

“Nuclear South Asia: A Guide to India, Pakistan, and the Bomb”

Glossary

Agreement on Non-Attack of Nuclear Facilities: An agreement signed by India and Pakistan in December 1988 that banned attacks on “[w]orks or installations containing dangerous forces,” such as dams and nuclear power reactors, that could pose a threat to civilian populations.¹ It was implemented in 1991 and requires an annual exchange of lists identifying the location of nuclear-related facilities.

Agreement on Prior Notification of Military Exercises: An agreement between India and Pakistan finalized in April 1991 requiring each side to notify the other when carrying out exercises comprising two or more divisions in specified locations and those near the Line of Control involving division level or above.² Troop maneuvers directed toward the international border are proscribed and no military activity is permitted within five kilometers of the border.

Agreement on Reducing the Risk from Accidents Relating to Nuclear Weapons: An agreement between India and Pakistan that was finalized in February 2007, reaffirmed in February 2012, and extended once again for a five-year term in February 2017. Both sides pledged to notify each other in the event of an accident involving nuclear weapons.³

A.Q. Khan Network: A non-state proliferation network managed by Pakistani scientist Abdul Qadeer Khan that facilitated the illicit transfer of nuclear equipment, enrichment technology, and warhead designs to countries seeking to advance their nuclear programs, including Iran, North Korea, and Libya.⁴

Atomic Energy Act (AEA): The foundational U.S. law for regulating, developing, and disposing nuclear materials and facilities, passed in 1946 and significantly amended in 1954.⁵ The law relates to both civilian and military uses of nuclear materials and established the Atomic Energy Commission, which oversees peacetime development of nuclear technology.

Atoms for Peace: A program initiated by U.S. President Dwight D. Eisenhower in 1953 that provided the requisite technology and educational resources to countries pursuing civilian nuclear energy.⁶

¹ “India-Pakistan Non-Attack Agreement,” Nuclear Threat Initiative, October 26, 2011, <http://www.nti.org/learn/treaties-and-regimes/india-pakistan-non-attack-agreement/>.

² “India and Pakistan: Agreement on Advance Notice on Military Exercises, Manoeuvres and Troop Movements” (United Nations Treaty Collection, April 6, 1991), <https://treaties.un.org/doc/publication/unts/volume%201843/volume-1843-i-31420-english.pdf>.

³ “Agreement On Reducing The Risk From Accidents Relating To Nuclear Weapons” (Stimson Center, February 21, 2007), <https://www.stimson.org/agreement-on-reducing-the-risk-from-accidents-relating-to-nuclear-weap>.

⁴ Christopher Clary, “The A.Q. Khan Network: Causes and Implications.” Master's Thesis. Naval Postgraduate School, 2005. <https://fas.org/irp/eprint/clary.pdf>.

⁵ “Nuclear Regulatory Legislation 112th Congress; 2nd Session,” NUREG-0980 (Washington, DC: United States Nuclear Regulatory Commission, September 2013).

⁶ Dwight Eisenhower, “Atoms for Peace Speech,” Text, International Atomic Energy Agency, December 8, 1953, <https://www.iaea.org/about/history/atoms-for-peace-speech>.

Ballistic Missile Defense (BMD): A defense system designed to track and destroy ballistic missiles before they reach their intended target. BMD systems are designed to launch rockets to intercept re-entry vehicles (carrying warheads) and explode, destroying the missiles in the air.⁷

Ballistic Missile Flight-Test Pre-Notification Agreement: An agreement signed by India and Pakistan in October 2005 to notify each other prior to testing “any land or sea launched, surface-to-surface ballistic missiles.”⁸ One limitation of the pre-notification agreement is that it covers only surface-to-surface ballistic missile flight-tests, not those of cruise missiles.

