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The linkage between regional and global nuclear orders

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Global Nuclear Orders and the Asia–Pacific

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International politics is a struggle for normative ascendancy: the establishment and maintenance of the dominant normative architecture of international order created and maintained by the interplay of power, ideas and values. Power and principles intersect also on nuclear politics and the Nuclear Non-Proliferation Treaty (NPT), signed in 1968 and in force since 1970, is as good an illustration as any other normative anchor of the international order. At the idealistic end of the spectrum, the anti-nuclear norm was made legally binding, immediate and enforceable in the non-proliferation obligations of the NPT. But, in a concession to political reality, the demand for nuclear disarmament by the five NPT-licit (N5) nuclear weapons sates (NWS) was softened to the point of being meaningless in practice.

Asia is of course the only continent where nuclear weapons have ever been used. Four of the nine countries that currently possess nuclear weapons (China, France, India, Israel, North Korea, Pakistan, Russia, UK and US) are in Asia, including three of the four non-NPT states. The NPT is the normative anchor of the global nuclear orders on disarmament, non-proliferation, safety and security. Asia – and only Asia – contains states with the full spectrum of nuclear weapons status in relation to the NPT: a NWS, two non-NPT nuclear armed states,[2] an NPT defector state, three umbrella states; and a vast majority of non-NWS states parties to the NPT. Not surprisingly, therefore, nuclear risks and threats that exist globally are also present in Asia, in some cases in more acute form. It is also worth remembering that security complexes and the main drivers of nuclear weapons policy tend to be primarily regional – and indeed, in Asia–Pacific, subregional[3] – rather than global, although obviously there are cross-linkages between these two and the national levels of analyses. While the major normative orders for

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2 The NPT's arbitrary chronological definition of a NWS restricts that status to countries that conducted nuclear tests before 1 January 1967 (the five NWS). It is possible to work around the legal restriction by describing any country that possesses nuclear weapons as a nuclear-armed state.

3 Moreover, the subregional nuclear insecurity complex across Asia does not always coincide with the geographical subregion. For example in the subcontinent, there is a triangular nuclear relationship between China, India and Pakistan. The other South Asian states are largely irrelevant to the core dynamics of the nuclear equation, although they would be severely impacted with any use of nuclear weapons and with a nuclear accident. By contrast, in Northeast Asia every country is part of the nuclear equations complex; and in Southeast Asia and Oceania, no country has or is likely to seek nuclear weapons in the foreseeable future, although Australia is a nuclear umbrella country; some Southeast Asian countries are interested in nuclear power but Oceania is entirely free of nuclear power reactors; and both subregions are covered by nuclear-weapon-free zones.

regulating the possession, testing and use of nuclear weapons, and the safety and security of nuclear facilities, materials and personnel, are global, they typically hit the rubber in regional contexts and in turn regional implementation failures and gaps feed back to dent the credibility of the global orders.

This paper maps the nuclear landscape across Asia and the Pacific on the three NPT legs of nuclear disarmament, non-proliferation, and safety and security. In summary, Asia is the principal site of strategic rivalry in the second nuclear age and the theatre of the least unlikely nuclear war; the nuclear disarmament norm continues to be breached most egregiously in Asia as the only continent where warhead numbers are still growing; the most serious violations of the non-proliferation norm have occurred here in the last two decades and it is the sole site of nuclear testing today; there is no architecture in place to promulgate and police regional regulatory norms and standards for the safe operation of nuclear reactors; and Asia also has some of the most acute nuclear security vulnerabilities.

The Asia-Centric Second Nuclear Age

Analysts distinguish between the first and second nuclear age with significant structural differences between them.[4] The first was shaped by the overarching ideological rivalry of the bipolar Cold War protagonists, the competitive nuclear arms build-up and doctrines of the two superpowers and the development of robust mechanisms for maintaining strategic stability. The site of great power rivalry has shifted from Europe to Asia in the second nuclear age characterized by a multiplicity of nuclear powers with criss-crossing ties of cooperation and conflict, the fragility of command and control systems, threat perceptions between three or more nuclear-armed states simultaneously and the resulting greater complexity of deterrence relations between the nine nuclear-armed states. The nuclear relationship between India and Pakistan, for example, is conceptually, politically and strategically deeply intertwined with China as a NWS. Changes in the nuclear posture of one can generate a cascading effect on several others. The strategic boundary between nuclear warheads and conventional precision munitions is also being steadily eroded. And three US allies depend for their national security on the extended (nuclear) deterrence provided by US nuclear weapons. Moreover, there is no overarching security framework or political organization, comparable to the Organisation for Security Cooperation in Europe (OSCE) or Council of Europe,

[4] Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012); Toshi Yoshihara and James R. Holmes, eds., *Strategy in the Second Nuclear Age: Power, Ambition, and the Ultimate Weapon* (Washington DC: Georgetown University Press, 2012); Gregory D. Koblentz, *Strategic Stability in the Second Nuclear Age* (New York: Council on Foreign Relations, Special Report No. 71, November 2014).

the Organization of American States, or the African Union, in which a pan-continental security dialogue can be nested. The closest, if a poor, approximation is the informal Asia–Pacific Leadership Network for Nuclear Non-Proliferation and Disarmament (APLN) comprising around seventy former senior leaders.[5]

China is the only nuclear-armed state alleged to have acted as the enabler for the emergence of another nuclear-armed state (Pakistan), although others also have provided partial assistance (as with France and Israel). Pakistan's nuclear weapons capability is essentially China's. In 1983 a US State Department report concluded that there was "unambiguous evidence" that Pakistan was actively pursuing a nuclear weapons program. Moreover, "China has provided assistance to Pakistan's program to develop a nuclear weapons capability"; Pakistan's nuclear blueprint was in fact made in China. Thomas Reed, a former nuclear weapons designer at Lawrence Livermore National Laboratory, Secretary of the Air Force under presidents Gerald Ford and Jimmy Carter, and Special Assistant to President Ronal Reagan for National Security Policy, has claimed that Pakistan's first nuclear weapon test was carried out for it by China on 26 May 1990.[6] The "deliberate act of proliferation" by China began in earnest in 1982 with the transfer of weapons-grade uranium and a blueprint for making a bomb that China had already tested.[7] After the suspension of US aid in 1989, Pakistan built 7-12 nuclear warheads "based on the Chinese design, assisted by Chinese scientists and Chinese technology."[8] According to the US Senate Governmental Affairs subcommittee on international security and proliferation, China sold proliferation-sensitive weapons technology to Iran and Pakistan at least nine times between 1995–97.[9]

Pakistan is the only one of the nine nuclear-armed states where nuclear weapons were developed by the military, are essentially under military control and the decision to use them will be made by the military rather than civilian leadership. Also uniquely among all nuclear-armed states, Pakistan hosts and

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5 www.a-pln.org.

