CHAPTER 1

THE UNEXPECTED RISK: THE IMPACT OF POLITICAL CRISES ON THE SECURITY AND CONTROL OF NUCLEAR WEAPONS

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The past 2 decades have seen an increase in nuclear dangers. Arsenals have been operationalized in India and Pakistan, and China seems to be augmenting its own. North Korea has crossed the nuclear threshold, and Iran seems to be on the way to do so itself. Four hitherto undisclosed—and illegal—nuclear programs were discovered: Iraq in 1991, Iran in 2002, Libya in 2003, and Syria in 2007. Pakistani and North Korean nuclear expertise and technology transfers were also uncovered. Al-Qaeda and other jihadist groups showed an interest in gaining access to nuclear weapons and materials, and some attacked nuclear-related facilities in Pakistan.

The security and control of nuclear weapons is thus more important than ever, as witnessed by the political success of two Nuclear Security Summits in Washington (2010) and Seoul (2012). Despite disagreement over budget priorities, the topic enjoys a rare level of bipartisanship in the United States.

Much has been written about nuclear accidents and nuclear crises, but much less about the impact of political crises in nuclear-capable states.[1] The goal that Henry Sokolski and I set in undertaking this project was to shed light on the following issue: How do nuclear-capable states behave in times of major political crises?

Our project focuses more specifically on "nuclear security" and "control of use." According to the U.S. Department of Defense, *nuclear security* covers procedures, facilities, and equipment designed to avoid loss of custody, theft, and diversion of nuclear weapons, as well as other unauthorized actions, vandalism, and sabotage. *Control of use* covers both use control (components and codes) as well as command and control (organizational and communications procedures and capabilities).[2]

At first glance, all nuclear-armed countries today seem to have well-established procedures and institutions to ensure nuclear security and control of use. In Western countries, as well as in India and Israel, the primacy of civilian and political officials over nuclear oversight and control is apparently well entrenched.[3]

However, the global picture of nuclear security and control is much less rosy than it seems. First, things are more complex than they appear in countries such as Russia, China, and Pakistan, where the military has a stronger and sometimes key role.

- In Russia, there is not one but three "Chegets" (strategic communication devices): one for the president, one for the defense minister, and one for the chief of general staff. Some claim that the agreement of all three authorities (plus that of one of the strategic forces commanders) is needed to launch a nuclear strike.[4] But most informed sources state that any of the three can launch a nuclear strike.[5] What seems clear in any case is that nuclear use does not technically require any input from the Russian president. (This was the case in the Soviet Union.)[6] A well-known Russian expert has stated that "real control over nuclear weapons has never been

in the hands of the political leadership. It has always been under the control of the defense minister and the General Staff."[7] He wrote more recently that "It is not clear whether the system is fail-safe from the action of reckless military commanders."[8] Indeed, other testimonies have stated that, technically, the ability to launch nuclear weapons exists well below the upper echelons of Russian political and military power.[9]

- In China, procedures remain unclear, but it seems that any decision to use nuclear weapons would be made by a combination of top party and military leaders.[10]
- In Pakistan, despite the prime minister's chairmanship of the National Command Authority, few doubt that the military would have the final say in the use of nuclear weapons, especially since the "Employment Control Committee" involves the main armed forces leaders.

Second, the history of nuclear security and control is fraught with lax procedures and insufficient measures compounded by human mistakes.[11] Even in Western nuclear powers, the establishment of solid command and control procedures took time and has often been insufficient, in no small part because the elaboration of nuclear deterrence procedures is submitted to a fundamental dilemma. Survivability and readiness call for dispersion, movement, and pre-delegation. But security and control call for concentration, no movement, and code retention. The problem is that, to use Peter Feaver's apt characterization, procedures tend to err on the side of "always" (i.e., always be fired when directed) rather than on the side of "never" (i.e., never be fired if not ordered by a proper authority).[12]