Brasstacks Crisis: A crisis between India and Pakistan in 1986-87 triggered by Operation Brasstacks, which was a multi-phase exercise conducted by the Indian military.⁹ The exercise’s final phase, which began in November 1986, took place in Rajasthan, which borders Pakistan’s Sindh province. The Pakistan Army was also engaged in military exercises at the time of the crisis. Since Indian intentions were uncertain, Pakistani commanders decided to keep their corps deployed in their exercise areas until the crisis subsided. The spiral to war was stopped when Indian Prime Minister Rajiv Gandhi became cognizant of rising dangers and intervened to re-impose civilian control over defense matters. India and Pakistan agreed in January 1987 to enter negotiations to de-escalate tensions at the border.

Catalytic Nuclear Posture: The posture assumed by a state when it has a limited or unassembled nuclear arsenal, but uses that arsenal to coerce a third party, instead of an adversary, to intervene on its behalf. Under this posture, nuclear use is considered “only as a last resort” when the state’s existence is threatened.¹⁰

Civil Liability for Nuclear Damage Act: An act passed by the Indian Parliament in 2010 that provides civil liability for potential nuclear-related damages.¹¹ It was a final step in solidifying the Indo-U.S. civil nuclear deal and allowed India to join the Vienna Convention on Civil Liability Damage.

Civilian Nuclear Program: A nuclear program geared towards harnessing nuclear power for peaceful purposes, including supplying energy to civilian and commercial uses and conducting scientific research.

Cold Start Doctrine: The Indian Army’s limited war doctrine, which calls for the reorganization of its large strike corps into smaller integrated battle groups to facilitate the rapid mobilization of forces along the India-Pakistan border for a conventional retaliatory strike on Pakistan.¹² Under Cold Start, the Indian Army would make shallow incursions into Pakistani territory and use captured territory as leverage to

⁷ “How Does Missile Defense Work?,” Union of Concerned Scientists, accessed May 4, 2018, <https://www.ucsusa.org/nuclear-weapons/missile-defense/how-gmd-missile-defense-works>.

⁸ “Agreement Between India And Pakistan On Pre-Notification Of Flight Testing Of Ballistic Missiles,” Stimson Center, October 24, 2012, <https://www.stimson.org/agreement-between-india-and-pakistan-on-pre-notification-of-flight-tes>.

⁹ P. R. Chari, Pervaiz Iqbal Cheema, and Stephen P. Cohen, *Four Crises and a Peace Process: American Engagement in South Asia* (Washington, DC: Brookings Institution Press, 2009).

¹⁰ Vipin Narang, *Nuclear Strategy in the Modern Era: Regional Powers and International Conflict* (Princeton, NJ: Princeton University Press, 2014).

¹¹ “Frequently Asked Questions and Answers on Civil Liability for Nuclear Damage Act 2010 and Related Issues,” Government of India: Ministry of External Affairs, February 8, 2015, http://www.mea.gov.in/press-releases.htm?dtl/24766/Frequently_Asked_Questions_and_Answers_on_Civil_Liability_for_Nuclear_Damage_Act_2010_and_related_issues.

¹² Walter C. Ladwig III, “A Cold Start for Hot Wars?,” *International Security* 32, no. 2 (Winter 2007): 158–90.

compel Pakistan to cease its support to anti-India militants.¹³ Proponents of Cold Start insist that it could be implemented without triggering Pakistan’s nuclear thresholds, though Pakistan vows to respond with the use of tactical nuclear weapons under its doctrine of full-spectrum deterrence.¹⁴

Compound Crisis: A crisis between India and Pakistan that began in February 1990 and lasted until June 1990. A series of events precipitated this crisis, and many scholars have termed events in 1990 a “compound” crisis in recognition of the complex interplay of factors that contributed to its onset.¹⁵ Elements including unrest in the Kashmir Valley and Indian Punjab, Pakistani and Indian military exercises, and domestic politics contributed to the unraveling of the crisis. The United States served as a crisis manager and sought to dampen prospects for escalation.