6 Interview with Thomas C. Reed in Alex Kingsbury, "Why China helped countries like Pakistan, North Korea build nuclear bombs," *U.S. News & World Report*, 2 January 2009, http://www.usnews.com/articles/news/world/2009/01/02/why-china-helped-countries-like-pakistan-north-korea-build-nuclear-bombs.html. Accessed on 18 January 2009. Reed also claims that China intentionally proliferated to North Korea too. See also William J. Broad, "Hidden travels of the atomic bomb," *New York Times*, 8 December 2008; Dan Vergano, "Scientists ponder how to get nuclear genie back in the bottle," *USA Today*, 14 December 2008, http://www.usatoday.com/tech/science/2008-12-14-nuclear-weapons_N.htm, accessed on 18 January 2009; and, Thomas C. Reed and Danny B. Stillman (former director of the technical intelligence division at Los Alamos National Laboratory), *The Nuclear Express: A Political History of the Bomb and Its Proliferation* (Zenith Press, 2009).

7 R. Jeffrey Smith and Joby Warrick "A nuclear power's act of proliferation," *Washington Post*, 13 November 2009.

8 Tim Weiner, "U.S. and Chinese aid was essential as Pakistan built bomb," *International Herald Tribune*, 2 June 1998.

9 *Defense News*, 14–20 April 1997, pp. 3, 26.

supports terrorist and insurgent groups as instruments of security policy and is a revisionist state with a major irredentist claim on its neighbour. As a result, unlike other dyadic nuclear rivalries that focus on managing stability, Pakistan seeks "managed instability" which is poorly understood, analyzed and theorized.[10]

North Korea is the world's only NPT defector state, having pulled out of the NPT in 2003. It is unique in the family of nations: a communist dynastic dictatorship (the third generation is currently in control) that has been a basket case for virtually its entire existence, guilty of acts of aggression and serial provocations against its more populous, prosperous and democratic southern kin state, of acts of state criminality in kidnapping Japanese citizens in Japan and smuggling them into North Korea, as well as acts of terrorism. It is hardly surprising then that the prospect of useable and deliverable nuclear weapons in North Korean hands sends shivers down many spines.

India is the only one of the nine nuclear-armed states to have territorial conflicts with two nuclear-armed states, China and Pakistan, over long and contested borders. India had the longest time lag of the nine between acquiring the capability and the bomb and is the only one of the nine committed to nuclear abolition in its official doctrine. It is the only democracy among Asia's four nuclear-armed states. On the other hand it is also the only country to have invented the legal fiction of a 'peaceful nuclear explosion' that earned it international opprobrium, with no compensating national security benefit, for violating the terms of bilateral civilian nuclear assistance, introducing nuclear capabilities and triggering a nuclear arms race in the region by accentuating Pakistan's anxieties and insecurities.

There are far fewer nuclear weapons today than during the Cold War, they play a lesser role in shaping relations between Moscow and Washington and the risk of a deliberate nuclear war between them is very low.[11] Yet the overall risks of nuclear war have grown – as more countries in more unstable regions have acquired these deadly weapons, terrorists continue to seek them and command and control systems in even the most sophisticated nuclear-armed states remain vulnerable to human error, system malfunction and cyber-attack. Northeast Asia is the world's most dangerous cockpit for a possible nuclear war that could directly involve three NWS (China, Russia, and the US) plus North Korea as a non-NPT nuclear-armed state and South Korea, Japan and Taiwan as major US allies. North

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10 Shaun Gregory, "Pak toxic chaos plan changes nuke debate," *Times of India*, 6 March 2011, http://timesofindia.indiatimes.com/home/sunday-times/all-that-matters/Pak-toxic-chaos-plan-changes-nuke-debate/articleshow/7637964.cms. Accessed 12 May 2016.

11 However, the flare-up of geopolitical tensions over Ukraine in 2014 heightened the danger of an unintended nuclear war: Robert E. Berls and Leon Ratz, "Rising Nuclear Dangers: Assessing the Risk of Nuclear Use in the Euro–Atlantic Region," *NTI Paper* (Washington: Nuclear Threat Initiative, October 2015), http://www.nti.org/media/pdfs/NTI_Rising_Nuclear_Dangers_Paper_FINAL.pdf?_=1443443566. Accessed 12 May 2016.

Korea's nuclear threat and the risk of war in Korea involving US troops, potential direct conflict with China, risk to the Taiwan Straits, risks to South Korea and Japan, and the risk of DPRK direct use against US territories are critical and demand immediate, urgent attention.

The toxic cocktail of growing nuclear stockpiles, expanding nuclear platforms, irredentist territorial claims and out of control jihadist groups makes the Indian subcontinent a high risk region of concern.[12] Even a limited regional nuclear war, in which India and Pakistan used 50 Hiroshima-size (15kt) bombs each, could lead to a famine that kills up to two billion people.[13] The geostrategic environment of the subcontinent had no parallel in the Cold War.[14] Propinquity and the pattern of population distribution would leave both India and Pakistan vulnerable to fallout from their own weapons used against the other, producing a measure of self-deterrence. India and Pakistan share a long border; the US–USSR did not. Contiguity permits India and Pakistan to meddle inside each other's territory in numbers and on a scale that was not an option during the Cold War. It also dramatically shortens the timeframe within which either country would have to decide, in the midst of a tense crisis or war, whether or not to use nuclear weapons. The entire province of Kashmir is in dispute; the US–USSR had no direct territorial dispute. India and Pakistan have fought three and a half wars (1947, 1965, 1971 and 1999 [Kargil as the half-war]); Moscow and Washington fought none. India shares a long border with nuclear-armed China which too is disputed. This introduces a three-way territorial conflict into the strategic equation which was never the case during the Cold War. All these worries are exacerbated by political volatility and instability in both countries, even though there is no equivalence between the two. Pakistan's government faces economic meltdown and political challenges from Islamist groups and the military.

India–Pakistan confidence-building measures include agreements not to attack each other's nuclear facilities, an annual exchange of lists of such facilities and advance notification of missile launches within a specified range of each other's territories. Nevertheless, risks abound of escalation pressures in nuclear-armed neighbours lacking normal relations and subject to a surfeit of spoilers. Premeditated large-scale conventional attacks and pre-emptive nuclear strikes seem unlikely pathways to a nuclear exchange between India and Pakistan or

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12 See Pervez Hoodbhoy and Zia Mian, "Nuclear battles in South Asia," *Bulletin of the Atomic Scientists*, 4 May 2016, http://thebulletin.org/nuclear-battles-south-asia9415. Accessed 5 May 2016.

13 Ira Helfand, *Nuclear Famine: Two Billion People at Risk? Global Impacts of Limited Nuclear War on Agriculture, Food Supplies, and Human Nutrition* (Somerville, MA: International Physicians for the Prevention of Nuclear War, 2013). http://www.ippnw.org/pdf/nuclear-famine-two-billion-at-risk-2013.pdf. Accessed 15 May 2016.

14 Ramesh Thakur, "The Inconsequential Gains and Lasting Insecurities of India's Nuclear Weaponization," *International Affairs* 90:5 (2014), pp. 1101–24.

between China and India. But the subcontinental rivalry is not free of the risk of a nuclear exchange triggered by acts of terror committed on Indian territory by individuals and groups linked to networks across the border in Pakistan. A deliberate, calculated use of nuclear weapons by either government is not likely. But no one can be confident that another Mumbai style terrorist attack (November 2008) on a major Indian city will not take place, with links back to jihadists based in Pakistan;[15] that India will not retaliate militarily; and that this will not escalate to another war which then crosses the nuclear threshold. That is, the brittleness of deterrence stability is a function of fragile crisis stability mechanisms. Moreover, each party will feel more insecure with every increase in the other's nuclear weapons stockpiles and capabilities.

