



The Urgent Need for Nuclear Risk Reduction in Asia

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Summary

In Asia, the expansion and modernization of nuclear weapons programs is occurring against a backdrop of rising strategic tensions, doctrinal dissonance, weak command and control systems and a worrying absence of crisis stability mechanisms. As a result, the potential for deadly miscalculation leading to nuclear use is growing. In particular, the nuclear rivalry between India and Pakistan, and tensions between the US (plus its allies in North East Asia) and China demand our attention. Ambiguities and competing ideas about nuclear deterrence among these nuclear-armed adversaries make it more likely that a conflict that begins as limited and conventional could spiral into a full-blown nuclear exchange. Despite these dangers, there is a high level of nuclear complacency among international elites and general publics. Urgent steps are needed to improve communication channels, raise awareness of nuclear dangers, foster cooperative approaches to security and increase support for nuclear disarmament.

Introduction¹

1. Claims that nuclear deterrence is inherently stable are less convincing today than previously.² Although decades of confidence-building

measures (CBMs) and nuclear arms control negotiations have reduced the chances for deadly miscalculation and surprise in the US–Russia strategic relationship,³ a similar depth of communication and understanding is missing in the bilateral relationships of most other nuclear-armed adversaries. This is especially troubling in Asia, where a dangerous combination of live territorial disputes, underdeveloped security architectures, political volatility, rising nationalism, nuclear and conventional arms racing, and weak command and control systems, mean that the potential for deterrence breakdown is real and growing.

2. This Policy Brief explores Asia's mismatch of nuclear doctrines which could result in a conflict, which begins as limited and conventional, rapidly spiralling into a full-blown nuclear exchange. This phenomenon, which scholars have described as "doctrinal dissonance,"⁴ is clearest in the nuclear rivalry between India and Pakistan, and tensions between the US (plus its allies in North East Asia) and China. It is also evident in North Korea's nuclear relationships, but not enough is known about Pyongyang's nuclear doctrine or operational status to include it in this discussion. Russia could have been included, but its nuclear assets are not

¹ I am grateful to Mark Fitzpatrick, Shashank Joshi and

² Sir Michael Quinlan, who was the brains behind UK nuclear strategy, was known for his belief in the "wide tolerance margins" of nuclear deterrence. He argued that these margins had begun to narrow in the post-Cold War world. See Tanya Ogilvie-White, *On Nuclear Deterrence: The Correspondence of Sir Michael Quinlan* (Abingdon: Routledge, 2011), p. 74.

³ Reduced but not eliminated. See Patricia Lewis, Heather Williams, Benoit Pelopidas, and Sasan Aghlani, *Too Close for Comfort: Cases of Near Nuclear Use and Options for Policy* (London: Royal Institute of International Affairs, 2014), pp. 1–30.

⁴ Feroz Hassan Khan and Ryan W. French, *US–Pakistani Nuclear Relations: A Strategic Survey*, PASC Report Number 2014 005 (April 2014), p. 24.

Asia-focused and therefore not as significant in the Asian regional context.⁵

The analysis that follows confirms and reinforces the conclusions that a growing number of international experts have reached: that the risks associated with nuclear weapons outweigh any utility they might have, requiring the urgent development of crisis stability mechanisms, and realistic steps towards nuclear disarmament.⁶

The India-Pakistan Nuclear Relationship

3. The adversarial relationship between India and Pakistan is the most likely of all nuclear standoffs to result in deterrence breakdown. This is partly because the level of doctrinal dissonance in South Asia is so great: on one side, India has conventional superiority and maintains a comparatively modest declaratory nuclear doctrine; on the other, Pakistan is conventionally weaker and seeks security through nuclear deterrence and the threat of first use.⁷ This combination of nuclear doctrines creates inherent risks of miscalculation, which could trigger an escalatory spiral leading to nuclear war. Weak command and control and inadequate crisis stability mechanisms compound these risks.