Comprehensive Nuclear Test-Ban Treaty (CTBT): An international treaty adopted by the UN General Assembly in 1996 that prohibits the testing of all nuclear explosives.¹⁶ As of 2017, 166 countries have ratified the treaty. While China and the United States have signed the treaty, they have not ratified it. India and Pakistan have neither signed nor ratified the treaty.

Confidence-Building Measures (CBMs): Diverse arrangements—such as hotlines, people-to-people exchanges, and prior notifications of military exercises—that can help reduce tensions and promote good relations.¹⁷

Counterforce Targeting: The threat to use nuclear weapons to destroy military targets. Counterforce targeting requires many nuclear weapons of varied ranges, including weapons with high accuracy, to strike military targets.¹⁸ By engaging in counterforce targeting, national leaders seek to underscore the risks to an adversary of crossing the nuclear threshold, as well as a belief that once this threshold is crossed, nuclear weapons have military utility.

Countervalue Targeting: The threat to use nuclear weapons to destroy cities. Leaders in states that rely on countervalue targeting believe that nuclear weapons have political, but not military, value.¹⁹

¹³ George Perkovich and Toby Dalton, *Not War, Not Peace?: Motivating Pakistan to Prevent Cross-Border Terrorism* (New Delhi: Oxford University Press, 2016).

¹⁴ Naeem Salik, “Pakistan’s Nuclear Force Structure in 2025,” Carnegie Endowment for International Peace, June 30, 2016, <https://carnegieendowment.org/2016/06/30/pakistan-s-nuclear-force-structure-in-2025-pub-63912>.

¹⁵ Chari, Cheema, and Cohen, *Four Crises and a Peace Process*.

¹⁶ “The Treaty - History: Summary,” CTBTO Preparatory Commission, accessed May 7, 2018, <https://www.ctbto.org/the-treaty/history-summary/>.

¹⁷ P. R. Chari, “CBMs in Post-Cold War South Asia,” Stimson Center, June 14, 2012, <https://www.stimson.org/cbms-in-post-cold-war-south-asia>. Also see: Michael Krepon, “South Asia Confidence-Building Measures (CBM) Timeline,” Stimson Center, April 14, 2017, <https://www.stimson.org/content/south-asia-confidence-building-measures-cbm-timeline>.

¹⁸ Michael Krepon, Travis Wheeler, and Shane Mason, eds., *The Lure and Pitfalls of MIRVs: From the First to the Second Nuclear Age* (Washington, DC: Stimson Center, 2016), https://www.stimson.org/sites/default/files/file-attachments/Lure_and_Pitfalls_of_MIRVs.pdf.

¹⁹ Hans M. Kristensen, Robert S. Norris, and Ivan Oelrich, “From Counterforce to Minimal Deterrence: A New Nuclear Policy on the Path Toward Eliminating Nuclear Weapons,” Occasional Paper (Washington, DC: Federation of American Scientists and the Natural Resources Defense Council, April 2009).

Credible Minimum Deterrence: The posture of maintaining nuclear weapons at the minimal level necessary to deter nuclear threats against oneself.²⁰ Whereas some observers emphasize the “minimum” aspect, others emphasize the “credible” aspect.²¹ The “minimum” camp tends to view credible minimum deterrence as implying a commitment to a small nuclear arsenal and the avoidance of arms racing.²² The “credible” camp holds that states should pursue whichever capabilities make deterrence credible regardless of their effect on arsenal size or competitive dynamics.

Crisis Management: The attempt to defuse a crisis through communication, confidence-building measures, or other reassuring actions.²³ This may take place on the initiative of the two potential combatants, or a third party may intervene to broker a solution and de-escalate the crisis.

Crisis Stability: States’ ability to contain hostilities and prevent escalation to full-scale military conflict during a crisis.²⁴ If both sides have successfully demonstrated credible deterrence then the prospects for stable relations in a crisis may improve due to fear of retaliation from the other. If one side believes that it has an offensive advantage or that its adversary lacks a credible deterrent, then a crisis may provide cause for aggression, and war could start.