Evading the Duty to Disarm

Article 6 of the NPT obligates the five NWS to negotiate in good faith towards nuclear disarmament. The legal norm was strengthened by the World Court's Advisory Opinion in 1996 requiring the NWS to bring the negotiations to a close. But the nine nuclear-armed states pay at best lip-service to the ultimate elimination of nuclear weapons. On the evidence of the size of their weapons arsenals, fissile material stocks, force modernization plans, stated doctrine and known deployment practices, all nine foresee indefinite retention of nuclear weapons and a continuing role for them in their security policies.[16] Even though their combined stockpiles total only three percent of global nuclear arsenals, warhead numbers are growing in all four Asian nuclear-armed states, making Asia the only continent where nuclear stockpiles are still increasing.

China

China, the only Asian member of the NPT-licit club of NWS, is also the only NWS whose nuclear arsenal is presently growing. Heavily dependent on land-based missiles, China is actively modernizing them to increase the survivability and strengthen the retaliatory capabilities of its nuclear forces.[17] A credible, near-continuous sea-based deterrent capability would significantly increase the survivability of its nuclear forces. There is no evidence to suggest China is engaged in a "sprint to parity" with Russia or the US. Its nuclear arsenal has

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15 Ramesh Thakur, "Delinking Destiny from Geography: The Changing Balance of India–Pakistan Relations," *India Quarterly* 67:3 (2011), pp. 197–212.

16 Gareth Evans, Tanya Ogilvie-White and Ramesh Thakur, *Nuclear Weapons: The State of Play 2015* (Canberra: Centre for Nuclear Non-Proliferation and Disarmament, 2015), https://cnnd.crawford.anu.edu.au/publication/cnnd/5328/nuclear-weapons-state-play-2015.

17 Li Bin, "Tracking Chinese Strategic Mobile Missiles," *Science & Global Security* 15:1 (2007), pp. 4–5.

evolved and grown rather more slowly than was the case historically with the United States and the former Soviet Union. China's nuclear weapons, stated doctrine, force posture and deployment patterns are designed neither to coerce others nor to fight a nuclear war with the expectation of winning, but to counter any attempt at nuclear blackmail. Consistent with this, China maintains a no-first-use policy and holds that the NWS should abandon nuclear deterrence policy based on first use of nuclear weapons and instead conclude a treaty on no first use of nuclear weapons against one another.

The failure of the US to reduce the role of nuclear weapons in its national security strategy has spillover effects on the nuclear posture of other nuclear-armed states. The growing accuracy and lethality of US conventional precision munitions, the continuing interest in ballistic missile defence (BMD) systems and the refusal of the US to adopt a no-first-use policy makes many Chinese nervous over possible US doubts about China having a robust enough survivable second-strike retaliatory capability. In September 2014, the Shanghai Cooperation Organization (which includes China, Russia and four Central Asian states) declared that "The unilateral and unlimited capacity of individual states' or groups of states' missile defense systems will be detrimental to international security and strategic stability."[18] Chinese anxieties are strengthened by the US refusal to acknowledge mutual vulnerability vis-à-vis China. According to Gregory Kulacki, in "a significant – and dangerous – change in Chinese policy," China's military planners have for the first time begun to discuss putting the country's nuclear missiles on high alert, believing that this "would be a step toward assured retaliation."[19]

Russia and the US maintain approximately 1,800 nuclear warheads in a state of high operational readiness to be launched en masse before the apprehended arrival of incoming enemy missiles. With relatively small nuclear forces, China is concerned that its nuclear deterrent is vulnerable to planned US conventional precision munitions that pose a potential a threat to Beijing's conventional and nuclear weapons systems, as well as its command-and-control centres.[20] If China follows the Russian and US lead, how long before the posture proliferates to India and Pakistan? Like nuclear terrorism, the launch of nuclear weapons on high alert by mistake, rogue launch, miscalculation of incoming information, or through system malfunction is low probability but high impact. Taking nuclear warheads

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18 "Bloc led by Russia and China criticizes U.S. over missile defense," *Reuters*, 12 September 2014.

19 Gregory Kulacki, *China's Military Calls for Putting Its Nuclear Forces on Alert* (Cambridge MA: Union of Concerned Scientists, January 2016), p. 1. http://www.ucsusa.org/sites/default/files/attach/2016/02/China-Hair-Trigger-full-report.pdf. Accessed 9 May 2016.

20 Douglas Barrie, "China's Hypersonic Test – Behind the Headlines," *Military Balance Blog* (IISS), 30 January 2014, http://www.iiss.org/en/militarybalanceblog/blogsections/2014-3bea/january-1138/barrie-china-d0a8. Accessed 16 May 2016.

and systems off high alert can deepen the stability of nuclear deterrence by lengthening the decision-making fuse.

India

Neither India nor Pakistan has signed the NPT and therefore neither is bound by the Article 6 obligation to disarm. That said, it is difficult to challenge the claim – based on the NPT, the repeated demands from successive NPT Review Conferences, a multitude of UN General Assembly resolutions over the decades, and the humanitarian impacts initiative that has attracted over 150 states and a broad cross-section of civil society actors in the global arms control community – that there is a global norm to eliminate nuclear weapons.

India is estimated to possess around 110 warheads, is producing more bombs annually, and is working to create survivable nuclear forces based on a mix of different land, sea and air-based launch platforms. It is also developing and testing a mix of short, medium and long range missiles, plus nuclear-powered ballistic missile submarines. It has ambitions to design and build multistage ballistic rockets, remote sensing and communications satellites, and monitoring and guidance systems for putting different types of vehicles into space orbit. India's declared nuclear doctrine is "credible minimum nuclear deterrence." India will not be the first to use nuclear weapons but would "respond with punitive retaliation should deterrence fail"[21] and India or its armed forces are attacked by a weapon of mass destruction (WMD).

Pakistan

Pakistan has had a nuclear weapons program since the early 1970s and is currently estimated to have about 120 warheads for delivery by missiles and aircraft. Its nuclear arsenal is growing the fastest of any country in the world.[22] Like India, its nuclear doctrine is based on the principle of "credible minimum deterrence," with resort to nuclear weapons envisaged only in response to an existential conventional or WMD threat.[23] Pakistan's nuclear doctrine is India-specific, although, particularly after the US raid on Abbotabad in May 2011 that killed Osama bin Laden and in light of continuing strong differences of opinion on regional security issues, the expansion and modernization of Pakistan's nuclear

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21 Draft *Report of the National Security Advisory Board on Indian Nuclear Doctrine*, 17 August 1999; http://www.fas.org/nuke/guide/india/doctrine/990817-indnucld.htm. Accessed 16 May 2016.

