, which codified existing practice, the vice president could temporarily become—if the president were unable to serve—“acting president,” with full presidential powers.³⁸ The order of succession of the secretary of defense (the principle of which was established in 1959) is fixed by presidential decree.³⁹ It generally includes the deputy secretary as the first successor

³³ US Code, Title 3, Section 301.

³⁴ National Security Archive, “First Declassification of Eisenhower’s Instructions to Commanders Predelegating Nuclear Weapons Use, 1959-1960,” <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB45/> and “US Had Plans for ‘Full Nuclear Response In Event President Killed or Disappeared during an Attack on the United States,’” December 12, 2012, <https://nsarchive2.gwu.edu/nukevault/ebb406/>; and Daniel Ellsberg, *The Doomsday Machine: Confessions of a Nuclear Planner* (New York, Bloomsbury Publishing, 2017), especially Chapter 3.

³⁵ Vice Admiral Gerald E. Miller, “First Use of Nuclear Weapons: Preserving Responsible Control,” Hearings before the Subcommittee on International Security and Scientific Affairs of the Committee on International Relations, House of Representatives, 94th Cong., 2nd Sess., March 15–16, 1976, p. 55, http://blog.nuclearsecrecy.com/wp-content/uploads/2017/04/hrq-1976-hir-0038_from_1_to_251.pdf.

³⁶ See Blair, *The Logic of Accidental Nuclear War*, p. 50.

³⁷ Changes include the exclusion of the postmaster general (no longer a member of the Cabinet since 1971) and the inclusion of the homeland security secretary (2006). The existence of a “bumping” provision by which a “prior entitled individual” would claim the presidency if available has been debated. See, for instance, Brad Sherman, “Serious Flaws Exist in Our Presidential Succession Laws,” *Roll Call*, January 31, 2011, <https://sherman.house.gov/media-center/opinion-editorials/serious-flaws-exist-in-our-presidential-succession-laws>.

³⁸ This has happened three times, for a few hours, when a president was undergoing surgery (1985, 2002, and 2007).

³⁹ Currently (since 2010): assistant secretary of defense, then secretary of the army, etc.

followed by the secretaries of the armed forces. In case of devolution of power, the term “president” in official texts is deemed to apply to any legal successor.⁴⁰

In circumstances where all the leadership is present in the same place (e.g., inauguration, or the State of the Union Address), and in order to prevent a decapitation scenario, since 1980 one of the authorities (“designated survivor,” a senior cabinet member) of the succession chain is kept absent and ready to assume, if necessary, presidential powers.⁴¹ More recently, such “survivors” have also been appointed for Congress.⁴²

⁴⁰ “‘President’ as used in this directive, includes an official who succeeds to the Office of the Presidency under the Constitution and under 3 U.S.C. 19, as well.” National Security Decision Directive (NSDD) 281, United States Nuclear Weapons Command and Control, August 21, 1987, p. 2.

⁴¹ Or “designated successor.”

⁴² Emily Schultheis, “Joint Session 2017: The History of the ‘Designated Survivor’,” *CBS News*, February 24, 2017, <https://www.cbsnews.com/news/joint-session-2017-the-history-of-the-designated-survivor/>.

RUSSIA

Employment Authority

According to the Constitution (Article 87.1), the president of the Russian Federation is the head of the armed forces. Current military doctrine (2014) specifies that “the decision to use nuclear weapons shall be taken by the President of the Russian Federation.”⁴³

Authentication and Transmission of Order

The authorization to use nuclear weapons (“permission command”) is jointly (“together”) prepared by the president, defense minister, and chief of the General Staff.⁴⁴

The order can be issued two different ways.⁴⁵

Kazbek

The order could be transmitted from one or other of the “briefcases” (*Cheget*) reportedly in the possession of the president, the minister of defense, and (probably) the chief of the defense staff, via the *Kazbek* network.⁴⁶

Kazbek became fully operational in 1985. It supports *Kavkaz*, a dedicated system of communications between senior government officials designed to operate under the conditions of a surprise attack.

The *Chegets* also entered service in 1985. These communication devices were conceived as a means of guaranteeing the execution of the launch order (“always”). They are neither necessary nor sufficient to launch nuclear forces.⁴⁷

⁴³ The Military Doctrine of the Russian Federation, December 25, 2014, para. 27.

⁴⁴ “The president, minister of defense and chief of the General Staff together prepare the authorization for use of nuclear weapons.” Valery E. Yarynich, *C3: Nuclear Command, Control, Cooperation* (Washington, DC: Center for Defense Information, 2003), p. 153.

⁴⁵ Presumably, the order could be launched from the presidential aircraft, the modified Tupolev-214, in operation since 2008.

⁴⁶ Yarynich does not mention the possession of a *Cheget* by the chief of the General Staff.

⁴⁷ See Peter Vincent Pry, *War Scare: Russia and America on the Nuclear Brink* (Westport, CT: Praeger Publishers, 1999), pp. 85, 150–53.

The “direct command” (launch order) would be sent, via the *Chegets*, to the units by the General Staff, which holds the codes. At least until the early 1990s, the General Staff and the commanders had to send two different codes to all three branches as an extra layer of authentication.⁴⁸

Launch orders would be transmitted by second-level communication systems (distinct from *Kazbek*): *Signal* for Strategic Rocket Forces, and KSBU (which stands for centralized command-and-control system) for air and sea forces.⁴⁹

Three questions remain open:

- What are the exact roles of the defense minister and chief of the General Staff? According to Bruce Blair, until 1991, the permission command was intended to be formed “jointly” by the three leaders.⁵⁰ However, he also specifies that the president and the defense minister had to send two separate codes, to be integrated by the chief of the General Staff, who added his or her own code. Valery Yarynich, the author of a reference text on Russian command and control, states that they prepare the authorization “together” (see above); but he also situates the president and defense minister on par as if they would constitute a form of “national command authority” as in the United States, an inheritance of the Soviet Supreme High Command. (He also remains non-committal about the possession of a *Cheget* by the chief of the General Staff.) If these procedures are still correct, it thus possible that the defense minister acts as a validating political authority (but without whom use would be impossible), and that the chief of the General Staff acts as a validating military authority, without whom use would also be impossible.
- Is the prime minister totally outside the decision-making loop in all circumstances? When, for instance, Dmitry Medvedev held the presidency during 2008–12, and Vladimir Putin was prime minister, was Medvedev authorized to use nuclear weapons without Putin’s approval?
- Does the transfer of warheads (for land and air forces) by the 12th GUMO (the main directorate of the Ministry of Defense) to launch units include a separate chain of command (i.e. requiring distinct orders to release warheads to the forces, for security reasons), or is the transfer order part of the launch authorization?⁵¹

Perimetr

Either the Kremlin or the General Staff can activate *Perimetr*, the Russian system of last resort if— and only if—(i) the system is activated, (ii) there have been confirmed detonations on Russian territory,

⁴⁸ Blair aptly summarizes this by stating “the president and the defense minister had the *right* to use nuclear weapons; the CGS [chief of the General Staff] and the relevant CINCs [Commanders in Chief] together had the *ability* to use them.” Blair, *The Logic of Accidental Nuclear War*, p. 86.

⁴⁹ See Yarynich, C3.