Pre-delegation existed at least in the United States and in the United Kingdom (UK) in the 1950s.[13] In the United States, combination locks on nuclear warheads appeared only in the late-1950s. In 1960, the U.S. Joint Committee on Atomic Energy discovered that security measures designed to prevent the theft or unauthorized use of U.S. nuclear weapons in Europe were limited to a single 18-year-old sentry armed with a carbine.[14] This led to the development and introduction of Permissive Action Links (PALs). But it did not solve the North Atlantic Treaty Organization (NATO) nuclear security problem. In the mid-1970s, tactical nuclear weapons in Germany were so poorly secured that a small group of terrorists could have easily stolen them. In the early-1980s, about half of the U.S. arsenal in Europe was still equipped with old four-digit combination locks. In France, early command and control arrangements were, to say the least, rudimentary: General Charles de Gaulle thought that he had a sufficiently recognizable voice so that his military commanders would know it was him giving the order.[15] In Western countries and in the Soviet Union, "nuclear briefcases" were introduced only in the 1980s. Until the early-1990s, American (and Soviet) nuclear-powered ballistic missile submarine (SSBN) commanders were still technically able to launch their missiles without any input from outside.[16] UK SSBN commanders still can. The UK WE-177 free-fall bombs that were withdrawn in 1998 "were armed by turning a bicycle lock key."[17]

Thus, it can hardly be taken for granted that the next nuclear powers will be "born" with solid security and control procedures. In fact, if Scott Sagan is to be believed, "there are compelling reasons to predict that many would-be proliferators will develop nuclear

arsenals that are considerably less safe than those of current nuclear powers."[18]

In addition, nuclear institutions are as likely as any other complex organization to undergo what experts call "normal accidents," despite—and sometimes, experts argue, because of—efforts to build in redundancies and safeguards to take into account technical failures and human frailties.[19]

We suspect that such existing weaknesses, which are inherent to any complex human organization, could be magnified if a major institutional or political crisis was to occur in a nuclear-armed country. At best, this means that nuclear weapons or technologies could fall into the wrong hands (state or nonstate actors), with the risk of regional instability, political blackmail, and nuclear accidents. At worst, such a crisis can mean a nuclear explosion or a nuclear war.

Indeed, the list of serious nuclear security and control incidents, failures, and lapses is a rather long one. Some of the most egregious include the following:[20]

- In April 1961, control of the French nuclear site in Algeria and of a nuclear device that was located there became the object of competing loyalties as a coup d'état unfolded in Algiers.[21]
- In October 1962, during the Cuban Missile Crisis, a security guard at a Duluth, MN, military base mistakenly took a bear for an enemy intruder and sounded the alarm. This triggered air-raid klaxons in the region. However, at the nearby Volk Airfield, due to a faulty system, the nuclear attack alert was sounded, causing nuclear-armed F-106A to scramble for takeoff.[22]
- Two days later, North American Air Defense (NORAD) radar picked up an unidentified object flying in space; because this happened

at the same time that a test tape had been introduced in the equipment, the NORAD command post mistakenly thought that a missile had been launched from Cuba, targeted against Florida.[23]

- In December 1963, when U.S. President Lyndon B. Johnson took office, the director of the White House Military Office discovered that no one had updated the authenticator codes for 6 months.[24]
- In September 1966, the Chinese Cultural Revolution led to internal strife within the nuclear program. The center of Chinese nuclear research and development (R&D) was split between two factions.[25]
- In October 1966, the newly created Second Artillery Corps (the Chinese strategic missiles force)—inspired by calls from radicals to accelerate the nuclear weapons program—conducted a dangerous test of a nuclear-tipped missile, which flew over population centers, to demonstrate revolutionary spirit. This was seen by some as an unauthorized test.[26] Throughout 1966-67, the Second Artillery Corps was rife with rivalries and power struggles.[27]
- At the same time, the Lop Nor testing site was also the focus of a competition for power.[28] Around December 1966, the Party boss of Xinjiang is believed to have made an indirect threat to seize the site. A December 1967 test was seen to have been a "fizzle" due to a hasty detonation.[29]
- In the mid-1970s, U.S. Senator Sam Nunn discovered that the NATO nuclear base he visited was guarded by units composed of demoral-

ized soldiers with stories of regular alcohol and drug consumption.[30]