22 Andrew Bast, "Pakistan's Nuclear Calculus," *Washington Quarterly* 34:4 (2011), 75–77.

23 Ayaz Gul, "Pakistan rejects US call for curbing tactical nuke weapons," *Global Security Newswire*, 26 March 2016, http://www.globalsecurity.org/wmd/library/news/pakistan/2016/pakistan-160326-voa01.htm. Accessed 16 May 2016..

arsenal may also be driven partly by fears of a US raid to capture or secure its nuclear forces.[24] The development of tactical nuclear weapons as a counter to India's superiority in conventional arms, and to compensate for its lack of strategic depth, would seem to leave open the possibility of first use of nuclear weapons against India, particularly in the case of invasion. Deployment of battlefield nuclear weapons requires the delegation of command and control to military units in the field. This increases the risks of miscalculation, accident, theft, and infiltration by militant groups.

North Korea

North Korea is the most recent member of the nuclear-armed club, possesses a much smaller nuclear arsenal than the other eight, and remains the subject of intense diplomatic efforts aimed at dismantling its nuclear weapons program. It withdrew from the NPT in January 2003,[25] has conducted four nuclear weapon tests (2006, 2009, 2013, 2016) and several rocket and missile launches, but its capacity to target and hit other countries is still very limited. In May 2015 Pyongyang boasted it had successfully tested a submarine launched ballistic missile (SLBM). On 6 January 2016 it claimed to have successfully tested a hydrogen bomb followed by a rocket launch. As its restarted plutonium separation and uranium enrichment programs ramp up to full production, it will soon have the capability to produce several nuclear bombs every year. I will return to Korea in the next section on non-proliferation.

Extended Nuclear Deterrence as an Obstacle to Nuclear Disarmament

In addition to four of the world's nine nuclear-armed states, Asia also accounts for several states that rely on the US for their security, including some who are explicitly umbrella states: that is, countries that rely on the US extended nuclear deterrence. The argument has been expressed very sharply in the recent Australian Defence White Paper: "Only the nuclear and conventional military capabilities of the United States can offer effective deterrence against the possibility of nuclear threats against Australia."[26] The reliance of Japan and South Korea on the US

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24 Shyam Saran, "Dealing with Pakistan's brinkmanship," *Hindu*, 7 December 2012.

25 A State Party has the right to withdraw from the NPT if it decides that "extraordinary events, related to the subject matter of [the] Treaty, have jeopardized the supreme interests of its country" (Article 10). North Korea announced its withdrawal from the NPT on 12 March 1993 but then suspended it on 11 June 1993, the day before the decision would have taken effect. In January 2003, North Korea ended the suspension, which for all practical purposes meant withdrawal with immediate effect. Christer Ahlstrom, "Withdrawal from arms control treaties," *SIPRI Yearbook 2004: Armaments, Disarmament and International Security* (Oxford: Oxford University Press, 2004), pp. 763–77.

26 Department of Defence, *2016 Defence White Paper* (Canberra: Government of Australia, 2016), paragraph 5.20.

nuclear umbrella is, if anything, even greater, given their propinquity to North Korea and China (as well as Russia as the third Northeast Asian nuclear-armed state). The particular significance of the US commitment here is seen as lying in its very strong incentive for Japan and South Korea not to acquire a deterrent nuclear capability of their own. But this severely limited (in numbers) non-proliferation benefit comes at the cost of undermining their nuclear disarmament and broader non-proliferation credentials, since their umbrella status leaves them exposed to the charges of hypocrisy in advocating nuclear abstinence by others when they are consenting participants in nuclear deterrence themselves.

Japan has invested heavily in the development of a layered BMD system. South Korea also has a national program, which would be closely coordinated with US forces in a conflict, and the three countries discuss missile defence in their trilateral dialogue. Australia too has been cooperating with the US on BMD. If these various efforts at bilateral BMD cooperation develop into a US-led Asia–Pacific missile defence shield, China is likely to accelerate the expansion of its own nuclear and ballistic missile programs and possibly adopt a somewhat more robust nuclear deterrence doctrine.

Based on this brief overview of the nuclear state of play in Asia against the global strategic backdrop, the overall objectives and strategy that the international community should be pursuing in relation to nuclear disarmament might realistically be described as a rapid movement towards a major overall reduction in the nuclear warhead numbers of Russia and the US which hold 93 percent of global stockpiles. This should be accompanied by an immediate freeze in the stockpiles of the Asian nuclear-armed states. The Cartwright study argued that once the two major nuclear powers had reduced their arsenals to the hundreds, China could be drawn into the negotiations followed by the other nuclear-armed states.[27] With each new entrant into the multilateral arms control negotiations, it would become progressively more difficult for the remainder to stay outside the process.

Breaching the Non-Proliferation Norm

The first substantial breach of the NPT-centred non-proliferation norm occurred by Israel in the 1970s. On 18 May 1974, India conducted its first test, describing it disingenuously as a “peaceful nuclear explosion.” On 11 and 13 May 1998, India conducted another five nuclear tests and this time proclaimed itself to be a nuclear

[27] James Cartwright, et al., *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*. Global Zero U.S. Nuclear Policy Commission Report (Washington DC: Global Zero, May 2012), p. 4, http://www.globalzero.org/files/gz_us_nuclear_policy_commission_report.pdf. Accessed 16 May 2016.

weapons possessor state.[28] Pakistan followed with six tests of its own (to match India's six in 1974 and 1998 combined) on 28 and 30 May 1998. Since then both countries have been more or less accepted as de facto nuclear-armed states. In addition, India has also been granted a country-specific waiver by the Nuclear Suppliers Group for international trade in sensitive nuclear materials and signed bilateral civil nuclear supply agreements with several countries, despite its status as an NPT non-signatory. However justified these might be on grounds of India's impeccable record of non-proliferation to third countries and as a means of drawing the country with rising economic profile, geopolitical heft and diplomatic weight into global coalitions, they have caused undoubted damage to the existing non-proliferation normative regime.[29]

The global ban on nuclear testing by the Comprehensive Test Ban Treaty (CTBT) is a key barrier both to vertical proliferation by the nuclear-armed states and to horizontal proliferation by non-NWS. By 2016, 183 countries had signed and 164 had ratified the CTBT. This still left eight countries, out of the 44 with nuclear reactors listed in Annex 2 of the treaty, whose ratifications are needed to bring it into force: China, Egypt, India, Iran, Israel, North Korea, Pakistan, and the US.[30] The other Asia–Pacific non-signatories are Bhutan, Mauritius, Tonga and Tuvalu. Myanmar, Nepal, Papua New Guinea, Solomon Islands, Sri Lanka, Thailand and Timor-Leste have signed but not yet ratified. Since the treaty's adoption in 1996, just a handful of nuclear-weapon test explosions have been conducted. Unfortunately, all of these were in Asia in India, Pakistan and North Korea.

Like the US, China, India and Pakistan too maintain voluntary moratoria on testing. China also supports the treaty's early entry into force in principle, participates in the work of the Preparatory Commission for the CTBT Organization (CTBTO) and is preparing for national implementation of the treaty.[31] China's formal ratification would likely quickly follow US ratification, although Beijing neither acknowledges nor implies any link to ratification by another state. Similarly, it is not clear why India has not yet ratified the CTBT other than a difficult domestic political environment. There are no technical requirements for more tests within its professed doctrine of credible nuclear

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28 See Sumit Ganguly, "India's Pathway to Pokhran II: The Prospects and Sources of New Delhi's Nuclear Weapons Program," *International Security* 23:4 (1999), pp. 148–77; and George Perkovich, *India's Nuclear Bomb: The Impact on Global Proliferation* (Berkeley CA: University of California Press, 1999).