⁵⁰ Blair, *The Logic of Accidental Nuclear War*, p. 72.

⁵¹ The 12th GUMO is a special unit of armed forces in charge of handling nuclear weapons. It is directly subordinated to the defense minister.

and (iii) and all contact has been lost with the political and military authorities. The order can be given by the officers via emergency communication rockets which would then be launched.⁵² This system is technically comparable to the US Emergency Rocket Communications System, which was deactivated in 1991.

A two-person rule exists throughout the chain of command. For instance, a launch requires simultaneous actions by two officers on duty.⁵³ It is reasonable to believe that the Russian system has inherited a lot from the Soviet culture of strict controls, which included the absence of any predelegation other than in the framework of the *Perimetr* system.

Devolution Procedures

The Constitution provides (Article 92.3) that “in all cases when the President of the Russian Federation is incapable of fulfilling his duties, they shall temporarily fulfilled by the Chairman of the Government of the Russian Federation” (i.e., the prime minister), who would become “acting president.” The rest of the article implicitly suggests (to the extent that it explicitly excludes some powers) that these transferred powers include the use of nuclear forces.

The possession of a *Cheget* by the defense minister suggests that he or she might be an emergency devolution authority.

There are no official sources on presidential succession in case the prime minister is unavailable, although some have referred to the chair of the Federation Council.⁵⁴

⁵² See Yarynich, C3, as well as David E. Hoffman, *The Dead Hand: The Untold Story of the Cold War and Its Dangerous Legacy* (New York: Doubleday, 2009), pp. 152–54. *Perimetr* should not be confused with the fully automated “Dead Hand” mechanism, a concept imagined in the 1980s that was never implemented.

⁵³ Yarynich, C3, p. 206.

⁵⁴ At the time of the Soviet Union, devolution was to a Politburo member, and then, in the final years, to the vice president, then the chairman of the Supreme Soviet (Blair, *The Logic of Accidental Nuclear War*, p. 64).

UNITED KINGDOM

Employment Authority

UK official texts specify that “only the Prime Minister can authorize the use of nuclear weapons.”⁵⁵

Since the monarch is the head of the armed forces—as well as the head of state—it raises the question whether the prime minister, time and circumstances permitting, would decide to informally consult the monarch, even though s/he is under no obligation to do so.

The UK tradition of collective cabinet decision making suggests that the decision would preferably be collegial. Indeed, during the Cold War, use was reportedly “a collective senior ministerial decision,” although the prime minister would have had “sole authority to act on behalf of the Government.”⁵⁶ The decision could be taken at a meeting of the NSC established in 2010, perhaps in its “nuclear” configuration or NSC(N) subcommittee, which includes seven ministerial members, or in an *ad hoc* “War Cabinet.”

Nonetheless, the best-informed experts are adamant that “only the Prime Minister can activate the codes that” would lead to a nuclear strike and that such an ability is “a purely prime ministerial function.”⁵⁷

Authentication and Transmission of Order

The order could be given from a room located in the Pindar complex underneath Whitehall (specifically from its Nuclear Operations Targeting Center), or to it from any other location with adequate means of communication and cryptography and the availability of two senior nuclear-authentication Cabinet Office staff, a military and a civilian.⁵⁸ This presumably includes the modified Airbus A330 that is used by the prime minister since 2015.

⁵⁵ HM Government, “National Security Strategy and Strategic and Defence Security Review 2015: A Secure and Prosperous United Kingdom,” 2015, para. 4.68, p. 34, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf.

⁵⁶ Kristan Stoddart, *Facing Down the Soviet Union: Britain, the USA, NATO and Nuclear Weapons, 1976–1983* (London: Palgrave MacMillan, 2014), p. 240.

⁵⁷ Peter Hennessy, *The Prime Minister: The Office and Its Holders since 1945* (New York: Palgrave, 2001), p. 90. Prime Minister Macmillan refers in secret correspondence (1961) to nuclear retaliation “on behalf of the government” and of a decision that should be taken “by Ministers, or the Prime Minister on behalf of the Government.” Quoted in Peter Hennessy, *The Secret State: Preparing for the Worst 1945–2010*, 2nd ed. (London: Penguin Books, 2010) pp. 278–79.

⁵⁸ Peter Hennessy and James Jinks, “Cameron’s doomsday machine,” *Sunday Times*, October 11, 2015, <https://www.thetimes.co.uk/article/camérons-doomsday-machine-6wj0b66m3pg>. An earlier work also mentioned the necessary assistance of “a civil servant and a military officer.” See Lawrence Freedman, *Britain and Nuclear Weapons* (London: Macmillan Press, 1980), p. xiii.

An informed historian has surmised that the prime minister cannot issue the “National Firing Directive” unless the chief of defense staff (CDS) “concurs and places his codes alongside those of the Prime Minister,” but this appears incorrect.⁵⁹

The directive is transmitted to the Combined Task Force 345 Operations Room in Northwood and is authenticated by two officers with combinations of letters and numbers.⁶⁰ It is then coded, authenticated again (though not decoded) by two persons at each stage down the command chain. Onboard the SSBN (the United Kingdom only has sea-launched nuclear weapons), the executive officer and the weapons systems officer receive and authenticate the “National Fire Control Message.” The captain and the executive officer open the safe and retrieve the codes and the firing trigger.⁶¹

Official UK statements specify that “the number of participants required to act in concert means that the ‘Permissive Action Link’ type safeguards found in other systems are not relevant to the SSBN domain.”⁶²

Since 1972, four so-called Letters of Last Resort (one per SSBN commander) have been drafted by each prime minister. Options proposed to the prime minister in the past have included: commit the forces; do not commit the forces; make the most reasonable choice; place yourself under Allied command.⁶³

During the Cold War, predelegation procedures were in place: if a nuclear attack had taken place and political authority could not be obtained (that is, if even the second or third nuclear deputy appointed by the prime minister—as described below—were unreachable), the Royal Air Force Strike Command had a standing delegated authority to retaliate.⁶⁴

Devolution Procedures

There is no line of succession in the constitutional sense of the term in the United Kingdom. The position of deputy prime minister, when given concrete form (which may happen in case of a government coalition, as was the case between 2010 and 2015), is purely political.

⁵⁹ Hennessy, *The Secret State*, p. 342, pp. 357–58. Likewise, British expert Shaun Gregory “presumed” that the CDS’s assistance was needed for the prime minister to give the order. See Shaun Gregory, *Nuclear Command and Control in NATO* (London: Macmillan Press, 1996), p. 106). However, key former officials (author’s source, 2018) vigorously dispute this assertion.

⁶⁰ BBC Radio 4, “The Human Button,” December 4, 2008, <https://www.youtube.com/watch?v=hc1L6dCjhwQ>.

⁶¹ See Hennessy, *The Secret State*, pp. 343–44.

⁶² UK Ministry of Defense, “Nuclear Weapons Security – MoD statement,” November 15, 2007, as reported on “Newsnight,” BBC, <http://news.bbc.co.uk/2/hi/programmes/newsnight/7097121.stm>.

⁶³ See Hennessy, *The Secret State*.

⁶⁴ Sir Robert Armstrong, Cabinet Secretary, “Nuclear Release Procedures and Related Matters, June 1983,” document quoted in Stoddart, *Facing Down the Soviet Union*, p. 240.