India's Nuclear Posture

4. India maintains civilian control over its nuclear weapons arsenal, which is thought to be between 90 and 110 strong, with nuclear warheads routinely stored separately from missiles.⁸ Its nuclear policy, originally declared in

1998 and 1999 and adjusted in 2003, is that India will not be the first to use nuclear weapons against other nuclear-armed states, and will not threaten to use them against non-nuclear countries.⁹ Although it espouses a policy of no-first-use, in fact that is qualified in that India retains the option to use nuclear weapons against any state that conducts an attack on India with nuclear, chemical or biological weapons at any time or place. If such an attack occurred, India's declaratory doctrine suggests that its retaliation would be massive and designed to inflict unacceptable damage.

5. Successive Indian governments have claimed that their country's nuclear posture is based on moderation and on a credible minimum deterrent. But India's nuclear weapons activities are not as moderate as its leaders claim: India is seeking a force structure that is as diverse as that of the US and Russia.¹⁰ Although its nuclear arsenal is still relatively small, New Delhi is currently expanding its production of nuclear weapons materials, warheads and missiles, and is developing more sophisticated nuclear capabilities, including nuclear-capable cruise missiles, submarine-launched ballistic missiles, and MIRV technology (the capacity to carry multiple warheads aimed at different targets).¹¹ India also recently launched several military and surveillance satellites and seems to be getting drawn into an anti-satellite weapons and ballistic missile defence race.¹² In June 2014, analysts at Jane's and SIPRI suggested that a massive expansion of India's production of highly enriched uranium (HEU), which is expected to begin in 2015, could indicate that India is planning to develop thermonuclear weapons.¹³ On top of all of this, New Delhi is

⁵ For further discussion of Asian nuclear dyads, see Stephen J. Cimbala, "Nuclear Weapons in Asia: Perils and Prospects," *Military and Strategic Affairs* 6: 1 (March 2014), pp. 19–41.

⁶ *Weapons of Terror: Freeing the World of Nuclear, Biological and Chemical Arms* (Stockholm: The Weapons of Mass Destruction Commission, 2006); *Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers* (Canberra: International Commission on Nuclear Non-Proliferation and Disarmament, 2009); and Gareth Evans, "Nuclear Deterrence in Asia and the Pacific," *Asia and the Pacific Policy Studies* 1:1 (2014), pp. 91–111.

⁷ For an introduction to nuclear dynamics in South Asia, see Ramesh Thakur, "What Did India Gain by Getting the Bomb?" APLN/CNND Policy Brief No. 7 (Canberra: Centre for Nuclear Non-Proliferation and Disarmament, November 2013), and Pervez Hoodbhoy and Zia Mian, "Changing Nuclear Thinking in Pakistan," APLN/CNND Policy Brief No. 9 (Canberra: Centre for Nuclear Non-Proliferation and Disarmament, February 2014).

⁸ *SIPRI Yearbook 2014* (Oxford: Oxford University Press, 2014).

⁹ "Cabinet Committee on Security Reviews Progress in Operationalizing India's Nuclear Doctrine," Press Release, Prime Minister's Office, New Delhi, 4 January 2003.

¹⁰ Vipin Narang, "Five Myths About India's Nuclear Posture," *The Washington Quarterly* 36:3 (Summer 2013), pp. 143–57; Hans M. Kristensen and Robert S. Norris, "Indian Nuclear Forces, 2012," *Bulletin of the Atomic Scientists Nuclear Notebook*, 30 May 2013.

¹¹ Gulshan Luthra, "DRDO Fires on Towards MIRV Capability," *India Strategic* (April 2013), http://www.indiastrategic.in/topstories1978_DRDO_fires_on_towards_MIRV_capability.htm.

¹² Praful Bidwai, "India's Nuclear Weapons Programme: The Myth of Moderation," Heinrich Boell Stiftung, 3 March 2014.