29 See Ramesh Thakur, "Follow the Yellowcake Road: Balancing Australia's Security, Commercial and Bilateral National Interests against International Anti-Nuclear Interests," *International Affairs* 89:4 (2013), pp. 943–61.

30 http://www.ctbto.org/the-treaty/.

31 Viyyanna Sastry, "The Poor Prospects of the CTBT Entering Into Force," 9 January 2012, Institute for Defence Studies and Analyses, http://www.idsa.in/idsacomments/ThePoorProspectsoftheCTBTEnteringIntoForce_cvsastry_090112. Accessed 16 May 2016.

deterrence. Nor is there any reason why, as an earnest of its good faith in engaging with the global physical infrastructure, India could not actively participate in the CTBTO global system even without signing or ratifying the CTBT.[32]

A related treaty-based regime that does not yet exist but many deeply desire would prohibit additional production of fissile material for nuclear weapons use. Pakistan has consistently blocked the adoption of any program of work in the CD in Geneva because it will not agree to FMCT negotiations in the absence of prior agreement to include existing stocks of weapons-grade fissile material, where it believes itself to be at a disadvantage vis-à-vis India.

The Additional Protocol (AP) is a formal document that grants the International Atomic Energy Agency (IAEA) complementary legal authority to verify a state's comprehensive, item-specific or voluntary offer safeguards obligations. Although voluntary, once an AP enters into force it becomes legally binding for the state. In March 2016, 127 states had an AP in force; another 19 had signed but were yet to bring it into force.[33] Countries of the Asia–Pacific that signed or approved the AP but for whom it is not yet in force are Kiribati, Laos, Malaysia, Myanmar, Thailand and Timor Leste, of whom Malaysia and Thailand have significant nuclear activities.

The final plank of the non-proliferation structure relevant to Asia–Pacific is nuclear-weapon-free zones (NWFZ) that deepen and extend the scope of the NPT and embed the non-nuclear weapon status of NPT States Parties in additional treaty-based arrangements.[34] Asia–Pacific has two NWFZ covering the South Pacific and Southeast Asia. Mongolia and New Zealand have also declared themselves national NWFZ in law.

How to Solve a Problem Like North Korea

North Korea's pursuit of nuclear weapons began in the 1960s, accelerated in the 1980s and led to the collapse of the 1994 Agreed Framework that had frozen Pyongyang's nuclear program. It has made repeated commitments to abandon the weapons path in return for security assurances and economic assistance, shelved its nuclear ambitions temporarily and then broken its promises serially. Its nuclear program has been enshrined in the constitution and embedded in party ideology, making reversal procedurally more challenging and politically more costly. To keep the scale and gravity of the North Korean threat in perspective, nevertheless, let us note that its nuclear tests have been on the small side, some of its claims are

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32 See Ramesh Thakur and John Carlson, "How India can support the CTBT before signing," *Japan Times*, 9 April 2015.

33 https://www.iaea.org/safeguards/safeguards-legal-framework/additional-protocol. Accessed 15 May 2016.

34 Ramesh Thakur, *Nuclear Weapons and International Security: Collected Essays* (London: Routledge, 2015), pp. 163–81.

bombastic and exaggerated, and several of its attempted missile tests are known to have been flops. In other words Pyongyang is still some distance from acquiring a reliable deliverable nuclear weapon capability. But it does have a rudimentary capability and a few small bombs, and both are set to expand. Thus empirically North Korea now belongs in the disarmament basket. But its defector status imposes the straitjacket of having to deal with it still through the non-proliferation lens. This is especially the case because of fears of a cascade of proliferation in the region if North Korea were to be accorded a de facto nuclear-armed state status.

Can the Iranian model for getting to a denuclearization agreement be applied to the Northeast Asian pariah regime? Some key differences between the two situations are worth noting. Iran did not possess a single nuclear weapon. The challenge was to cap its capability in order to prevent a potential breakout.[35] By contrast, North Korea already has several, has conducted four nuclear tests, is believed to have restarted and ramped up its fissile materials production and as the additional materials come downstream, it will have the capacity to start making several new bombs every year. In addition its delivery capability is also growing. In other words the train of non-proliferation left the Pyongyang station a decade ago and is now out of sight; it was stopped from ever arriving at a platform at Tehran station.

Second, the hermit kingdom is so deeply isolated already that it is hard to see the incremental pain of still more sanctions tipping it into a search for compliance. Clearly the pain of sanctions is within the tolerance threshold for the regime. In Iran the middle class and the youth were decidedly keen to secure an end to the sanctions regime and re-join the region and the world. There is no evidence to suggest that the North Korean people have any such desire that acts as a domestic source of pressure on the regime. Similarly in Iran there is genuine domestic political contestation and, no matter in how limited a form, genuine competitive elections between candidates offering alternative visions on the spectrum of hardline opposition to accommodation vis-à-vis the international community. This consideration is entirely irrelevant in the North Korean case.

Third, the West has very limited leverage with respect to North Korea. The only external actor with any meaningful – but not necessarily decisive – leverage is China. Instead of a P5 (China, France, Russia, UK, USA) +1 (Germany) formula, therefore, it might have to be a case of 1 (China) + P4 (France, Russia, UK, USA) + E2 (Japan, South Korea).[36] The key to any progress on the agenda

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35 Ramesh Thakur, "To Stop Iran Getting the Bomb, Must We Learn to Live with Its Nuclear Capability?" *Strategic Analysis* 36:2 (2012), pp. 328–34.

36 Bringing the two cases together like this in one sentence highlights another striking difference. The P5+1 Iran negotiations framework did not include a single regional actor beyond the country of concern. In Northeast Asia, any negotiating framework that excluded South Korea and Japan would be such a non-starter that it is hard to see it being seriously proposed.

lies in Beijing and China's ability and willingness to ratchet up the pressure on the North Korean regime. With over 200,000 Chinese soldiers having been killed during the 1950s Korean War to this end and their ultimate sacrifice not forgotten, preserving North Korea as a territorial buffer remains a critical Chinese security goal and indeed has increased in importance with the resurgence of geopolitical tensions in the region. On the other hand, Pyongyang's unpredictable, erratic and provocative behaviour heightens regional instability, strengthens US alliances with Japan and South Korea, builds sentiment in the latter two countries for nuclear weaponization, and increases the risk of an unwanted conflict that would undermine China's own development goals.

That said, the lessons that are relevant from the Iran example are (1) the importance of an international coalition that brings together mutually reinforcing UN, US, EU and East Asian sanctions regimes; (2) a new diplomatic framework that supersedes the dated Six Party Talks that have long since passed their use-by date; (3) an abandonment of complete denuclearization as a precondition for talks with Pyongyang; (4) a credible prospect of a lifting of sanctions as an inducement to Pyongyang to engage with external interlocutors; and (5) an agreed goal among East Asian and international partners on the final product. Like the Iran case, if they aim for the maximum objective of complete rollback and denuclearization of North Korea, they will have to learn the Asian virtue of inter-generational patience. If they pursue a freeze on present numbers, fissile stocks, delivery vehicles and modernization, and cessation of provocations and export of nuclear/missile material, components and technology, they will need to buttress this with a mix of rewards and penalties that are clear and will come with sufficient predictability to work as behaviour modification stimuli.