- Until 1977, the U.S. Strategic Air Command (SAC) reportedly used intercontinental ballistic missile (ICBM) launch procedures that bypassed the normal coding mechanisms.[31]
- In November 1979, the insertion of an exercise tape into a NORAD computer triggered a threat assessment conference and an air defense alert, including the launch of the National Emergency Airborne Command Post.[32]
- In March 1981, U.S. President Ronald Reagan's authenticator codes disappeared in a Federal Bureau of Investigation (FBI) evidence bag after he was shot.[33]
- A few months later in May 1981, French President François Mitterrand was so moved by his election that he forgot the launch codes, given to him by his predecessor, at home in the suit he was wearing the day before.[34]
- In 1988, after General Zia Ul-Haq's sudden death, the new Pakistani president (1988-93) Ghulam Ishaq Khan, decided to retain the nuclear program's secret files under his control instead of turning them over to the prime minister. He turned them over to the military when forced to retire in 1993.[35]
- In the 1990s, the so-called A. Q. Khan network managed to copy three Pakistani nuclear warhead designs. The first one, of Chinese origin, was given to at least one country (Libya). The two others–plans for more sophisticated devices–were digitalized by the network and may have been transferred to other states or entities.

- In January 1990, rebels fighting Moscow's rule in Azerbaijan stormed the perimeter at an army base and tried to steal the nuclear weapons stored there.[36] This triggered a massive, hurried, and partly improvised withdrawal of tactical nuclear weapons stationed in the smaller Soviet Republics.[37]
- In the spring of 1991, a communication error resulted in Ukrainian officers receiving an order to make a loyalty oath to Russia. This led the Kiev leadership to intervene to block the withdrawal of tactical nuclear weapons and take steps to gain access to launch control systems of strategic weapons.[38]
- In August 1991, during the attempted coup against him, Mikhail Gorbachev was deprived of his "Cheget," while Defense Minister Dmitry Yazov (one of the putsch leaders) lost his own in the turmoil.[39] At some point, the coup leaders were in possession of all three Chegets.[40]
- In late-1991, Ukraine sought to prevent Russia from being able to launch nuclear weapons still stationed on its soil. Subsequently, Ukraine ordered a study of the possibility of bypassing the launch codes.[41]
- In July 1993, Russian Defense Minister General Pavel Grachev abruptly took possession of the Cheget belonging to Marshal Yevgeniy Shaposhnikov, the commander in chief of the Commonwealth of Independent States (CIS).[42]
- In October 1993, during an attempted coup in Moscow, militarized squads of supporters of the Supreme Soviet attacked the General Staff building, which hosts the Russian nuclear command and control center.[43]

- In January 1995, the launch of a Norwegian sounding rocket triggered the activation of Russia's strategic emergency command, control, communications, and intelligence (C3I) system ("Kazbeck") and of the Chegets. Oslo had notified the Russian Foreign Ministry of the impeding launch, but launch notification had gotten lost in the meanders of the post-Soviet bureaucratic disorder: It had failed to reach the appropriate on-duty personnel.[44] Given the unusual size and trajectory of the rocket, some Russian officials genuinely feared, for several minutes, a strike that might have been an Electro-Magnetic Pulse (EMP) attack.[45]
- In November 1995, during Russian President Boris Yeltsin's heart attack, his Cheget was illegally taken away from him by General Alexandr Korzhakov, his chief of presidential security, who reportedly declared, "Whoever has the button has the power."[46]
- In April 1999, after a NATO Summit, U.S. President Bill Clinton left behind his military aide carrying the "football." The aide had to walk back to the White House by himself in a hurry.[47]
- Around 2000, Clinton misplaced his presidential authentication card. The loss was discovered only after several months, when it was time to update the codes.[48]
- In August 2007, a U.S. B-52H strategic bomber mistakenly carried six nuclear-tipped Advanced Cruise Missiles (ACM) from Minot Air Force Base (AFB) to Barksdale AFB. The nuclear warheads were supposed to have been removed.
- Since the late-2000s, Pakistani terrorists have attacked several military installations sus-

pected of holding nuclear weapons-related facilities or research.[49]

- In January 2010, European anti-nuclear activists penetrated the inner perimeter of a NATO nuclear base in Belgium.[50]

We selected four case studies: China, France, Pakistan, and the Soviet Union. The time frame of each case study varies, ranging from a few days for France (the 1961 attempted military coup) to several decades for Pakistan. But we believe that these four countries are good examples of the sort of risks that we are talking about.