Deterrence: A form of coercion in which an actor seeks to prevent an adversary from taking a particular action through fear of consequences.²⁵ In the nuclear context, this mainly refers to dissuading adversaries from attacking one’s territory through the threat of nuclear retaliation.

Deterrence Optimism: The belief that nuclear weapons can increase stability and peace between nuclear powers.²⁶

Deterrence Pessimism: The doubt of nuclear weapons’ ability to increase stability and peace between nuclear powers.²⁷

Deterrence Stability: A stable environment in relations between states where the prospect of mutually assured destruction deters conflict between nuclear-armed adversaries.²⁸ The mutual attainment of

²⁰ Rajesh Rajagopalan, “India’s Nuclear Doctrine Debate,” Carnegie Endowment for International Peace, June 30, 2016, <http://carnegieendowment.org/2016/06/30/india-s-nuclear-doctrine-debate-pub-63950>.

²¹ Vipin Narang, “Five Myths about India’s Nuclear Posture,” *The Washington Quarterly* 36, no. 3 (August 2013): 143–57.

²² Nishant Rajeev, “A Holistic Approach to India’s Nuclear Doctrine,” *The Diplomat*, May 24, 2017, <https://thediplomat.com/2017/05/a-holistic-approach-to-indias-nuclear-doctrine/>.

²³ Polly Nayak and Michael Krepon, “U.S. Crisis Management in South Asia’s Twin Peaks Crisis” (Washington, DC: Stimson Center, September 2006), https://www.stimson.org/sites/default/files/file-attachments/Twin_Peaks_Crisis.pdf.

²⁴ James M. Acton, “Reclaiming Strategic Stability,” in *Strategic Stability: Contending Interpretations*, ed. Elbridge A. Colby and Michael S. Gerson (Strategic Studies Institute, US Army War College, 2013), 117–46, <http://carnegieendowment.org/2013/02/05/reclaiming-strategic-stability-pub-51032>.

²⁵ Thomas C. Schelling, *Arms and Influence: With a New Preface and Afterword* (New Haven: Yale University Press, 2008).

²⁶ Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: An Enduring Debate* (New York: W.W. Norton & Company, 2013).

²⁷ Ibid.

²⁸ Michael Krepon and Julia Thompson, eds., *Deterrence Stability and Escalation Control in South Asia* (Washington, DC: Stimson Center, 2013), http://www.stimson.org/images/uploads/research-pdfs/Deterrence_Stability_Dec_2013_web.pdf.

secure second-strike capabilities between adversaries has arguably had a revolutionary effect on international relations, reducing the likelihood of highly destructive, direct war.²⁹

Disarmament: Steps taken by a nuclear-weapons state to reduce or eliminate its nuclear arsenal. The five countries recognized as nuclear-weapons states by the Nuclear Non-Proliferation Treaty made commitments under Article VI to “pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race at an early date and to nuclear disarmament.”³⁰

Dual-Capable Missile: A missile that can carry either nuclear or conventional warheads.

Escalation Control: A concept that imagines several levels of conflict, from the conventional to the nuclear level, wherein states can prevent hostilities from intensifying to higher levels of conflict.³¹ Controlling escalation “is an exercise in deterrence” in that it requires confining an adversary’s actions below its capabilities before the outbreak of war.³²

Fissile Material Cut-Off Treaty (FMCT): A proposed international agreement that would ban the production of highly enriched uranium and plutonium. The treaty has not been negotiated nor finalized by the Conference on Disarmament, which acts as the international authority of multilateral disarmament efforts.³³

Full-Spectrum Deterrence (FSD): Pakistan’s nuclear doctrine, which was adopted to deter India not only from strategic use of nuclear weapons, but conventional war against Pakistan.³⁴ FSD is a “kind of deterrence by denial, more akin to flexible response or graduated response doctrines” and therefore requires a “larger arsenal size and a greater variety of both warheads and delivery systems” for countervalue and counterforce targeting.³⁵

Glenn Amendment: U.S. legislation enacted in 1977 that empowers the U.S. president to impose broad sanctions on non-Nuclear Non-Proliferation Treaty nuclear powers for conducting nuclear tests.³⁶ These sanctions were applied to India and Pakistan after their 1998 nuclear tests, but fully waived following the 9/11 attacks.³⁷

²⁹ Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca, NY: Cornell University Press, 1989).