For the strategy to have any success, Pyongyang's insecurity complex will have to be addressed, including fears of vulnerability to forcible regime change by Washington. Senior North Korean officials have said to a former (1986–97) director of the Los Alamos National Laboratory that "if Slobodan Milosevic in Serbia, Saddam Hussein in Iraq and Muammar Gaddafi in Libya had had nuclear weapons, their countries would not have been at the mercy of the Americans and their regime-change tactics."[37] To this list we might now well add the Russian intervention in Ukraine and the annexation of Crimea in 2014 in clear violation of the 1994 Budapest Memorandum wherein Russia, the UK and the US had guaranteed Ukraine's territorial integrity in return for Kiev's agreement to remove 1,900 strategic and 2,500 tactical Russian nuclear weapons stationed in Ukraine. The currency of international great power security guarantees in return for renouncing nuclear weapons has been much debased.

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[37] Siegfried S. Hecker, "For Iran, a nuclear option more trouble than it was worth," *Bulletin of the Atomic Scientists*, 18 January 2016, http://thebulletin.org/iran-nuclear-option-more-trouble-it-was-worth9064. Accessed 16 May 2016.

John Carlson suggests it may be worth testing Pyongyang on a freeze[38] in return for converting the 1953 armistice into a peace treaty, as the prelude to a difficult and protracted negotiation that culminates in a comprehensive peace settlement for the peninsula.[39] Part of the challenge in the latter goal would be to reconcile the West's call for denuclearization of the Korean Peninsula aimed at terminating the North's nuclear weapon program, with Pyongyang's insistence that denuclearization must include removal of the US nuclear umbrella. Moreover, because of the deep trust deficit in the region, any agreement will have to be underpinned by a robust and credible verification and monitoring system.

Amid rising nationalism in the region, territorial disputes in the East and South China Seas, continued North Korean nuclear defiance, and concerns about the Obama administration's disarmament agenda, doubts about the reliability of US deterrence have been catalysts for pro-nuclear arguments in Japan and South Korea.[40] Influential voices, including lawmakers, have been raised in Seoul urging a return of US nuclear warheads stationed on South Korean territory and/or the acquisition of an independent nuclear deterrent by the South. A leading conservative daily published an article pointing to how Seoul could get the bomb in 18 months.[41] In 2006, the Japanese government commissioned an internal confidential report on the possibility of producing its own nuclear weapons.[42] In a written answer in parliament on 1 April (sic), the Abe government announced that while it remains firmly committed to Japan's three non-nuclear principles (no manufacture, possession or basing of nuclear weapons) as a matter of policy, in its view the war-renouncing Article 9 of the Constitution does not, in fact, prohibit Japan from possessing and using nuclear weapons.[43] The limitations of reactor-

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38 Interestingly, in a recent set of articles on North Korea, the three Chinese, South Korean and Russian analysts agreed that the goal of "complete, verifiable and irreversible denuclearization" is fanciful and a freeze is the more realistic objective worth pursuing. Shen Dingli, "Acknowledging reality: A pragmatic approach to Pyongyang"; Chung-in Moon, "North Korea: A negotiated settlement remains the best hope"; and Andrei Lankov, "North Korea: Don't dream the impossible," *Bulletin of the Atomic Scientists*, 1 and 2 June 2016; http://thebulletin.org/north-koreas-nuclear-weapons-what-now. Accessed 9 June 2016.

39 John Carlson, "Dealing with the North Korean Nuclear Threat," *The Interpreter*, 9 May 2016; http://www.lowyinterpreter.org/post/2016/05/09/Dealing-with-the-North-Korean-nuclear-threat.aspx?p=true. Accessed 9 May 2016.

40 Peter Hayes and Chung-in Moon, "Should South Korea Go Nuclear?" EAF Policy Debates No. 7, 28 July 2014; Henry Sokolski, "Japan and South Korea may soon go nuclear," *Wall Street Journal*, 8 May 2016; http://www.wsj.com/articles/japan-and-south-korea-may-soon-go-nuclear-1462738914. Accessed 9 May 2016.

41 Lee Young-Wan, "6 Months to Produce Fissile Materials, 6-9 Months to Develop a Detonation Device...South Korea Could Arm Itself With a Nuclear Weapon in 1.5 Years," *Chosun Ilbo*, 19 February 2016, trans. Raymond Ha; http://npolicy.org/article.php?aid=1313&rid=2. Accessed 10 May 2016.

42 "Nuclear arms card for Japan," *Japan Times*, 29 April 2013; an abridged translation of an article from the April issue of *Sentaku*.

43 "Abe Cabinet says Article 9 does not ban possessing, using N-weapons," *Asahi Shimbun*, 2 April 2016; http://www.asahi.com/ajw/articles/AJ201604020026.html. Accessed 10 May 2016.

grade plutonium for weaponization are less relevant for technologically advanced countries. Japan has stockpiled about 11 tonnes of plutonium, purportedly to launch a new generation of plutonium-fuelled fast breeder reactors that is of very dubious commercial logic. Because a nuclear warhead requires only between 4-5kg of plutonium, Japan's existing stockpile is enough to make well over 2,000 nuclear bombs.[44]

Thus far at least these represent minority views. Internationally, the NPT constrains the weapon option, the US nuclear extended deterrence bolsters Japan's security confidence and weaponization could rupture relations with Washington. Similar comments apply to South Korea. Tokyo is also acutely conscious of the extreme regional sensitivities to any nuclearization. Domestically, the three non-nuclear principles, the very strong nuclear allergy in public opinion, and the atomic energy basic law that limits nuclear activity to peaceful purposes are additional powerful constraints on the weapons option. Even so, while Japan's and South Korea's nuclear weaponization taboo may survive intact for now, the threshold for debate about it has been progressively lowered with serial North Korean provocations and Chinese belligerence.

Safety and Security Architecture Deficits

Safety

Interest in expanding nuclear power remains strong, especially in Asia, despite the 2011 Fukushima nuclear meltdown. The continent accounts for 28 and 25 per cent respectively of the number of reactors in operation and amount of electricity generated by nuclear power in the world at present. When looking at reactors under construction and planned, Asia's global share climbs dramatically to 58 and 51 per cent of reactors, and to 57 and 65 per cent of the share of electricity to be generated by nuclear power (Table 1). The Fukushima accident highlighted the need for stronger international governance and closer international cooperation on nuclear safety and security. There is also a continuing need to avoid proliferation risk from the growth in nuclear energy programs, particularly the spread of proliferation-sensitive technologies. The NPT provides the umbrella under which nuclear expertise, technology, components and materials can be transferred between states with due attention to safety, security and proliferation safeguards concerns. Pending agreement on global solutions, practical steps can be taken meanwhile at a regional level. An intergovernmental Asia–Pacific nuclear energy community could facilitate high-level consultation on nuclear plans and programs; regional cooperation and promotion of best practice in safeguards, security and

[44] This is not counting over 35 tonnes that Japan has in France and the UK.

safety; and collaborative arrangements for energy security and fuel cycle management.[45]

Table 1: World Nuclear Power Reactors

	Operating (Mar 2016)			*Under Construction*		*Planned*	
	No.	MWe (net)	% elec-tricity*	No.	MWe (gross)	No.	MWe (gross)
Bangladesh	0	0	0	0	0	2	2 400
China	30	26 849	2.4	24	26 885	42	48 330
India	21	5 302	3.5	6	4 300	24	41 600
Indonesia	0	0	0	0	0	1	30
Japan	43	40 480	0**	3	3 036	9	12 947
Pakistan	3	725	4.3	2	680	2	2 300
S. Korea	25	23 017	30.4	3	4 200	8	11 600
Total Asia	**122**	**96 373**		**38**	**39 101**	**88**	**119 207**
(% of world)	**28**	**25**		**58**	**57**	**51**	**65**
World	440	384 006	11.5	65	68 935	173	182 424

* December 2014

** For 2010, before the Fukushima reactor meltdown in March 2011, nuclear power comprised 29.2% of Japan's electricity generation.