A member of the House of Commons introduced a bill to establish a line of succession, still under consideration. As presented by its author (no draft text is publicly available yet), the order of succession would be the deputy prime minister, home secretary, defense secretary, etc.⁶⁵

The prime minister may personally appoint up to three nuclear deputies within the government, whose identity remains secret and to whom the authority to commit nuclear forces would be vested, in a predetermined order. Cold War deputies (generally two) included foreign, defense, and home secretaries.⁶⁶ This procedure, which was suspended after the end of the Cold War, was reinstated in 2001.

⁶⁵ See Prime Minister (Temporary Replacement) Bill 2017–19, presented by Parliament on September 5, 2017, <https://services.parliament.uk/bills/2017-19/primeministertemporaryreplacement.html>. As of this writing (January 2019), a date for a second reading (examination) of the draft bill has yet to be announced.

⁶⁶ See Hennessy, *The Secret State*.

FRANCE

Employment Authority

According to Article 15 of the Constitution, “The President of the Republic is the head of the armed forces. He chairs the national defense councils and higher committees.”⁶⁷ It is in this capacity that s/he may order the use of nuclear weapons, although this legitimacy was reinforced with the 1962 decision to elect the president by popular—and not parliamentary—vote.⁶⁸ The power to use nuclear weapons is only mentioned explicitly in the Defense Code, which states in its 2009 revision that “the chief of defense staff is charged with the execution of operations that are necessary for the commitment of nuclear forces. [S/]he ensures that the order of engagement given by the President of the Republic is executed.”⁶⁹

The decision to use nuclear weapons could conceivably be taken in a meeting of the Nuclear Weapons Council, a specialized and more restricted formation of the Defense Council. However, there is no formal requirement for the president to consult anyone before taking the decision.

A dedicated command room—the recently modernized “Jupiter Command Post,” located under the Elysée Palace—could be used to that effect. “Jupiter” also refers to the name of a dedicated communication network (not unlike the Russian *Kazbek* network) between senior political and military authorities.

Regarding the code, testimonies refer to an “object,” which might be a card analogous to the one existing in the US system. Until at least the 1980s, the code was written on a small card which the president carried at all times.⁷⁰ Today, the object may either be in the possession of the president or in the presidential satchel carried by a military aide. Like its US counterpart, the satchel is not a communication device. Its contents are unknown but testimonies tend to downplay its importance for nuclear-weapon employment.⁷¹

⁶⁷ Conseil constitutionnel, *Texte intégral de la Constitution du 4 octobre 1958 en vigueur*, updated July 23, 2008 (author's translation), <https://www.conseil-constitutionnel.fr/le-bloc-de-constitutionnalite/texte-integral-de-la-constitution-du-4-octobre-1958-en-vigueur>.

⁶⁸ The proposition to have the president directly elected by the people (and not by Parliament) partly stems from the power to use nuclear weapons. See Jean Guisnel and Bruno Tertrais, *Le Président et la Bombe* (Paris: Jupiter à l'Elysée, Editions Odile Jacob), 2016.

⁶⁹ *Code de la défense*, Article R*1411-5 (author's translation), <https://www.legifrance.gouv.fr/affichCode.do?idSectionTA=LEGISCTA000021047922&cidTexte=LEGITEXT000006071307&dateTexte=20170811>.

⁷⁰ At that time (late 1960s), the presidential authorization code was a series of six numbers.

⁷¹ Guisnel and Tertrais, *Le Président et la Bombe*, Chapter 18.

Authentication and Transmission or Order

Key testimonies have suggested that the head of the personal military office (*état-major particulier*) of the president, a five-star general, would authenticate the president's order by entering his own code.⁷² Once this authentication has taken place, it is relayed to the armed forces under the responsibility of the CDS. The order is supposed to go directly to the forces, but the CDS ensures that the executed order is the one that has been given by the president.

The order would be transmitted by the RETIAIRE system, supported by the all-purpose RAMSES network, which entered service in 1988, then as necessary by dedicated air force and navy transmission networks.⁷³ A “last resort” communications network, based on separate communication assets and called SYDEREC (*système de dernier recours*), exists. It is based on antennas supported by inflatable balloons, carried by mobile vehicles that would be dispersed on French territory. It would be made available in an emergency in case RETIAIRE were no longer operative.⁷⁴

A set of procedures known as “government control,” placed under the responsibility of the prime minister, ensures political control at all times. The nuclear-weapons inspector (a general officer with nuclear-weapon experience), who reports directly to the president, is in charge of ensuring that the governmental control procedures function properly. It includes, in particular, the “control of commitment”—which ensures that the order can be given at any time and only by a legitimate authority—and the “control of conformity of use”—which ensures that the president's order is strictly executed. Any decision to use nuclear weapons is thus verified by a “security chain,” which is separate from the “implementation chain.” In most cases, the security chain involves a dedicated unit of the *Gendarmerie nationale*, which reports to the defense minister's personal office.⁷⁵

A two-man rule thus operates all along the way, including on board bombers (pilot and navigation officer) and SSBNs (captain and executive officer), where verification procedures are said to be broadly analogous to those in the United States or United Kingdom.

Devolution Procedures

According to the Constitution, the president of the Senate is the temporary successor to the president of the republic until a new election takes place (in less than 35 days unless the Constitutional Council declares a *force majeure*).⁷⁶ S/he would assume full defense powers, including the authority to order a

⁷² Ibid., Chapters 18 and 19.

⁷³ RAMSES: *Réseau Amont Maillé Stratégique et de Survie*. RETIAIRE: *Réseau Interarmées de Transmission d'Infrastructure*.

⁷⁴ SYDEREC : *Système de Dernier Recours*.

⁷⁵ GSAN: *Gendarmerie de sécurité des armes nucléaires*.

⁷⁶ Translated literally as “greater force,” a *force majeure* is declared in the event of an unpredicted national emergency—such as war—or what is legally referred to in the United States “an act of God,” such as a hurricane, flood, or earthquake), temporarily relieving the government of otherwise regular processes and procedures.

nuclear strike. If the president of the Senate is unavailable, the government collectively exercises the president's functions.