³⁰ “Nuclear Disarmament Resource Collection,” Nuclear Threat Initiative, April 3, 2017, <http://www.nti.org/analysis/reports/nuclear-disarmament/>.

³¹ Michael Krepon, Rodney W Jones, and Ziad Haider, eds., *Escalation Control and the Nuclear Option in South Asia* (Washington, D.C.: Stimson Center, 2004), https://www.stimson.org/sites/default/files/file-attachments/Escalation%20Control%20FINAL_0.pdf.

³² Bernard Brodie, *Escalation and the Nuclear Option* (Princeton, NJ: Princeton University Press, 1966).

³³ “Proposed Fissile Material (Cut-Off) Treaty (FMCT),” Nuclear Threat Initiative, May 31, 2017, <http://www.nti.org/learn/treaties-and-regimes/proposed-fissile-material-cut-off-treaty/>.

³⁴ “A Conversation with Gen. Khalid Kidwai,” Carnegie International Nuclear Policy Conference, moderated by Peter Lavoy, March 23, 2015, <https://carnegieendowment.org/files/03-230315carnegieKIDWAI.pdf>.

³⁵ Salik, “Pakistan’s Nuclear Force Structure in 2025.”

³⁶ Robert M. Hathaway, “Confrontation and Retreat: The U.S. Congress and the South Asian Nuclear Tests - Key Legislation,” Arms Control Association, January 1, 2000, https://www.armscontrol.org/act/2000_01-02/rhchart.

³⁷ Alex Wagner, “Bush Waives Nuclear-Related Sanctions on India, Pakistan,” October 1, 2001, https://www.armscontrol.org/act/2001_10/sanctionsoct01.

Global Nuclear Order: The “arrangement of states and institutions in the international system based on beliefs about the relationship between nuclear technology and international political power,” defining nuclear haves and have-nots.³⁸

Horizontal Proliferation: The spread of nuclear weapons from nuclear states to non-nuclear states or non-state actors.³⁹

Hyde Act: An amendment to the Atomic Energy Act, which allowed the U.S. to conclude the “123 Agreement” and exempt some requirements of the AEA to commence nuclear cooperation with India.⁴⁰

International Atomic Energy Agency (IAEA): An international regulatory body established in 1957 as part of the United Nations family to promote the safe, secure, and peaceful use of nuclear technologies.⁴¹

Kargil Conflict: A conflict, or limited war, between India and Pakistan that took place with intense fighting between May and July of 1999.⁴² It was triggered by the infiltration in the winter of 1998 of an estimated 1,500-2000 Pakistani troops of the Northern Light Infantry across the Line of Control into Kargil. Following involvement by the United States as a crisis manager, Pakistan ultimately withdrew from Kargil, resulting in a return to the status quo ante. The Kargil conflict is often cited as the only instance of direct warfare between nuclear-armed states, though the significance of the nuclear factor during the conflict is debated by scholars.

Lahore Process: A summit between Indian and Pakistan leaders in 1999 in Lahore that resulted in the Lahore Declaration.⁴³ The resulting memorandum of understanding affirmed a commitment to increasing an atmosphere of peace and security.