Source: World Nuclear Association, http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx, accessed 9 May 2016. The Association also lists the number of proposed nuclear reactors for the following Asia–Pacific countries: China (136 to generate another 156,000 MWe gross of power), India (36/41,600), Indonesia (4/4,000), Japan (3/4,145) North Korea (1/950), Malaysia (2/2,000), Thailand (5/5,000), and Vietnam (6/6,700).

The 1994 Convention on Nuclear Safety aims to bind states operating land-based nuclear power plants to a high level of safety to international benchmarks set by the IAEA. The obligations cover siting, design, construction, operation, the availability of adequate financial and human resources, the assessment and verification of safety, quality assurance and emergency preparedness. Not all of the 70 states with significant nuclear activities have joined the Convention.[46] Asia–Pacific non-parties are Malaysia, North Korea, the Philippines (which signed on 14 October 1994 but is yet to ratify) and Thailand. There is also a lack of international standards, transparency and accountability. Many states with power reactors remain outside the liability regimes as well.

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45 John Carlson, "An Asia–Pacific Nuclear Energy Community," APLN/CNND *Policy Brief* No. 4 (June 2013). http://www.a-pln.org/?m=briefings&sm=briefings_view&seq=37. Accessed 9 May 2016.

46 Evans, Ogilive-White and Thakur, *Nuclear Weapons: The State of Play 2015*, pp. 238–39.

Security

Nuclear security refers to measures designed to address the risks associated with theft and trafficking in nuclear and radiological materials, sabotage of nuclear facilities and the danger of terrorists acquiring and using a nuclear or radiological weapon. Because a major nuclear security incident anywhere would have far-reaching consequences, effective nuclear security is a global concern. Several worrying incidents are known to have taken place in recent years,[47] pointing to gaps in the existing national and multilateral machinery: lack of universality, binding standards, transparency and accountability mechanisms, and compulsory IAEA oversight; and insufficient attention to nuclear weapons. The terrorists who struck Brussels in March 2016 were apparently planning to attack a nuclear power plant. The very notion of deterrence is utterly irrelevant to groups that hold no territory or fixed assets that can be attacked in retaliation and whose members court martyrdom by suicide.

Table 2: Status of CPPNM, CPPNM Amendment, and ICSANT (8 May 2016)

	Date adopted	Entry into Force	Parties	Signed but not Parties
CPPNM	3/3/1980	08/02/1987	153	1
CPPNM Amendment	08/07/2005	—	103*	N/A
ICSANT	13/04/2005	07/07/2007	104	11

*103 states parties needed for entry into force of the CPPNM Amendment

Asia-Pacific countries with significant nuclear activities (70 such states around the world) that are not yet States Parties:

CPPNM: DPRK, Malaysia, Thailand

CPPNM Amendment: Bangladesh, Malaysia, Philippines, Thailand
ICSANT: DPRK, Malaysia (signed 16.9.2005), Pakistan, Philippines (signed 15.9.2005), Thailand (signed 14.9.2005), Vietnam

Sources: http://www.iaea.org/Publications/Documents/Conventions/cppnm_status.pdf; http://www.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf; https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XVIII-15&chapter=18&Temp=mtdsg3&lang=en

There are three main global treaty regimes underpinning nuclear security (Table 2). The 1980 Convention on the Physical Protection of Nuclear Materials (CPPNM) establishes measures related to the physical protection of nuclear material during international transport and a general framework for cooperation among states in the protection, recovery and return of stolen nuclear material. A major amendment adopted in 2005 requires states to protect nuclear facilities and material in peaceful domestic use, storage and transport. The International

[47] Ibid., Box 3.1, pp. 163–64.

Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT), adopted unanimously by the United Nations General Assembly in 2005, seeks to protect against attacks on a broad range of nuclear targets, punish the perpetrators through domestic criminalization of acts of nuclear terrorism, and promote international cooperation in the prevention and investigation of acts of nuclear terrorism and the prosecution or extradition of the alleged terrorists.

A nuclear security nightmare is jihadists getting their hands on Pakistan's nuclear weapons. Pakistani terrorist groups have shown a capacity to evolve in their targets and tactics of choice in attacking military bases, missile and weapons storage facilities and bunkers. Some of these incidents indicate a worrying element of insider collusion in a context in which Islamist sympathies are believed to exist within the armed forces. The weapons and weapon-related materials are not quite as secure during transportation as when they are within hardened military facilities.[48] And terrorists could seize weapons during a crisis, when they have been assembled for possible use – in fact terrorists could initiate a crisis with exactly this aim.

Nuclear Security Index

Table 3: Theft ranking and scores for Asia-Pacific countries out of 24 with weapons-useable nuclear materials (R = rank, S = score)

Country	*Overall Rank*	*Overall Score*	*Quantities & Sites*		*Security & Control Measures*		*Global Norms*		*Domestic Commitments, Capacity*		*Risk Environ-ment*	
			R	S	R	S	R	S	R	S	R	S
Australia	1	93	=1	100	6	90	=1	100	=1	100	6	76
China	19	60	18	34	15	62	17	76	20	81	18	40
DPRK	24	24	17	38	22	38	24	0	24	4	19	34
India	21	46	=21	22	21	46	=14	81	22	50	22	29
Japan	=12	78	=21	22	=9	82	=1	100	=7	96	2	83
Pakistan	22	42	=21	22	=23	36	22	51	19	85	23	16

Source: *NTI Nuclear Security Index: Building a Framework for Assurance, Accountability, and Action* (Washington DC: Nuclear Threat Initiative, January 2016)

In the third biennial *Nuclear Security Index*,[49] Australia maintains its overall top ranking among the world's 24 states with weapons-useable nuclear materials while Japan is assessed as the most improved state. Following Australia in the top spot are Japan, China, India, Pakistan and North Korea (Table 3). In the theft rankings,

[48] Shaun Gregory, "The Terrorist Threat to Nuclear Weapons in Pakistan," European Leadership Network, 4 June 2013, http://www.europeanleadershipnetwork.org/the-terrorist-threat-to-nuclear-weapons-in-pakistan_613.html. Accessed 16 May 2016.