In case of an emergency, nuclear devolution procedures exist but are secret. In the 1960s, the succession was public information: after the president came the prime minister, followed by the defense minister. Today, it is widely understood that this devolution authority succession remains, though experts are less unanimous in their confidence that the defense minister remains third in line. The Defense Code, for instance, diverges from this succession: should the Offices of the President, the President of the Senate, and the Prime Minister become simultaneously vacant, “the responsibilities and powers of defense are automatically and successively transmitted to the defense minister and, failing that, to the other ministers in the order indicated in the decree that mentions the composition of the government.”⁷⁷ Thus the succession order below the level of defense minister varies. Finally, it has been reported that each president may appoint a “last resort” authority on his own behalf. The identity of such personalities, if and when they exist, is a closely guarded secret. No details are available on how and on which exact circumstances such arrangements would apply.⁷⁸

⁷⁷ *Code de la défense*, article L-1111-4 (author's translation).
https://www.legifrance.gouv.fr/affichCode.do;jsessionid=3CE81363F934D7503BE5840F08455376.tplgr35s_2?idSectionTA=LEGISCTA000006166887&cidTexte=LEGITEXT000006071307&dateTexte=20190202

⁷⁸ Guisnel and Tertrais, *Le Président et la Bombe*, Chapter 19. ch

CHINA

Employment Authority

China's paramount leader typically holds three offices: the presidency of the People's Republic of China, the secretary-general of the Communist Party of China, and the chairman of the Central Military Commission (CMC). Succession in China occurs from one leader to the next, with the new leader gradually acquiring each of these positions.⁷⁹

Chinese nuclear forces are under the control of the CMC, which "directs the armed forces of the country."⁸⁰ Since 2000, official Chinese texts have referred explicitly to the CMC as the authority for nuclear-weapons orders. Defense white papers state that it is under the "direct command" of the CMC.⁸¹ (There are, in fact, two central military commissions: that of the Communist Party and that of the state, although membership in both institutions usually identical.)⁸²

Over the years, the CMC has changed in size and composition. The current CMC, selected in October 2017, is a seven-member body that includes the minister of defense and the chief of staff, and ensures representation from each of the major services (the People's Liberation Army [PLA] Ground Force, Navy, Air Force, and Rocket Force). Xi Jinping is the only civilian member of the CMC, which probably means that the decision will be his alone. But it is also possible that the country's highest political authority, the Standing Committee of the Politburo (which Xi also chairs), would at least be consulted, if only formally, with time and circumstances permitting.⁸³

Authentication and Transmission of Order

Until recently, China's nuclear forces exclusively comprised land-based ballistic missiles, with other forces existing only as emergency options. For land-based ballistic missiles, as Kenneth W. Allen and Jana Allen have noted, "The chain of command runs from the CMC down through the General Staff

⁷⁹ Chinese leaders traditionally take up their functions as president of the party a few months before those of chairman of the military. See, for example, how this played out in 2002, discussed in footnote 82.

⁸⁰ Constitution of the People's Republic of China, Section 4, Article 93.

⁸¹ Information Office of the State Council, "China's National Defense in 2006," December 2006; Information Office of the State Council, "The Diversified Employment of China's Armed Forces," April 2013. Also: "If China comes under a nuclear threat, the nuclear missile force will act upon the orders of the CMC, go into a higher level of readiness, and get ready for a nuclear counterattack to deter the enemy from using nuclear weapons against China." Information Office of the State Council, "The Diversified Employment of China's Armed Forces."

⁸² Over the course of 2002–05, Jiang Zemin gradually ceded authority to Hu Jintao, relinquishing his positions of general secretary of the Communist Party of China (November 2002), president (March 2003), chairman of the party Central Military Commission (September 2004) and chairman of the State Central Military Commission (March 2005). There can thus be a temporary disjunction among these formations.

⁸³ According to Ta-chen Cheng, the Standing Committee is supposed to approve, in principle, the use of nuclear weapons. See Ta-chen Cheng, "China's Nuclear Command, Control and Operations," *International Relations of the Asia-Pacific*, Vol. 7, No. 2, 2007, <https://academic.oup.com/irap/article-abstract/7/2/155/656915>.

Department to the [Rocket] Force Headquarters to missile bases to missile brigades and missile launch battalions.”⁸⁴

That chain of command would likely be contracted in a contingency. In the 1990s, the United States assessed that the General Staff Department would control communication between the CMC and missile units. (Rocket Force command staff would be collocated with the General Staff Department in this contingency, rather than using the command center beneath the Rocket Force headquarters.) According to John Lewis and Xue Litai,

the General Staff Operations Department plays a critical role in the communications chain from the CMC to the base headquarters. [...] The centre has devised special codes for preventing unauthorized or accidental launches and multistep procedures to transmit and verify orders. A launch will automatically be aborted if any step violates the verification requirements, and several steps depend on the coordinated action of at least two authorized officers.⁸⁵

Moreover, the Rocket Force “regularly practices a concept known as ‘skip echelon’ which allows higher echelon units to bypass subordinate units and give orders directly to the lowest echelon units.”⁸⁶ In practice, this means that the General Staff, on behalf of the CMC, would bypass Rocket Force bases and communicate directly with the launch units.

The warheads may be maintained under a separate but parallel command-and-control system, as asserted by Gregory Kulacki. He claims that the missiles and warheads are “under different commands” and that “the ‘highest command authority’ sends separate commands to each one.”⁸⁷ (Note that the Rocket Force has a separate organization for the management of warheads.)

The advent of ballistic-missile submarines in a highly centralized country such as China raises additional questions about how the CMC will exercise control, particularly if Chinese submarines undertake deterrent patrols. To date, China has maintained a physical separation of warheads and missiles, something that is not possible for patrol missions. There are a number of possible models for SSBN operations, although there is little consensus about control procedures. David Logan identifies three potential models:⁸⁸

⁸⁴ Kenneth W. Allen and Jana Allen, *Building a Strong Informatized Strategic Missile Force: An Overview of the Second Artillery Force with a Focus on Training in 2014* (Washington, DC: The Jamestown Foundation, 2015), p. 6.

⁸⁵ John Wilson Lewis and Xue Litai, *Imagined Enemies: China Prepares for Uncertain War* (Stanford, CT: Stanford University Press, 2008), pp. 198–99.

⁸⁶ David Logan, “PLA Reforms and China’s Nuclear Forces,” *Joint Force Quarterly*, Vol. 83, No. 4 (October 2016), <https://ndupress.ndu.edu/JFQ/Joint-Force-Quarterly-83/Article/969665/pla-reforms-and-chinas-nuclear-forces/>.

⁸⁷ Quoted in Union of Concerned Scientists, “Whose Finger Is on the Button?” p. 4.

⁸⁸ David C. Logan, “China’s Future SSBN Command and Control Structure,” *Strategic Forum*, No. 299, INSS, November 2016, <https://ndupress.ndu.edu/Media/News/Article/1013472/chinas-future-ssbn-command-and-control-structure/>.

- The most straightforward model would be for the PLA Navy to maintain operational control over both SSBNs and their associated missiles.
- An alternative is for the PLA Rocket Force to assume operational control of China's sea-based nuclear weapons and the SSBNs that carry them. Although this would seem to be an unusual arrangement, at least one Chinese commentator has stated he believes such an outcome is "just a matter of time."⁸⁹
- The third model is a hybrid arrangement in which the Navy has operational control of the SSBNs themselves, but the Rocket Force retains control of the SLBMs and nuclear warheads.

These structures are likely to shape China's choices about communications systems. As the Department of Defense notes in its 2018 report on China's military power, "Additionally, the PLA will likely continue deploying more sophisticated C2 [command-and-control] systems and refining C2 processes as growing numbers of mobile ICBMs and future SSBN deterrence patrols require the PLA to safeguard the integrity of nuclear release authority for a larger, more dispersed force."⁹⁰

Devolution Procedures

No devolution procedures are known. China's leadership is defined by the simultaneous holding of three separate offices, each of which have different individuals serving as second-in-command. There is a protocol order: Li Keqiang ranks second, but he is not a member of the CMC. And the vice chairmen of the CMC, Xu Qiliang and Zhang Youxia, are military officers who are not members of the Politburo Standing Committee. While appeals to seniority might prevail in the short-term, the unexpected incapacitation of a Chinese leader would likely set off a succession crisis.