In addition, we noted that all four of them had experienced severe political upheavals, including *coups d'état* (Pakistan in 1958, 1977, and 1999); attempted coups (France in 1961, the Soviet Union in 1991, and Russia in 1993); major institutional crises (France in 1958 and China in 1966-68); and even breakups (France in 1962 and the Soviet Union in 1991). By comparison, the five other countries that have developed nuclear weapons (the United States, the United Kingdom, South Africa, India, and North Korea) have been much more stable from an institutional point of view. But this still means that *out of nine states that built nuclear weapons, four are known to have undergone severe political crises affecting nuclear security and/or control of use in one way or another, thus, nearly 50 percent.* These states include the three countries (China, Pakistan, and the Soviet Union/Russia) where the military traditionally has played a strong role in the political system. In two cases (France in 1961 and China in 1967), there is evidence that political turmoil and threats against testing sites resulted in the hurried detonation of nuclear devices.

When we began this project, we knew that others had cleared the path before us. In 1978, Lewis

Dunn published a seminal article entitled "Military Politics, Nuclear Proliferation, and the Nuclear 'Coup d'Etat'."[51] He pointed out that most of the potential proliferators had experienced attempted or successful military coups and, among other insights, suggested that "in the many politically unstable, coup-vulnerable, future N-th countries, access to nuclear weapons could become a sought-after source of power and bargaining leverage."[52] In 1987, Leonard ("Sandy") Spector devoted a chapter in his book, *Going Nuclear,* to the effect of political instability on nuclear control.[53] There have also been many detailed historical studies on nuclear security, at least for the Union of Soviet Socialist Republics (USSR) and Pakistan.

The added value of the case studies presented here is threefold. First, not all cases have been well covered by the existing literature (France in 1961, in particular). Second, new evidence and new sources have become available over the years. Third, and most importantly, we asked our authors, who are all experts in the nuclear programs of the countries we chose, to focus on one key question: How did political instability affect nuclear security and use control?

Our project does not claim to give the definitive historical account or to shed light on all the incidents that may have taken place in these four countries.[54] But it brings new insights and sometimes contradicts conventional wisdom. Tertrais (for France) and Khan (for Pakistan) make the case that the nuclear risks stemming from political instability and attempted coups were less than many believed. In contrast, Sokov (for the Soviet Union/Russia) and Stokes (for China) raise intriguing questions and describe troubling and not well-known episodes.

Leonard Spector's 1987 conclusions were fourfold. First, he argued that "Nuclear weapons . . . can indeed

change hands as political control abruptly shifts over the territory where they are located." Second, he suggested that "It is not implausible that a radical, anti-status-quo government can sweep into power and inherit significant nuclear assets." Third, he believed that "Preventing the inheritance of nuclear assets is likely to be costly and complicated, and in some cases, it may not be possible at all." Finally, Spector argued that, "Though a radical government has never inherited nuclear arms, there is historical precedent for the key elements of this scenario."[55]

Subsequent events since 1987 (in the Soviet Union, in Russia, and in Pakistan) have proven him right.[56] As will be seen, our study supports and bolsters these early conclusions. We draw lessons about the behavior of governments, institutions, and leaders regarding nuclear security and control of use during major political crises. Our project is useful for thinking in advance about the next major political crisis involving a nuclear-capable country such as Iran or North Korea; a mature nuclear power such as Pakistan, China, or Russia; or a future nuclear-capable state such as Saudi Arabia, Egypt, or Algeria. The project also brings insights to how to improve nuclear security and control of use.

It is tempting to say that organizations and procedures have, on balance, behaved fairly well throughout the nuclear age. After all, since 1945, there has never been either a nuclear explosion in anger, or a known transfer of an operational nuclear device. Perhaps political and military officials have taken better care of nuclear weapons than many have feared. There may have been progress—both through experience, information sharing, and improved technology—in the way nuclear arsenals have been controlled.