Multiple Independently Targetable Re-entry Vehicle (MIRV): A missile that carries multiple warheads, each of which can be directed to a different target.⁴⁴

Mumbai Crisis: A crisis between India and Pakistan that was triggered by the terrorist attacks in India in November 2008.⁴⁵ Several terrorists landed in Mumbai and scattered to soft targets across the city, launching simultaneous attacks that held India’s financial capital under siege for days and killing more than 170 individuals, including six American citizens. An escalatory spiral between India and Pakistan

³⁸ Toby Dalton, Togzhan Kassenova, and Lauryn Williams, eds., *Perspectives on the Evolving Nuclear Order* (Washington, DC: Carnegie Endowment for International Peace), accessed May 7, 2018, <https://carnegieendowment.org/2016/06/06/perspectives-on-evolving-nuclear-order-pub-63711>.

³⁹ Sharad Joshi, “Nuclear Proliferation and South Asia: Recent Trends,” Nuclear Threat Initiative, August 1, 2007, <http://www.nti.org/analysis/articles/nuclear-proliferation-south-asia/>.

⁴⁰ “Hyde Act,” U.S. Government Publishing Office, accessed May 7, 2018, <https://www.gpo.gov/fdsys/pkg/BILLS-109hr5682enr/pdf/BILLS-109hr5682enr.pdf>.

⁴¹ “History,” International Atomic Energy Agency, accessed May 7, 2018, <https://www.iaea.org/about/overview/history>.

⁴² Peter René Lavoy, *Asymmetric Warfare in South Asia: The Causes and Consequences of the Kargil Conflict* (New York: Cambridge University Press, 2009).

⁴³ Chari, Cheema, and Cohen, *Four Crises and a Peace Process*.

⁴⁴ Krepon, Wheeler, and Mason, *The Lure and Pitfalls of MIRVs: From the First to the Second Nuclear Age*.

⁴⁵ Polly Nayak and Michael Krepon, “The Unfinished Crisis: US Crisis Management after the 2008 Mumbai Attacks” (Washington, DC: Stimson Center, February 2012), http://www.stimson.org/images/uploads/research-pdfs/Mumbai-Final_1.pdf.

seemed imminent, as the militants were affiliated with Lashkar-e-Taiba, a group alleged to have ties to Pakistan’s military and intelligence service. The Mumbai crisis entailed policy coordination among U.S. officials in multiple layers of government and diverse locales. It marked the latest in a procession of crises that continued despite the advent of overt nuclear weapon capabilities.

No First Use (NFU): A policy whereby a nuclear power pledges to only use nuclear weapons in retaliation and that it will not be the first user of nuclear weapons in a conflict.⁴⁶

Nuclear Command and Control (C&C): The interlocking series of institutional arrangements, operational procedures, and technical mechanisms that could provide leaders with the means to manage and employ nuclear forces as well as prevent their unauthorized or accidental use.⁴⁷

Nuclear Fuel Cycle: The infrastructure and chemistry that allow a country to turn uranium into energy and/or nuclear weapons.⁴⁸

Nuclear Non-Proliferation Treaty (NPT): An international treaty established in 1968 with the goals of preventing the spread of nuclear weapons and technology, advancing disarmament, and promoting peaceful uses of nuclear energy.⁴⁹ As of 2017, all countries except India, Israel, North Korea, Pakistan, and South Sudan are party to the treaty.

Nuclear Policy: How leaders in states that possess nuclear weapons view the utility of these weapons and the plausible conditions under which their use might be envisioned.⁵⁰

Nuclear Proliferation: The spread of nuclear weapons, fissile material, and/or technology to countries besides the five recognized by the Nuclear Non-Proliferation Treaty as nuclear-weapon states, or the increase in an existing nuclear-weapons state’s arsenal size or technological standard.⁵¹

Nuclear Risk-Reduction Measures (NRRMs): Confidence-building measures that are specific to reducing nuclear dangers.⁵²

Nuclear Substitution: The idea that nuclear weapons, especially second-strike capabilities, decrease a state’s need for pursuing upgrades in conventional forces.⁵³

⁴⁶ Rajagopalan, “India’s Nuclear Doctrine Debate.”