¹³ Zachary Keck, "Is India Building Thermonuclear Weapons?" *The Diplomat*, 21 June 2014.

continuing the major expansion of its conventional forces.¹⁴

6. Declaratory nuclear doctrine is the element of India's nuclear posture that *has* remained relatively moderate despite this nuclear expansion, but this is under pressure on two fronts: first, China's massive military expansion and modernization program and uncertainties over whether its no-first-use doctrine will hold; second, Pakistan's rapid nuclear expansion, including its accelerated plutonium and HEU production, and its development of short-range nuclear-capable missiles for battlefield use. These developments have prompted some Indian commentators to call for a major review of India's nuclear doctrine,¹⁵ for it to drop its qualified no-first-use pledge,¹⁶ and even for it to adopt a policy of flexible response, including the development and introduction of tactical nuclear weapons on India's side of the border.¹⁷ Others argue that India should retain its current doctrine – because the threat of massive retaliation will prevent Pakistan and China from crossing the nuclear threshold, but only if India is able to enhance the credibility of its nuclear doctrine by improving its second-strike capabilities and clearly signalling its political resolve.¹⁸ India's new Prime Minister, Narendra Modi has stated that his government is not planning to review India's nuclear doctrine and that no-first-use and “moderation” will continue, but he has also made it clear that he intends to strengthen India's defence.¹⁹

¹⁴ India became the biggest importer of US conventional weapons in 2013 and has one of the world's largest naval building programs. India was the world's ninth biggest military spender in 2013 (the US was first, China second). For more information, see *Trends in World Military Expenditure, 2013*, SIPRI Fact Sheet, April 2014, p. 2; David Pilling, “Asia Follows China into an Old-Fashioned Arms Race,” *Financial Times*, 2 April 2014.

¹⁵ P. R. Chari, “India's Nuclear Doctrine: Stirrings of Change,” Carnegie Endowment for International Peace, 4 June 2014.

¹⁶ Lt.-Gen. B.S. Nagal (ret'd), “Checks and Balances,” *Force* (June 2014), http://www.forceindia.net/Checks_and_Balances.aspx; Abhijit Iyer-Mitra, “India's Nuclear Imposture,” *The New York Times*, 11 May 2014.

¹⁷ Jaideep A Prabhu, “India's Nuclear Indecision,” *South Asian Idea*, 5 May 2014.

¹⁸ Manpreet Sethi, “India and No First Use: Preventing Deterrence Breakdown,” IPCS article #4393, 21 April 2014.

¹⁹ No Review of Nuclear Doctrine, Says Modi,” *The Hindu*, 29 August 2014; Prabhu, “India's Nuclear Indecision.”

Pakistan's Nuclear Posture

7. Pakistan's current arsenal size is estimated in the open literature to be between 100 and 120 nuclear weapons. The storage status of these weapons in peacetime has not been officially revealed, but reports suggest that warheads are stored separately from their delivery systems, with the triggering mechanisms removed. Even if this is still the case (the status might have changed since Pakistan introduced tactical nuclear weapons²⁰) the components are believed to be stored at military bases and could be put together at short notice (as could India's). The fact that the military plays a central role in Pakistan's command and control structure increases these concerns, prompting questions over whether, in an escalating crisis, nuclear weapons might be used without authorization from the civilian leadership.²¹ According to some reports, launch authority was delegated to Pakistani field commanders during the 1999 Kargil War.²²

8. Pakistan reserves the right of first-use and bases its nuclear posture on “minimum credible deterrence” whereby the number of weapons necessary to provide minimum deterrence depends on Pakistan's security environment.²³ Beyond this, Pakistan's leaders refuse to explicitly declare nuclear redlines, instead preferring to encourage uncertainty. Pakistan's defence thinkers believe that this uncertainty has a strong deterrent effect, forcing Indian decision makers to second guess when, where and under what circumstances Pakistan would use nuclear weapons.²⁴ They also believe opacity gives them more flexibility, avoiding the strategic dilemma India would face if its doctrine of massive retaliation was ever put to the test.

²⁰ This has been widely predicted. See, for example, Daniel Painter, “A Nuclear Pact just Right for India and Pakistan,” *IISS Voices*, 13 December 2012.

²¹ Pakistan's National Command Authority (NCA) is composed of both civilian and military officials, but some experts have argued that, during a crisis, authority could be delegated to a local commander. For a discussion of these concerns and the official rejection of them by the Strategic Plans Division, see Mark Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers* (Abingdon: Routledge, 2014), pp. 87–90.

²² See, for example, Timothy D. Hoyt, “Pakistani Nuclear Doctrine and the Dangers of Strategic Myopia,” *Asian Survey*, 41/6 (November/December 2001), p. 966.