But one should guard against optimistic conclusions. The U.S. history of nuclear security over the past 2 decades, for instance, is less than stellar, even though the United States has the longest experience with and arguably the best know-how to deal with such issues. For example, in addition to the incidents listed above, the transcripts of the meeting that took place in the White House Situation Room immediately after President Reagan was shot in 1981 should give pause to optimists.[57] This would not come as a surprise to pessimistic organization theorists, who demonstrate that more technology does not necessarily mean more safety, and that effective learning from past incidents is very difficult, if not impossible.[58] Finally, nuclear security procedures and controls are only as strong as their weakest part, and, as in most other organizations, that is often the human element. This starts at the top. As U.S. expert Bruce Blair puts it, "No system of safeguards can reliably guard against misbehavior at the very apex of government."[59]

The history of the Cold War also shows that a few individuals, sometimes even one single person, stand between the risk of nuclear tragedy and return to normalcy. In April 1961, General Jean Thiry, the commander of the French nuclear testing grounds in the Sahara, decided to refuse to obey the rebels who had taken over Algiers and wanted him to give them control of a nuclear device that was ready to be tested.[60] On October 27, 1962, Vassili Arkhipov, a Soviet officer on board an attack submarine near Cuba, may have saved the world by refusing to launch a nuclear-tipped torpedo against U.S. forces. In November 1983, in the midst of acute Soviet paranoia about Western military intentions, NATO decided to tone down a major exercise entitled Able Archer-83, by taking out

the direct participation of high-ranking civilian and military U.S. officials. This may have been in response to warnings by a KGB double agent, Oleg Gordievsky, that some in Moscow believed a Western nuclear attack was imminent.[61] In August 1991, the chiefs of the three Soviet strategic services decided to cut off the coup leaders from the nuclear Command, Control, and Communications (C3) system in order to avoid any dangerous or reckless decisions.[62] Strategic Forces Commander General Y. P. Maksimov also decided to visibly lower the alert level of Soviet mobile missiles, allegedly in order to reassure Washington.[63]

Experience, wisdom, sound procedures, and technological improvements may have contributed to the absence of a nuclear explosion or to the transfer of nuclear weapons. But the absence of nuclear use cannot rely only on loyalty, cool-headedness, good management practices, and technical fixes. It is possible that, "To have so successfully prevented accidental nuclear explosions, tens of thousands of obscure soldiers must have taken much greater care than is taken in any other situation involving human agents and complex mechanical systems. To bypass every opportunity to buy or build nuclear weapons, hundreds of terrorist leaders must have shrunk from exploring those opportunities."[64] But even if that was true, are we willing to bet that it will continue to be the case for the next 60 years? We would do so at our own peril.

ENDNOTES - CHAPTER 1

1. On the risk of nuclear accidents and crises stemming from organizational issues and human failures, two pioneering studies are Bruce G. Blair, *The Logic of Accidental Nuclear War*, Washington, DC: Brookings Institution Press, 1991; and Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons*, Princeton, NJ: Princeton University Press, 1993.

2. According to the U.S. Department of Defense, "surety" includes safety, security, reliability, and control of use. See section 5.4.1 - DoD and DOE Safety Programs, "Chapter 5: Nuclear Safety and Security," in *The Nuclear Matters Handbook*, Expanded Version, available from w*ww.acq.osd.mil/ncbdp/nm/nm_book_5_11/chapter_5.htm*. Our project covers, broadly speaking, the second and fourth categories.

3. For a good summary of existing procedures in each country, see Hans Born *et al*., eds., *Governing the Bomb: Civilian and Democratic Accountability of Nuclear Weapons*, Oxford, UK: Oxford University Press, 2010.

4. Richard Rhodes, *The Twilight of the Bombs: Recent Challenges, New Dangers, and the Prospects of a World Without Nuclear Weapons*, New York: Alfred A. Knopf, 2010, p. 93.

5. Peter Vincent Pry, *War Scare: Russia and America on the Nuclear Brink*, Westport, CT: Praeger, 1999, pp. 85, 151; and J. Michael Waller, "Changing the Nuclear Command," *Insight on the News*, Vol. 17, No. 7, February 19, 2001.

6. Details on the exact Soviet command and control arrangements remain unclear. One account suggests that the General Secretary had the authority to order the use of nuclear weapons and that the actual execution of the order was subordinated to a direct command by the General Staff. David E. Hoffman, *The Dead Hand: The Untold Story of the Cold War Arms Race and Its Dangerous Legacy*, New York: Doubleday, 2009, p. 149. Another account states that the "permission command" (i.e., the political authorization) was intended to be formed jointly by the president, the minister of defense, and the chief of the general staff, but that the "direct command" could technically be given without such a permission command (though it required concurrent decisions by the general staff and the strategic rocket forces). See Blair, *The Logic of Accidental Nuclear War*, pp. 72, 86.