⁴⁷ Peter D. Feaver, “Command and Control in Emerging Nuclear Nations,” *International Security* 17, no. 3 (Winter 1992/93): 160–87.

⁴⁸ “The Nuclear Fuel Cycle,” International Atomic Energy Agency, August 2011, <https://www.iaea.org/sites/default/files/nfc0811.pdf>.

⁴⁹ “Treaty on the Non-Proliferation of Nuclear Weapons (NPT),” Nuclear Threat Initiative, April 15, 2018, <http://www.nti.org/learn/treaties-and-regimes/treaty-on-the-non-proliferation-of-nuclear-weapons/>.

⁵⁰ “Backgrounder: Nuclear Policy and Posture,” *Nuclear South Asia: A Guide to India, Pakistan, and the Bomb*, accessed May 7, 2018, <https://www.nuclearlearning.org/courses/take/nuclear-south-asia/texts/1245471-backgrounder-nuclear-policy-and-posture>.

⁵¹ “Treaty on the Non-Proliferation of Nuclear Weapons (NPT).”

⁵² W.P.S. Sidhu et al., “Nuclear Risk-Reduction Measures in Southern Asia” (Washington, DC: Stimson Center, November 1998), <https://www.stimson.org/sites/default/files/file-attachments/Report%20No.%2026%20November%201998.pdf>.

⁵³ Ahsan I. Butt, “Do Nuclear Weapons Affect the Guns-Butter Trade-off? Evidence on Nuclear Substitution from Pakistan and Beyond,” *Conflict, Security & Development* 15, no. 3 (May 27, 2015): 229–57.

Nuclear Suppliers Group (NSG): A “supply-side” regime of countries who pledge to set strict guidelines for nuclear-technology exports and nuclear-related exports to curb proliferation.⁵⁴ The organization was founded in 1974 in response to India’s first nuclear test, which it dubbed a “peaceful nuclear explosion.”⁵⁵

Nuclear Taboo: The non-use of nuclear weapons since World War II due to their normative status as prohibited weapons.⁵⁶

Nuclear Terrorism: The acquisition and use of nuclear weapons by violent non-state actors.⁵⁷

Nuclear Triad: The ability to employ nuclear weapons by land-, air-, and sea-based delivery systems.⁵⁸

“Peaceful Nuclear Explosion” (PNE): The term used by the Indian government to describe its first nuclear test in 1974.⁵⁹ Despite international doubts, New Delhi insisted the test was for civilian, rather than military, purposes.

Pressler Amendment: U.S. legislation enacted in 1985 that threatened to heavily restrict aid to Pakistan unless the U.S. president annually certified that Pakistan neither had nor was developing a nuclear device.⁶⁰ This was used in 1990 to impose sanctions on Pakistan, representing a loss of about \$300 million per year in arms and other military supplies for the Pakistani state, but the sanctions were waived after 9/11.⁶¹

Solarz Amendment: U.S. legislation enacted in 1985 that cut off aid to non-Nuclear Non-Proliferation Treaty states for illegally exporting or attempting to export nuclear materials or technology from the United States.⁶²

Symington Amendment: U.S. legislation enacted in 1976 that cut off most aid to countries determined to be trafficking nuclear-enrichment equipment or technology outside of international safeguards.⁶³ These sanctions were applied to Pakistan in 1979, but lifted after 9/11.⁶⁴

⁵⁴ “Nuclear Suppliers Group (NSG),” Nuclear Threat Initiative, February 1, 2018, <http://www.nti.org/learn/treaties-and-regimes/nuclear-suppliers-group-nsg/>.

⁵⁵ “18 May 1974 - Smiling Buddha,” CTBTO Preparatory Commission, accessed May 7, 2018, <https://www.ctbto.org/specials/testing-times/18-may-1974-smiling-buddha>.

⁵⁶ Nina Tannenwald, *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945* (New York: Cambridge University Press, 2007).