²³ Adil Sultan, “Pakistan's Emerging Nuclear Posture: Impact of Drivers and Technology on Nuclear Doctrine,” Institute of Strategic Studies Islamabad, 17 April 2012, p. 156, http://www.issi.org.pk/publication-files/1340000409_86108059.pdf.

²⁴ Khan and French, *US–Pakistani Nuclear Relations*, p. 25.

9. Pakistan is in the process of expanding its nuclear arsenal as fast as it can.²⁵ It is not only expanding its fissile material production and developing a sea-based deterrent (in common with India), it has also developed short-range tactical nuclear weapons designed for battle-field use. The decision to introduce them seems to have been driven by an awareness that the conventional balance has shifted even further in India's favour; and by concerns that a nuclear deterrent composed solely of high-yield, city-busting warheads lacks credibility against a limited conventional attack. Pakistan's military believes the introduction of the tactical nuclear weapons provides it with a full-spectrum deterrent against India, but little is known about the precise conditions that would prompt a nuclear attack. Some vague thresholds have been suggested, which indicate Pakistan might consider many different types of external aggression to be grounds for nuclear retaliation, including economic strangulation and domestic destabilization.²⁶

Risks of Deterrence Breakdown in South Asia

10. Outside of a handful of people in Pakistan, no one knows the extent to which Pakistan's nuclear assets are vulnerable to sabotage or theft by non-state actors (potentially including insiders with jihadist sympathies in the military), which is a major preoccupation of the international community.²⁷ Besides these understandable concerns, there are also very serious risks of state-led deterrence breakdown in South Asia, including as a result of an escalating dispute initially triggered by a cross-border terrorist incident.²⁸ Doctrinal differences and uncertainties are causing nervousness on the subcontinent, as the neighbours try to fathom each other's nuclear strengths and

weaknesses and the potential for nuclear use. Indian strategists (including former Indian Strategic Forces Commander, B. S. Nagal²⁹) fear that their own country's qualified no-first-use doctrine has led Pakistan to become too confident: they worry Pakistan might be tempted to use tactical nuclear weapons in a war termination role, on the basis that India's doctrine of massive retaliation lacks credibility. For their part, Pakistan's military planners face a constant command and control dilemma, fearing that their heavily-guarded nuclear storage sites could be readily identified by satellites, making them vulnerable to disarming conventional missile strikes.³⁰ The dictates of deterrence therefore mean that some movement of weapons and launchers from fixed locations would be necessary in a crisis, which could be misinterpreted by India as an aggressive act and would also make the weapons more vulnerable to non-state threats.³¹

11. These are extremely dangerous scenarios, particularly in the strategic environment of South Asia. First, as Ramesh Thakur notes, contiguity permits India and Pakistan to meddle inside each other's territory on a scale that is highly destabilizing.³² The non-state dimensions of this meddling, including the blurring of lines between state and non-state action, increase the potential for misunderstandings to occur and spiral out of control.³³ Second, the conventional military doctrines of both countries emphasize rapid mobilization and high intensity warfare, and misunderstandings have threatened to escalate into unwanted wars in the past.³⁴ In the event of future cross-border hostilities, miscalculation could lead to swift escalation and nuclear war.

12. Despite domestic pressure, India has so far resisted calls to abandon its qualified no-first-use doctrine. Its response to nuclear developments across its borders has been to enhance stability through reinforcing its second-strike

²⁵ Hoodbhoy and Mian, "Changing Nuclear Thinking in Pakistan," p. 1.

²⁶ Iram Khalid, "Nuclear Security Dilemma of Pakistan," *Journal of Political Studies* 20:1 (2013), p. 16; Scott D. Sagan, "The Evolution of Pakistani and Indian Nuclear Doctrine," in Scott D. Sagan, ed., *Inside Nuclear South Asia* (Stanford CA: Stanford Security Studies, 2009), pp. 24–25.