7. Alexei Arbatov, quoted in Pry, *War Scare*, p. 147.

8. Alexei Arbatov, "Russia," in Born *et al*., *Governing the Bomb*, pp. 73-74. See also Pry, *War Scare*, pp. 150-151; and Waller, "Changing the Nuclear Command."

9. Pry, *War Scare*, pp. 150-153.

10. Bates Gill and Evan S. Medeiros, "China," in Born *et al*., *Governing the Bomb*, pp. 147, 149-150.

11. This project applies only to nuclear weapons, not fissile materials stockpiles.

12. Peter D. Feaver, "Command and Control in Emerging Nuclear Nations," *International Security*, Vol. 17, Winter 1992-93.

13. The U.S. North American Air Defense (NORAD) command had the authority to fire nuclear weapons in combat without the specific approval of the president. In addition, most U.S. nuclear-armed air defense interceptors were single-seat aircraft, which precluded the implementation of the "two-man rule," the only existing security feature at the time, since PALs had not yet been introduced. In addition, SAC had the authority to launch a retaliatory strike after verifying that an enemy nuclear strike was under way in circumstances when the president was not available.

14. Peter Stein and Peter Feaver, *Assuring Control over Nuclear Weapons: The Evolution of Permissive Action Links*, Cambridge, MA: Center for Science and International Affairs, Harvard University, 1987.

15. Testimony of Admiral Sabbagh in Université de Franche-Comté, Institut Charles de Gaulle, ed., *L'Aventure de la Bombe: De Gaulle et la dissuasion nucléaire (The Adventure of the Bomb: De Gaulle and Nuclear Deterrence)*, Paris, France: Plon, 1984, p. 336.

16. The ability of Soviet SSBN commanders to fire their missiles without a coded input from a higher authority is disputed by Blair. See Blair, *The Logic of Accidental Nuclear War*, pp. 97-98, 160.

17. "British nukes protected by bicycle lock keys," BBC Press Release, November 15, 2007, available from *www.bbc.co.uk/pressoffice/pressreleases/stories/2007/11_november/15/newsnight.shtml*.

18. Sagan, *The Limits of Safety*, pp. 266-267. Reasons given include the fact that some new nuclear-capable nations would not be able to afford modern safety features; the weight and power of military services in some of these countries (an echo to Lewis Dunn's preoccupations mentioned above); and the existence of strong pressures to keep their nuclear arsenals on a high state of readiness (something that, however, did not materialize, as far as is known, for India and Pakistan).

19. Analysts suggest that this is due to two structural characteristics of many organizations' operating dangerous technologies: "interactive complexity" (which produces unanticipated failures); and, "tight-coupling" (which causes the failures to escalate out of control). See Sagan, *The Limits of Safety*.

20. This list includes neither nuclear weapons accidents per se (e.g., Palomares, 1966; Thule, 1968) nor false alarms created by purely technical "glitches," such as those that happened in the United States in June 1980 or in the Soviet Union in September 1983.

21. See Chap. 2 by Tertrais in this volume.

22. Sagan, *The Limits of Safety*, p. 99.

23. *Ibid*., pp. 130-131.

24. David H. Hackworth, "Hell in a Handbasket," *Maxim*, January 2001.

25. See Chap. 3 by Stokes in this volume.

26. *Ibid*.

27. John Wilson Lewis and Litai Xue, *Imagined Enemies: China Prepares for Uncertain War*, Stanford, CA: Stanford University Press, 2008, pp. 176-178.

28. *China Builds the Bomb*, Stanford, CA: Stanford University Press, 1988, pp. 201-205.

29. Leonard S. Spector, *Going Nuclear*, Cambridge MA: Ballinger, 1987, pp. 32-37.

30. Hoffman, *The Dead Hand*, p. 381; Philip Taubman, *The Partnership: Five Cold Warriors and Their Quest to Ban the Bomb*, New York: Harper, 2012, p. 200.

31. Bruce G. Blair, "Keeping Presidents in the Nuclear Dark (Episode #1: The Case of the Missing Permissive Action Links)," *Bruce Blair's Nuclear Column,* Center for Defense Information, February 11, 2004.