⁸⁹ "Expert: PLA Rocket Force May Have Strategic Nuclear Submarine, Bomber," *China Military Online*, January 8, 2016, http://english.chinamil.com.cn/news-channels/pla-daily-commentary/2016-01/08/content_6850119.htm, as Quoted in Logan, "China's Future SSBN Command and Control Structure," p. 5.

⁹⁰ "Annual Report on Military and Security Developments Involving the People's Republic of China," Department of Defense, 2018, p. 77.

ISRAEL

Employment Authority

While Israel's policy of *amimut*—opacity involving Israel's possession of nuclear weapons—inhibits the discussion of employment authority, some information is available, notably through the work of a small number of Israeli experts.⁹¹

According to the country's "Basic Laws"—which, together, form the equivalent of a Constitution—"The state may only begin a war pursuant to a Government decision."⁹² This requirement reflects the nature of decision making in Israel that arises from the tendency to govern by coalition. The prime minister has no statutory authority over the Israeli Defense Forces—the defense minister does, on behalf of the government. However, both law and practice allow for a more flexible decision-making. First, the same Basic Law states also that "Nothing in the provisions of this section will prevent the adoption of military actions necessary for the the defence of the state and public security."⁹³ Second, most defense decisions are taken by the "Ministerial National Security Cabinet," a restricted seven-to-ten-member grouping of the government formally instituted in 2001, though it already *de facto* existed. Thus, the practice allows for the prime minister and the defense minister to conduct limited responses designed to react, or thwart, immediate threats. A 2018 law codified this arrangement and allowed them to engage in major military operations without the full government backing in "extreme circumstances" if the "urgency" required it.⁹⁴ It is not clear what impact this has on nuclear use procedures, if any, or how it would function in the relatively common circumstance when the prime minister also serves as defense minister (as is currently the case, as of this writing).

Arrangements for nuclear-weapon use, initially established in 1967, reflected this tradition of collective decision making by requiring not only an order of the prime minister but also the involvement of at least another authority: probably the minister of defense, to whom the chief of the defense staff is

⁹¹ On Israel's national-security decision making, see: Charles D. Frielich, *Israeli National Security: A New Strategy for an Era of Change* (Oxford: Oxford University Press, 2018). On Israel's nuclear arsenal, see: Avner Cohen, *The Worst-Kept Secret: Israel's Bargain with the Bomb* (New York: Columbia University Press, 2010), in particular pp. 95–97, 185, and 297 (note 19).

⁹² *Basic Law: The Government* (2001), Art. 40(a), https://www.knesset.gov.il/laws/special/eng/basic14_eng.htm

⁹³ *Ibid.*, Art. 40(b).

⁹⁴ Amichai Cohen, "Will an Amendment to Israel's National Security Law Change the Rules of the Game?" *Lawfare*, January 4, 2018, <https://www.lawfareblog.com/will-amendment-israels-national-security-law-change-rules-game>; Sue Surkers and Raoul Wootliff, "PM authorized to declare war in 'extreme' situations without consulting cabinet", *Times of Israel*, May 1, 2018, <https://www.timesofisrael.com/pm-authorized-to-declare-war-in-extreme-situations-without-consulting-cabinet/>.

subordinate.⁹⁵ It is not clear, however, whether it is a formal authorization or a simple authentication of the order of engagement.⁹⁶

Writing in 1991, journalist Seymour Hersh suggested that “it was agreed that no nuclear weapon could be armed or fired without authorization from the prime minister, minister of defense, and army chief of staff. The rules of engagement were subsequently modified to include the head of the Israeli Air Force.”⁹⁷ Whether this description was correct at the time or remains current, it exemplifies the somewhat collective nature of Israeli nuclear decision-making culture.

Authentication and Transmission of Order

No details are available apart from the likely existence of a two-man rule. In his 1991 book, Hersh alleged that “three keys, to be supplied by representatives of the top civilian and military leadership,” were necessary to launch warheads.⁹⁸

Devolution Procedures

The “Basic Laws” of the country specify that it is possible to designate an acting prime minister (who must be a member of the Knesset). He or she would take office if the prime minister were “unable to discharge his duties.” If such a position were not held by any of the incumbent ministers, the government would vote to appoint one of their own members as acting prime minister.⁹⁹

⁹⁵ There is no constitutional function of “head of the armed forces.”

⁹⁶ One report claims that, “In Israel, leaders are unable to use nuclear weapons unilaterally and are constitutionally forced to deliberate with other senior establishment figures before nuclear use.” Though not inconsistent with what is written here, the laws or procedures such an assertion is referring to is not clear. Sebastian Brixley-Williams and Paul Ingram, “Responsible Nuclear Sovereignty and the Future of the Global Nuclear Order,” British American Security Council, 2017, p. 6.

⁹⁷ Seymour Hersh, *The Samson Option: Israel’s Nuclear Arsenal and American Foreign Policy* (New York: Random House, 1991), p. 217.

⁹⁸ Ibid.

⁹⁹ *Basic Law: The Government* (2001), Art. 5, Art. 16, https://www.knesset.gov.il/laws/special/eng/basic14_eng.htm.

INDIA

Employment Authority

The National Command Authority (NCA) established in 2003 comprises a Political Council and an Executive Council.¹⁰⁰ Only the Political Council can authorize the use of nuclear weapons (even though the president is the head of the armed forces). A 2014 report referred to a “collegiate process.”¹⁰¹

The Political Council is chaired by the prime minister and reportedly includes the ministers forming the Cabinet Committee on Security (defense, foreign affairs, home affairs, and finance) as well as the national security advisor.

However, it is widely understood that the prime minister likely holds the employment authority. The same 2014 report said that “the final call will rest with [the prime minister]” and “for all practical purposes, the nuclear button will be wielded by [the prime minister].”¹⁰² This was confirmed by the 2017 Joint Doctrine for the Armed Forces, which described the Political Council as “the only body empowered to take a decision on nuclear issues while the ultimate decision to authorize the use of nuclear weapons rests solely with the prime minister.”¹⁰³

The Executive Council is chaired by the national security advisor and reportedly includes the service chiefs as well as other authorities such as the intelligence chiefs and the heads of the nuclear and missile programs.¹⁰⁴

Authentication and Transmission of Order

Even though the Executive Council “executes the directives given to it by the Political Council,” the order would probably go directly to Strategic Forces Command (SFC), which reports to the prime minister.

¹⁰⁰ India Press Information Bureau, “Cabinet Committee on Security Reviews Progress In Operationalizing India’s Nuclear Doctrine,” January 4, 2003.

¹⁰¹ Rajat Pandit, “Narendra Modi has his finger now on India’s nuclear button,” *Times of India*, May 27, 2014. <http://timesofindia.indiatimes.com/news/Narendra-Modi-has-his-finger-now-on-Indias-nuclear-button/articleshow/35625045.cms>

¹⁰² Pandit, “Narendra Modi has his finger now on India’s nuclear button.”

¹⁰³ Joint Doctrine for the Indian Armed Forces, April 2017, p. 37. See Abhijnan Rej and Shashank Joshi, “India’s Joint Doctrine: A Lost Opportunity,” Observer Research Foundation Occasional Paper, No. 139, January 2018, pp. 21–22, http://cf.orfonline.org/wp-content/uploads/2018/01/ORF_Occasional_Paper_Joint_Doctrine.pdf.