⁵⁷ “Nuclear & Radiological Terrorism,” Federation of American Scientists, accessed May 7, 2018, <https://fas.org/issues/nuclear-and-radiological-terrorism/>.

⁵⁸ “Fact Sheet: The Nuclear Triad,” Center for Arms Control and Non-Proliferation, July 28, 2017, <https://armscontrolcenter.org/factsheet-the-nuclear-triad/>.

⁵⁹ “18 May 1974 - Smiling Buddha.”

⁶⁰ Hathaway, “Confrontation and Retreat: The U.S. Congress and the South Asian Nuclear Tests - Key Legislation.”

⁶¹ Dennis Kux, *The United States and Pakistan, 1947-2000: Disenchanted Allies* (Washington, DC: Woodrow Wilson Center Press, 2001). Also see: Wagner, “Bush Waives Nuclear-Related Sanctions on India, Pakistan.”

⁶² Richard T. Cupitt, *Reluctant Champions: U.S. Presidential Policy and Strategic Export Controls, Truman, Eisenhower, Bush and Clinton* (New York: Routledge, 2002).

⁶³ Hathaway, “Confrontation and Retreat: The U.S. Congress and the South Asian Nuclear Tests - Key Legislation.”

⁶⁴ Wagner, “Bush Waives Nuclear-Related Sanctions on India, Pakistan.”

Tactical Nuclear Weapons: Low-yield, short-range nuclear devices used on the battlefield rather than against a strategic target, such as a city.⁶⁵

Technological Determinism: In the nuclear-weapons context, the development of more advanced weapons capabilities without regard to political motivations or strategic consequences.⁶⁶

Twin Peaks Crisis: A crisis between India and Pakistan that had two major peaks between December 2001 and October 2002.⁶⁷ For those ten months, India and Pakistan kept approximately one million soldiers in a high state of readiness along their international border and the Line of Control dividing Kashmir, raising the specter of conflict. The immediate trigger for deployment was an attack by militants on the Indian Parliament in December 2001. The attack set in motion an extended crisis with two distinct peaks during which tensions were extremely high.⁶⁸ The first peak, immediately after the attack on Parliament, occurred from December 2001-January 2002. The second peak, in May-June 2002, followed another high-profile attack by militants, near the town of Kaluchak in Jammu. During both peaks, high-level U.S. officials were involved in crisis management, seeking the return of Indian and Pakistani forces to their cantonments.

U.S.-India Civil Nuclear Agreement (Indo-U.S. Nuclear Deal): An agreement between the United States and India concluded in 2008 that established civil nuclear cooperation between the two countries.⁶⁹ As part of the deal, the Nuclear Suppliers Group granted India a waiver, allowing it to engage in civilian nuclear trade with the United States and the group's other members. In return, India allowed more intrusive inspections of its civilian nuclear facilities and promised to continue its moratorium on testing and to work towards negotiating a Fissile Material Cut-Off Treaty.

Vertical Proliferation: The proliferation of nuclear weapons by a country increasing its own stockpile and/or modernizing its own technology.⁷⁰

⁶⁵ Nikolai Sokov, "Tactical Nuclear Weapons (TNW)," Nuclear Threat Initiative, May 1, 2002, <http://www.nti.org/analysis/articles/tactical-nuclear-weapons/>.

⁶⁶ Narang, *Nuclear Strategy in the Modern Era*.

⁶⁷ Nayak and Krepon, "U.S. Crisis Management in South Asia's Twin Peaks Crisis."

⁶⁸ Steve Coll, "The Stand-Off," *The New Yorker*, February 6, 2006, <https://www.newyorker.com/magazine/2006/02/13/the-stand-off>.

⁶⁹ Jayshree Bajoria and Esther Pan, "The U.S.-India Nuclear Deal," Council on Foreign Relations, November 5, 2010, <https://www.cfr.org/backgrounders/us-india-nuclear-deal>.

⁷⁰ Joshi, "Nuclear Proliferation and South Asia."