[49] *NTI Nuclear Security Index: Building a Framework for Assurance, Accountability, and Action* (Washington DC: Nuclear Threat Initiative, January 2016).

four or five of the six Asia Pacific countries are in the bottom half on all measures. An act of sabotage against a nuclear facility could result in a significant radiological release, similar in scale to the release from the Fukushima nuclear power plant in 2011. The 2016 index for the first time assesses nuclear security conditions related to the protection of nuclear facilities against acts of sabotage for 45 countries with nuclear power plants or research reactors. In the composite sabotage ranking, Australia is followed at number 2 by Japan, South Korea, Indonesia, Taiwan, China, India, Pakistan, Bangladesh, and North Korea (Table 4). On all measures six or seven of the countries plus Taiwan are in the bottom half of the table.

Table 4: Sabotage ranking and scores for Asia-Pacific countries and Taiwan out of 45 with nuclear power plants or research reactors

Country (Entity)	*Overall Rank*	*Overall Score*	*No. of Sites*		*Security & Control Measures*		*Global Norms*		*Domestic Commits, Capacity*		*Risk Environ-ment*	
			R	S	R	S	R	S	R	S	R	S
Australia	2	92	=1	100	9	89	=1	100	=1	100	11	76
Bangladesh	=39	49	=1	100	=42	21	=36	62	=27	84	=39	29
China	34	59	=39	40	28	59	34	71	=35	71	=32	40
DPRK	=44	21	=15	80	=42	21	45	0	44	13	36	34
India	=36	54	=30	60	=26	60	=27	79	=42	47	=39	29
Indonesia	31	63	=15	80	30	54	32	76	=27	84	=32	40
Japan	5	89	=42	20	=10	88	=1	100	=1	100	4	83
Pakistan	=36	54	=15	80	=34	47	38	61	=25	87	44	16
ROK	20	81	=30	60	20	72	=1	100	=13	95	21	68
Taiwan	33	60	=30	60	=18	73	42	33	=42	47	10	77

Source: *NTI Nuclear Security Index: Building a Framework for Assurance, Accountability, and Action* (Washington DC: Nuclear Threat Initiative, January 2016)

Whichever way we look at it, therefore, of all the regions in the world, the concerns are the greatest regarding Asia–Pacific when it comes to nuclear security vulnerabilities. While this is especially true of all four Asian countries that possess nuclear weapons, the non-nuclear weapon states cannot be sanguine about the threats and risks for the whole continent. Overly sensitive governments will attack the messenger with full Yes Minister-style efforts to belittle and discredit the index and NTI, casting aspersions on methodology, motives, bias, data reliability, etc. But global rankings can actually provide a very useful and convenient good governance policy tool. Sensible states will choose to make full use of the NTI *Nuclear Security Index* as a global benchmark against which to track and improve their own record.

A Post-NPT Future

From inception the normative bargain in the NPT has always been that those without nuclear weapons would not pursue that option; all States Parties would cooperate in preventing the spread of nuclear weapons to anyone else; and the NWS would enter into negotiations to get rid of their own weapons. The first part in this three-way equation has been honoured by all countries bar one (North Korea); the second part has been successful except for Israel, India and Pakistan; and the most glaring failure has been with respect to the third legal obligation to nuclear disarmament by the NWS whose spokespersons perform Olympic-quality verbal gymnastics in explaining how continued possession is in conformity with their NPT disarmament obligation.

The NPT has been subverted from a prohibition into a non-proliferation regime. The NPT definition of a NWS is neither empirical nor analytical, but chronological – a country that manufactured and exploded a nuclear device before 1 January 1967. The cases of India and Pakistan (and Israel in the Middle East) show the strategic folly of such a blinkered chronological definition. The integrity and credibility of the NPT as the overarching regime for managing the world's nuclear orders is dented by the fact that four of the nine states that possess nuclear weapons fall outside the regime. It is impossible to deal with non-NPT nuclear-armed states from within the treaty. Nor can they participate in the five-yearly NPT Review Conferences, and cannot be asked to join the NWFZ protocols even if they are regionally relevant. Furthermore, North Korea's example demonstrates the weakness of the NPT withdrawal clause. It should not be possible for a country to gain the technology and materials benefits as an NPT non-NWS, decide on an entirely unilateral calculation that withdrawal from the treaty is justified, defect and yet keep all the benefits gained during membership.

The NPT's cumulative anomalies and flaws[50] mean that we need to look beyond and perhaps outside the treaty to realize the goal of nuclear elimination. But its very real, substantial and continuing contributions to international security mean that we must not jeopardize the regime until a better replacement regime is ready. The collapse of the 2015 review conference was further evidence that the NPT has exhausted its normative potential in containing and eliminating the nuclear threat. Alexei Arbatov notes that almost all negotiations on nuclear arms reductions and non-proliferation have stalled and non-proliferation norms are softening, "existing treaty regimes are eroding and … may collapse in the near future." With "the total disintegration of the existing framework of treaties and

50 Ramesh Thakur, "NPT Regime Change: Has the Good Become the Enemy of the Best?," in Jane Boulden, Ramesh Thakur and Thomas G. Weiss, eds., *The United Nations and Nuclear Orders* (Tokyo: United Nations University Press, 2009), pp. 273–97.

regimes," Arbatov warns, the risks of and plans for the use of nuclear weapons in combat will return to prominence.[51]

The non-proliferation leg can be strengthened with the entry into force of the CTBT, although it is an open question as to whether this is better pursued by demanding signature and ratification by the Annex 2 holdout states, or amending the entry-into-force formula to bring the CTBT into line with all other arms control regimes. A cap and treaty-based freeze on fissile materials production followed by a reduction in existing stockpiles is equally urgent. So too is the universalization of the Additional Protocol and the NWS adherence to the relevant regional NWFZ protocols. Vertical proliferation by the nuclear-armed states can be checked and reversed by Russia and the US taking their warheads off high alert and Pakistan and India aborting the pursuit of tactical nuclear weapons.

The negotiation of additional regional nuclear energy regulatory arrangements and regional and global nuclear fuel banks; the adoption of international standards and benchmarks on nuclear security; the extension of the nuclear security to cover sensitive nuclear materials under military control that account for over 80 per cent of all such materials; and the universal take-up by all Asia–Pacific states with significant nuclear activities of regional and global safety and security conventions would boost confidence in the safety and security practices of the peaceful uses of nuclear energy across the continent.

The transition from a world in which the role of nuclear weapons is seen as central to maintaining national and international security, to one where they become progressively marginal and eventually unnecessary, is urgently required. The claim that nuclear weapons could not proliferate if they did not exist is both an empirical and a logical truth. The very fact of their existence in the arsenals of nine countries is *sufficient guarantee* of their proliferation to others and, some day again, use. Conversely, nuclear disarmament is *a necessary condition* of nuclear non-proliferation. In the real world, the only choice is between nuclear abolition, or cascading proliferation and guaranteed use by design or accident. Proponents of nuclear weapons are the true "nuclear romantics" who exaggerate the bombs' significance, downplay their substantial risks, and imbue them with "quasi-magical powers" also known as nuclear deterrence.

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[51] Alexei Arbatov, *An Unnoticed Crisis: The End of History for Nuclear Arms Control?* (Moscow: Carnegie Moscow Center, 2015), pp. 1, 3, 12. http://carnegieendowment.org/files/CP_Arbatov2015_n_web_Eng.pdf. Accessed 9 May 2016.