¹⁰⁴ Harsh V. Pant, “India’s Nuclear Doctrine and Command Structure: Implications for India and the World,” *Comparative Strategy*, Vol. 24, No. 3, 2005, p. 280.

A special role is probably assigned to the national security advisor, who is reportedly “the operational controller of CINC [commander-in-chief] SFC.”¹⁰⁵ An informed Indian analyst has mentioned the existence of a “Strategy Programme Staff” in the NSC Secretariat for NCA-related work.¹⁰⁶ This may be the “nuclear cell” mentioned elsewhere.¹⁰⁷ Vipin Narang suggests that, “for all practical purposes, the [prime minister] may not be able to release nuclear weapons without the [national security adviser], who is the interface between the NCA and the [SFC].”¹⁰⁸ It is thus possible that the NSA acts as an authenticator.

The same official 2017 text refers to the SFC as controlling “all of India’s nuclear warheads and delivery systems.”¹⁰⁹ Analysts note that, if this were the case, it would be a change from the previous situation, where warheads were under the strict custody of the Department of Atomic Energy and the Ministry of Defense’s Defense Research and Development Organization until the order was given, in line with India’s practice of civilian control.¹¹⁰

The two (or more)-man rule likely applies along the chain of command. According to a former head of the SFC, there are “multiple redundancy and dual-use release authorization at every level.”¹¹¹ The same former official claimed that “specific targeting package” would be transmitted along the release order.

As early as 2003, Indian authorities mentioned the establishment of nuclear command posts in concrete bunkers at “secure locations.”¹¹² According to an authoritative commentator, “the NCA has access to radiation hardened and fully secured communication systems, and redundancies have been put in place as back-up facilities.”¹¹³ It is likely that dedicated communication means have also been established (including, probably, for the new “Air India One” presidential plane, a modified Boeing 777).

¹⁰⁵ Verghese Koithara, *Managing India’s Nuclear Forces* (Washington, DC: The Brookings Institution, 2012), p. 190.

¹⁰⁶ Shyam Saran, “Weapon that has more than symbolic value,” *The Hindu*, October 1, 2016, <https://www.thehindu.com/opinion/lead/Weapon-that-has-more-than-symbolic-value/article12121573.ece>.

¹⁰⁷ Bharat Karnad, “INS: Indian Nuclear Service,” *Asian Age*, August 16, 2012, <http://www.asianage.com/columnists/ins-indian-nuclear-service-094>.

¹⁰⁸ Vipin Narang quoted in Union of Concerned Scientists, “Whose Finger is on the Nuclear Button?,” p.5.

¹⁰⁹ Joint Doctrine for the Indian Armed Forces, p. 37.

¹¹⁰ Rej and Shoshi, “India’s Joint Doctrine.” See also Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton: Princeton University Press), pp. 105–08.

¹¹¹ Vice Admiral Vijay Shankar (ret.), quoted in Narang, *Nuclear Strategy in the Modern Era*, p. 106.

¹¹² See Pant, “India’s Nuclear Doctrine and Command Structure,” p. 280.

¹¹³ Saran, “Weapon that has more than symbolic value.”

Devolution Procedures

There is no interim prime minister or designated successor in India in the constitutional sense, although there is sometimes a deputy prime minister.¹¹⁴ Analysts insist that there is no “statutory succession”¹¹⁵ and that India does not have “a Constitutional chain of ‘pre-delegated’ succession, under which the nuclear launch authority is automatically transferred to the next in line,”¹¹⁶ while acknowledging that “there is likely to be delegated successor(s) in a position to act till a new Prime Minister is sworn in.”¹¹⁷

Indeed, it was announced in 2002 that “alternate chains of command for retaliatory strikes in all eventualities” had been arranged.¹¹⁸ An official has confirmed that this would apply “if the political leadership is ‘decapitated’ in a first strike.”¹¹⁹ An authoritative source refers to “an alternate NCA which would take up the functions of the nuclear command in case of any contingency that renders the established hierarchy dysfunctional.”¹²⁰

¹¹⁴ There has not been one since 2004.

¹¹⁵ Koithara, *Managing India's Nuclear Forces*, p. 102.

¹¹⁶ Pandit, “Narendra Modi has his finger now on India's nuclear button.”

¹¹⁷ Koithara, *Managing India's Nuclear Forces*, p. 102.

¹¹⁸ India Press Information Bureau, “Cabinet Committee on Security Reviews Progress In Operationalizing India's Nuclear Doctrine.”

¹¹⁹ Pandit, “Narendra Modi has his finger now on India's nuclear button.”

¹²⁰ Saran, “Weapon that has more than symbolic value.”

PAKISTAN

Employment Authority

Pakistan's nuclear forces are under the control of the National Command Authority (NCA) established in 2000 and legally formalized in 2007.

Established by Pervez Musharraf after he seized power in the 1999 military coup, the NCA was initially chaired by the president until President Asif Ali Zardari ceded the position to Prime Minister Yousaf Gillani in 2009. The 2010 National Command Authority Act made this change official: as part of the effort to weaken the overall powers of the president—embodied in the adoption of the 18th Amendment to the Constitution—the prime minister now also holds the position of NCA chair.¹²¹ The 2010 Act made two other changes: there is no longer an NCA vice chairman, and the director-general of the Strategic Planning Division (SPD, part of the Joint Chiefs of Staff), the key officer in charge of nuclear weapons and programs, is no longer a full, *ex officio* member, but the “secretary of the authority.” The NCA is thus now composed of nine people: the country's top five political officials and its top four military officials.¹²²

The use of nuclear forces is the responsibility of the Employment Control Committee (ECC). Its composition is not defined by the 2010 Act. However, it is known to be, in effect, the members of the NCA meeting in a different format, to which could be added “by invitation—others as required.”¹²³ The prime minister is its chairman, the minister of foreign affairs its vice-chairman.

The deliberative process for nuclear use has been described as being akin to that of a “board of directors.”¹²⁴ The NCA affirmed the principle of unanimity in 2003.¹²⁵ A decision to use nuclear weapons would need “consensus within the NCA, with the chairman casting the final vote.”¹²⁶ But if

¹²¹ National Command Authority Act, 2010, March 11, 2010, pp. 75–83. Nevertheless, under the Constitution, the prime minister remains the head of the armed forces.

¹²² Prime minister; ministers of foreign affairs, defense, finance, and home affairs; chairman of the Joint Chiefs of Staff; chiefs of army, navy, and air force staff.

¹²³ See Naeem Salik, *Learning to Live with the Bomb: Pakistan: 1998-2016* (Oxford: Oxford University Press, 2017), p. 158, as well as Feroz Hassan Khan, *Eating Grass: The Making of the Pakistani Bomb* (Stanford: Stanford University Press, 2012), p. 334. The prime minister's advisor on foreign affairs and the special assistant to the prime minister on foreign affairs have occasionally attended (Salik, *Learning to Live with the Bomb*, p. 170).

¹²⁴ Author's source, 2008.