32. Sagan, *The Limits of Safety*, pp. 228-230.

33. Blair, "Keeping Presidents in the Nuclear Dark."

34. Jacques Séguéla, "La clé atomique" ("The Atomic Key"), *Le Nouvel Observateur (The New Observer*), January 5-11, 2006; Victoria Gairin, "Derrière les murs du Château" ("Behind the Walls of the Castle"), *Le Point*, March 29, 2012. The same misadventure reportedly happened to U.S. President Jimmy Carter, whose suit did go to the dry cleaner. Hackworth, "Hell in a Handbasket."

35. See Chap. 5 by Khan in this volume.

36. Andrew and Leslie Cockburn, *One Point Safe*, New York: Doubleday, 1997, pp. 9-12.

37. See Chap. 4 by Sokov in this volume.

38. *Ibid*.; and Pry, *War Scare*, p. 113.

39. Arbatov, "Russia," p. 74.

40. Pry, *War Scare*, p. 85; and Jonathan Stevenson, *Thinking Beyond the Unthinkable: Harnessing Doom From the Cold War to the Age of Freedom*, New York: Viking, 2008, p. 205.

41. See Chap. 4 by Sokov in this volume. See also William Potter, "Ukraine's Nuclear Trigger," *The New York Times*, November 10, 1992.

42. Pry, *War Scare*, p. 197.

43. *Ibid*., pp. 175-176.

44. Arbatov, "Russia," p. 59; Pry, *War Scare*, pp. 217-218, 224, 234.

45. Pry, *War Scare*, pp. 218-230.

46. *Ibid*., pp. 196-197.

47. Hackworth, "Hell in a Handbasket." The author mentions several other episodes of accidental or deliberate separations between the President and the "football."

48. John Donvan, "President Bill Clinton Lost Nuclear Codes While in Office, New Book Claims," *ABC News*, October 20, 2010.

49. Shaun Gregory, "The Terrorist Threat to Pakistan's Nuclear Weapons," *CTC Sentinel*, Vol. 2, No. 7, 2009; "Terrorist Tactics Threaten Nuclear Weapons Safety," *CTC Sentinel*, Vol. 4, No. 6, 2011.

50. Hans M. Kristensen, "U.S. Nuclear Weapons Site in Europe Breached," *FAS Strategic Security Blog*, February 4, 2010.

51. Lewis A. Dunn, "Military Politics, Nuclear Proliferation, and the 'Nuclear Coup d'Etat,'" *The Journal of Strategic Studies*, Vol. 1, No. 1, May 1978.

52. *Ibid*., p. 46.

53. Spector, *Going Nuclear*.

54. For instance, the Pakistani study does not cover the sale or transfer of Pakistani weapons designs.

55. Spector, *Going Nuclear*, p. 58.

56. Spector also wondered about the fate of the South African nuclear program when the apartheid would collapse. See *Ibid*., p. 59.

57. See Richard V. Allen, "The Day Reagan Was Shot," *Hoover Digest*, No. 3, July 30, 2001.

58. See Sagan, *The Limits of Safety*, pp. 207-210.

59. Quoted in Rhodes, *Twilight of the Bombs*, p. 95.

60. See Chap. 2 by Tertrais in this volume.

61. There is no certainty about the role that Gordievsky may have played. See Benjamin B. Fischer, *A Cold War Conundrum: The 1983 Soviet War Scare*, Washington, DC: Central Intelligence Agency, July 7, 2008; Pry, *War Scare*, p. 38.

62. Mikhail Tsypkin, "Adventures of the 'Nuclear Briefcase': A Russian Document Analysis," *Strategic Insights*, Vol. III, Issue 9, September 2004.

63. Rhodes, *Twilight of the Bombs*, p. 94. It should be noted that there are diverging views about the role of Maksimov. Pry argues that the missiles were in fact recalled to the garrison in order to ensure that their crews could be directly supervised, at a time when the coup leaders had put the Soviet nuclear forces on alert even before declaring a new government. See *War Scare*, p. 83, 156.

64. Theodore Caplow, *Armageddon Postponed: A Different View of Nuclear Weapons*, Lanham, MD: Hamilton Books, 2010, p. 38.