²⁷ See, for example, Christopher Clary, "Thinking About Pakistan's Nuclear Security in Peacetime, Crisis and War," IDSA Occasional Paper No. 12 (September 2010); Paul K. Kerr and Mary Beth Nikitin, *Pakistan's Nuclear Weapons: Proliferation and Security Issues*, CRS Report for Congress, 19 March 2013; Shaun Gregory, "The Terrorist Threat to Nuclear Weapons in Pakistan," European Leadership Network, 4 June 2014, http://www.europeanleadershipnetwork.org/the-terrorist-threat-to-nuclear-weapons-in-pakistan_613.html.

²⁸ See Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, pp. 47–71.

²⁹ Shashank Joshi, "India's Nuclear Doctrine: The Fog Lifts," *The Interpreter*, 7 July 2014.

³⁰ Kerr and Nikitin, *Pakistan's Nuclear Weapons*.

³¹ Michael Krepon, "Complexities Of Nuclear Risk Reduction in South Asia," *The Hindu*, 29 May 2009.

³² Thakur, "What Did India Gain by Getting the Bomb?" p. 6.

³³ See Robert D. Lamb, Sadika Hameed and Kathryn Mixon, *South Asia Regional Dynamics and Strategic Concerns* (Centre for Strategic and International Studies, January 2014), pp. 18–24.

³⁴ Khan and French, *US–Pakistani Nuclear Relations*, p. 26; Hoodbhoy and Mian, "Changing Nuclear Thinking in Pakistan," p. 5.

capability, including via quantitative and qualitative missile advances and sea-based nuclear deterrence, and to seek security by building a missile defence shield. The intention has been to blunt Pakistan's first-use posture by creating enough uncertainty to induce restraint. But a major unintended consequence of this strategy has been to accelerate arms racing dynamics and increase crisis stability challenges. This is because, to prevent the blunting of its nuclear posture, Pakistan has been working on miniaturizing nuclear warheads to fit on cruise missiles, which have a very short warning time and a greater chance of evading India's missile defence systems.³⁵ Moreover, the fact that both sides are working on dual-use systems of this kind, making it possible for conventional missiles to be mistaken for nuclear ones, ups the ante significantly. This has led Michael Richardson to warn that: "if ever used, such weapons could open a Pandora's Box of horrendous consequences, proving that a limited nuclear war is a contradiction in terms."³⁶ Accidental nuclear war could also be triggered by weak command and control capabilities and low survivability of embryonic SSBN fleets – for example, in future, the inadvertent sinking of a nuclear-armed submarine could trigger a spiral of escalation regardless of the attackers' intentions.³⁷

13. Complexities stemming from relations with China augment the risk of deterrence failures in South Asia. As discussed below, China's declaratory nuclear posture is moderate, but the perception among some prominent Indian nuclear strategists, including Vijay Shankar (former Commander-in-Chief, Strategic Forces Command of India) is that China has "assiduously nurtured" Pakistan's first-use policy, despite the dangers posed by non-state actors.³⁸ According to Shankar's controversial claims,

China's actions have been motivated by a desire to gain greater flexibility in its own nuclear doctrine, allowing Beijing to use Islamabad as a proxy in its adversarial relationship with India.³⁹ But he argues that this too has backfired, undermining deterrence stability by emboldening Pakistan, increasing the pressure on India's no-first-use posture and accelerating regional arms racing, conventional and nuclear.

14. Despite some promising proposals, years of dialogue between India and Pakistan and the development of nuclear CBMs have failed to quell nuclear arms racing dynamics or significantly reduce the chances of miscalculation. The best hope of improving bilateral crisis stability was the 1999 Lahore Declaration, which contained a plan to hold high level talks on conventional and on nuclear risk reduction, but this initiative was stymied by the Kargil conflict.⁴⁰ Other CBMs have been negotiated, such as hotlines and missile launch notification mechanisms, but even these are patchy and poorly implemented and have been severed intentionally in wartime, precisely when they are most needed. Part of the problem is the "nuclear optimism" or nonchalance of political elites, who seem unwilling to learn the lessons of the Cold War or absorb information that challenges "established wisdom" on deterrence stability.⁴¹ Zero-sum thinking among decision makers appears to be another obstacle to focused dialogue: India, which has conventional superiority, favours keeping nuclear and conventional dialogues separate and insulated from territorial issues; while Pakistan views nuclear and conventional issues as inseparable and insists they should be addressed together. As a result of these and other disagreements, India and Pakistan have not engaged in significant nuclear risk-reduction talks since 2007.