¹²⁵ “NCA to decide on use of N-weapons,” *Dawn*, January 7, 2003, <https://www.dawn.com/news/76473>.

¹²⁶ Major General Mahmud Ali Durrani, “Pakistan's Strategic Thinking and the Role of Nuclear Weapons,” Cooperative Monitoring Center Occasional Paper, SAND 2004 3375P, Sandia National Laboratories, July 2004, p. 24.

consensus were impossible, a majority vote would suffice.¹²⁷ The ECC now comprises five civilians and four military *ex officio* members (as NCA member), plus the SPD head.¹²⁸ Thus, it is not unreasonable to conclude that the military leadership would be the *de facto* decision maker since it holds the majority in the ECC. However, the military would probably ensure that the civilians shared the responsibility of the decision to use nuclear weapons.

In case the prime minister has an additional portfolio (foreign affairs and/or defense), deputies would sit for the lower-level ministers.¹²⁹

Authentication and Transmission of Order

Pakistani officials have repeatedly affirmed there are strict control procedures in place, and insist that they have an “assertive” type of command and control.¹³⁰ The SFC does not control warheads in peacetime. There are, reportedly, both authorizing and enabling codes.¹³¹ Some sources have referred to a system of two separate codes, one civilian and one military.¹³² This could refer to the classical distinction between authorizing and enabling codes.

A two-man rule operates. However, at some points in the chain of command, a three-man rule operates “for technical reasons.”¹³³ According to a former SPD official, the enabling code is “divided between three people.”¹³⁴ Another former SPD official thus suggests that the two-man rule could refer to the movement of warheads, while use would require three persons.¹³⁵

Channels of communication for strategic forces are “independent” from those devoted to conventional forces.¹³⁶

¹²⁷ Gen. Khalid Kidwai (ret.) quoted in Matthew Pennington, “Pakistan: Nuclear Assets Safe, Outlines Nuclear Protocol,” Associated Press, January 26, 2008.

¹²⁸ Ibid.

¹²⁹ Author’s source, 2013.

¹³⁰ Interviews quoted in Salik, *Learning to Live with the Bomb*, p. 172.

¹³¹ Gen Khalid Kidwai (ret.) quoted in Shaun Gregory, “The Security of Nuclear Weapons in Pakistan,” Brief No. 22, Pakistan Security Research Unit, November 18, 2007, p. 4.

¹³² Khan, *Eating Grass*, p. 331.

¹³³ Author’s source, 2008.

¹³⁴ Durrani, “Pakistan’s Strategic Thinking and the Role of Nuclear Weapons,” pp. 24, 33.

¹³⁵ Khan, *Eating Grass*, p. 331.

¹³⁶ Salik, *Learning to Live with the Bomb*, p. 146.

In the early 2000s, Pakistani planners asserted that no delegation of authority was planned.¹³⁷ However, the 2010 Act specifies that the NCA chair “may in consultation with NCA and subject to such limitations as [s/]he may specify delegate any of these powers and functions to CJCS [chairman of the Joint Chiefs of Staff] Committee and DG SPD [director general, Strategic Plans Division], who may further sub-delegate the same to any employee.”¹³⁸ A former SPD official has confirmed that “the ECC is responsible for establishing a hierarchy of command and policies to delegate authority for the use of nuclear weapons.”¹³⁹

Devolution Procedures

There is no constitutional or interim procedure for devolution and former senior officials have noted that this could be a problem.¹⁴⁰

However, Pakistani officials have made it clear that, in the contingency of the chair (prime minister) being unavailable, the vice chairman (minister for foreign affairs), would assume the chair role of the NCA and thus also, presumably, in the ECC.¹⁴¹

This assumes that the two functions would not belong to the same person, as has sometimes been the case (see above). In any case, Pakistani officials report that the devolution chain includes other civilian authorities, and only at the “seventh level” (that is, if the six previous authorities were incapacitated) would the prime minister’s authority be entrusted to a military official.¹⁴²

¹³⁷ See Paolo Cotta-Ramusino and Maurizio Martellini, “Nuclear Safety, Nuclear Stability and Nuclear Strategy in Pakistan: A Concise Report of a Visit by Landau Network-Centro Volta,” January 2002; <https://pugwash.org/2002/01/14/report-on-nuclear-safety-nuclear-stability-and-nuclear-strategy-in-pakistan/>; and Zafar Iqbal Cheema, “Pakistan,” in Born, Gill, and Hänggi, *Governing the Bomb*, p. 208.

¹³⁸ National Command Authority Act, 2010.

¹³⁹ Salik, *Learning to Live with the Bomb*, p. 159.

¹⁴¹ Author’s source, 2013. See also Cheema, “Pakistan,” p. 204.

¹⁴² Author’s source, 2013.

NORTH KOREA

Employment Authority

The 2013 law stipulates that North Korean “nuclear weapons can be used only by a final order of the Supreme Commander of the Korean People’s Army (KPA).”¹⁴³ Until 2016, this function belonged to the first chairman of the Party’s National Defense Commission, the incumbent of which was the country’s principal political leader. It now belongs to the chairman of the State Affairs Commission, the main title currently held by Kim Jong Un.¹⁴⁴

The Commission seems to have only a formal role and North Korean statements insist on the “absolute” power of the supreme leader. In early 2018, Kim Jong Un claimed that “the nuclear button is on my office desk all the time,” but it is not clear whether this alludes to the presence of any physical device specifically designed for such a purpose.¹⁴⁵

Key military officials could be involved in the final decision-making process: the chief of the KPA’s Army General Staff Department, the director of the KPA General Staff Operations Bureau, the director of General Reconnaissance Bureau, and the commander of Strategic Rocket Forces.¹⁴⁶

The nominal North Korean head of state (president of the Presidium of the Supreme National Assembly) does not play any role in military affairs; in 1998, this role was bestowed upon the late Kim Il Sung *ad infinitum*.¹⁴⁷

Authentication and Transmission of Use

The order could be transmitted through the Strategic Forces Command created in March 2012.

¹⁴³ “Law on Consolidating Position of Nuclear Weapons State Adopted,” Korean Central News Agency, April 1, 2013.

¹⁴⁴ Kim Jong Il held this position for a year before his father’s July 1994 death.

¹⁴⁵ Kim Jong Il, “New Year’s Address,” January 1, 2018, <http://www.nkleadershipwatch.org/2018/01/01/new-years-address/>.

¹⁴⁶ Alexandre Y. Mansourov, “Kim Jong Un’s Nuclear Doctrine and Strategy: What Everyone Needs to Know,” NAPSNet Special Reports, December 16, 2014, <https://nautilus.org/napsnet/napsnet-special-reports/kim-jong-uns-nuclear-doctrine-and-strategy-what-everyone-needs-to-know/>.

¹⁴⁷ Kim Il Sung was elevated to the rank of “Eternal President” in 1998.

Devolution Procedures

It may take some time between the death of a North Korean leader and the appointment of his successor as Supreme People's Army Commander. In 2011, after the death of Kim Jong Il, this process took a week. It is possible that one of the vice presidents is in charge during the interim.

A 2016 reform amending the 1972 Constitution replaced the National Defense Commission with a State Affairs Commission as the highest decision-making institution in the country. The Supreme People's Assembly appoints the chairman of the State Affairs Commission.¹⁴⁸

The fear of decapitation by the United States may have led Pyongyang to set up a devolution mechanism or, at the very least, procedures to follow in such a case. Today, the succession could formally pass to the *de facto* number two of the regime, Choe Ryon Hae, or, to an immediate member of the Kim family, either Kim Jong Un's older brother, Kim Jong Chul, or his sister, Kim Yo Jong.¹⁴⁹

Very little is known about how North Korea plans for extreme scenarios. Some may have led the country to set up a “fail-deadly”-type procedure (an automatic response absent a countermanding order), in case Pyongyang was destroyed, for instance.

One question remains about the nature—if any—of arrangements in the event of the Supreme Leader's absence from the country, such as during his travels abroad.

¹⁴⁸ JH Ahn, “N. Korea updates constitution expanding Kim Jong Un's position,” *NKnews.org*, June 30, 2016, <https://www.nknews.org/2016/06/n-korea-updates-constitution-expanding-kim-jong-uns-position/>.

¹⁴⁹ There is a general assumption that the patriarchal tendencies of the North Korean elite would favor dynastic succession among male relatives. Kim Jong Un has, however, relied far more heavily on his sister than his older brother, who was reportedly passed over. Kim is believed to have three children with his wife, Ri Sol Ju, at least one of whom is a girl. Analyst Jung Pak wrote that, despite the country's patriarchal culture, she “wouldn't rule out the possibility for Kim to choose a daughter to lead North Korea, given his ‘modern’ tendencies.” See: Jung Pak, “The Education of Kim Jong Un,” Brookings Institution, February 2018, <https://www.brookings.edu/essay/the-education-of-kim-jong-un/>.

CONCLUSIONS

There is no single national model for authorizing the use of nuclear weapons. Although almost all nuclear-armed states claim to have a two-man rule, many of them assign an important role to the defense secretary and/or to the chief of defense staff or its equivalent (though details are often unclear), and have established devolution procedures.¹⁵⁰

There are, however, broadly speaking, two schools in this regard:

- “Parliamentary”-type regimes, where political authority to command the armed forces (and thus use nuclear weapons) is delegated to an appointed prime minister, and where the decision to launch a nuclear strike would necessarily not be the sole authority of one individual, even if it is one “on paper” (i.e. legally). This includes the United Kingdom, India, and Pakistan, as well as Israel.
- “Presidential”-type regimes where political authority clearly rests in the hands of one single person elected by the people. In this regard, France and Russia appear to be the closest models to the United States.
- China and North Korea are *sui generis* examples, but the former might be more collective, in effect, than the latter.

“Presidential”-type nuclear decision models favor speed and legitimacy (i.e. the launch order can only be given by a leader directly elected by the people). But there is little evidence that potential adversaries view “parliamentary”-type nuclear decision models as less credible.

Even in such models, it is too simplistic to claim that “one single person’s orders” are enough to launch a nuclear strike. This may be true legally, but not physically:

- From the officer holding the “football” to the officers in launch units with keys or combinations to safes, the chain of command and process of authentication always requires the positive participation of a number of human decision makers. There may be *automated* processes along the chain of command, but there is nothing *automatic* in the execution of a launch order. Even in the extreme case of *Perimetr*, the system must be switched on and there remains a person in the decision loop.
- Moreover, the presence of human decision makers throughout the chain of command is usually augmented with two-person “rules.” With the exception of North Korea, all nuclear-capable countries claim to require two persons at certain points, albeit in various ways.

¹⁵⁰ The United Kingdom and Russia are likely the only two countries with known predelegation procedures.

A key distinction is between the “authorization” to launch and the “ability” to launch. The former is a political process, the latter a military one. The authorization process has also a negative dimension: its function is “not to act as a trigger to launch nuclear weapons, but as a safety catch preventing other triggers from firing.”¹⁵¹

The presence of multiple human decision makers in the chain of command raises the possibility that individuals would resist an unlawful order to use nuclear weapons in the case of a completely out-of-the-blue nuclear strike. For example, there are some reports that captains of US SSBNs are expected to make communications contact in the event of unexpected launch order that seems out of place or character. At least one captain has indicated that, in the event of a peacetime launch, he would insist on confirmation and a justification.¹⁵²

There are, however, legitimate questions that might be asked about such arrangements. If the authority is conferred to one single person, the possibility increases that a completely irrational order might be followed in a crisis. An additional and infrequently raised question concerns devolution processes: how would the system work if the successor authority were an unelected official, such as the fourth person in the US line of succession (a secretary)? And can this mechanism even be considered legitimate when the fate of tens of millions of lives could be in the balance?

There does not appear to be any satisfactory way to devise nuclear decision-making mechanisms that reconcile all imperatives such as credibility, legitimacy, efficiency, as well as security (control of nuclear warheads).

However, one may question whether decision-making procedures should always be the same, whatever the circumstances. In particular, given the extraordinarily low probability, for most countries, of a fully disarming surprise attack, it seems perfectly legitimate to envision an adjustment of mechanisms (such as launch-on-warning) that were initially devised for such scenarios, without fundamentally altering the logic of deterrence. A deliberative process, such as that which is supposed to happen in India and Pakistan, might be in order for all nuclear-armed states.

¹⁵¹ Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven, CT: Yale University Press), 1983, p. 196.

¹⁵² See Douglas C. Waller, *Big Red: Inside the Secret World of a Trident Nuclear Submarine* (New York: Harper Collins, 2001), pp. 247–48.

	United States	Russia	United Kingdom	France	China	Israel	India	Pakistan	DPRK
Official text establishing authority?	Yes	Yes	Yes (Defense)	Yes (Defense Code)	Yes (Doctrine)	No	Yes	Yes	Yes (Constitution)
Authority	President	President	Prime Minister	President	Central Military Commission (President)	Prime Minister	NCA Political Council (Prime Minister)	NCA Employment Control Committee	Supreme Leader/Chairman of State Affairs Council
<i>Elected by the people?</i>	<i>Yes (Indirect)</i>	<i>Yes (Direct)</i>	<i>Appointed</i>	<i>Yes (Direct)</i>	No	<i>Appointed</i>	<i>Appointed</i>	<i>Appointed</i>	No
<i>Head of State?</i>	Yes	Yes	No	Yes	Yes	No	No	No	No
<i>Head of armed forces?</i>	Yes	Yes	No	Yes	Yes	No	No	No	Yes
Other key authorities involved	JCS Chairman <i>Defense Secretary?</i>	Defense Minister Chief of General Staff	Two authenticators <i>Chief of Defense Staff?</i>	Head of Private Military Office Chief of Defense Staff	?	Defense Minister Chief of Defense Staff	National Security Advisor	<i>Chiefs of Staff?</i>	?
Constitutional successor	Vice president	Prime Minister		President of the Senate					
Collective deliberation?	No	No	No	No	(Yes)	(No)	(Yes)	(Yes)	No
Special devolution procedures?	Yes	Probably	Yes	Yes	Probably	Probably	Yes	Yes	?
In extremis devolution authorities	Designated successors	?	Nuclear Deputies	Prime Minister Defense Minister	?	?	?	?	?
Pre-delegation under specific conditions		Perimeter launch officers	SSBN commander (Letters of Last Resort)						

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