The US-China Nuclear Relationship

15. Volatilities in India-Pakistan strategic relations pose the highest risk of deterrence breakdown, but nuclear dangers are also growing in the US-China relationship. These include the potential for deterrence failure as a result

³⁵ Michael Richardson, "Cruise Missile Threat in Asia," *The Japan Times*, 18 June 2013.

³⁶ Richardson, "Cruise Missile Threat in Asia." Also see "Land Attack Cruise Missiles," <http://fas.org/irp/threat/missile/naic/part07.htm>; Aiden Warren, "The Pakistani Nuclear Rise: Obama's Quest for Balance," *Yale Journal of International Affairs*, 27 April 2013; and Debalina Ghoshal, "India: Defeating the Cruise Missile Threat," *The Diplomat*, 26 October 2013.

³⁷ Military analyst Iskander Rehman describes the maritime environment in South Asia as "alarmingly unstructured" and warns of the dangers of Pakistani naval brinkmanship. Quoted in Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, p. 91.

³⁸ Vijay Shankar, "India-Pakistan-China: Nuclear Policy and Deterrence Stability," IPCS Article No. 4331, 10 March 2014.

³⁹ This is a highly questionable claim, but it is worthy of note given the author's position as former Commander-in-Chief of Strategic Forces Command of India.

⁴⁰ For more details, see: "Confidence-Building and Nuclear Risk Reduction Measures in South Asia," <http://www.stimson.org/research-pages/confidence-building-measures-in-south-asia/>.

⁴¹ Fitzpatrick, *Overcoming Pakistan's Nuclear Dangers*, p. 155.

of direct, bilateral hostilities, and the potential for the US to get caught up in an escalating regional conflict as a result of its alliance commitments in North East Asia.

16. The nuclear postures of China and the US are sharply contrasting: China's force size and declaratory nuclear doctrine is the most moderate of the nuclear-weapon states, while that of the US, despite recent reductions, is still based on a full-spectrum nuclear triad and high alert status. These differences increase the chances of misunderstanding and miscalculation that could cause deterrence to fail, especially in the absence of clear channels of communication.

China's Nuclear Posture

17. Beijing has a long-standing policy that it will not be the first to use nuclear weapons at any time and under any circumstances, and will not use or threaten to use nuclear weapons against non-nuclear-weapon states or nuclear-weapon-free zones. Moreover, in the interests of preventing nuclear accidents and enhancing crisis stability, China is widely believed to store its nuclear warheads separately from its ballistic missiles.⁴² China claims that this nuclear posture, which its officials refer to as a "nuclear strategy of self-defence," is deeply rooted in its defensive strategic culture, the goal of which is to "lower the threat of nuclear weapons, reduce the risks of nuclear war, and prevent the proliferation of nuclear weapons."⁴³ In line with this belief, China has urged the other nuclear-armed states to follow its example and also adopt no-first-use policies.⁴⁴

18. Putting aside the potential for misperception and miscalculation, China's nuclear posture has a clear internal logic. Chinese strategic thinkers have consistently emphasized nuclear possession rather than use and argue that the strategic utility of nuclear weapons is in their deterrence and retaliatory role – to defend against possible nuclear attacks rather than to fight or win wars.⁴⁵ To function in this limited

role, Chinese officials believe that only a small number of weapons is necessary and that a no-first-use policy is less threatening and thus less risky than one that reserves the possibility of first-use. This posture helps explain China's nuclear opacity as well as its apparent moderation and restraint: officials are willing to disclose the existence of systems to demonstrate that China has the capacity to retaliate in the event of a nuclear attack, but details about the number, basing mode and alert status are withheld to protect the survivability of the small nuclear force.

19. Despite this consistently moderate declaratory policy, some observers question China's nuclear posture.⁴⁶ Beijing's lack of transparency inevitably fuels this suspicion, whether or not it is justified. For example, there has been speculation that China has a much larger strategic nuclear force than the generally accepted estimate of 240-250 nuclear warheads. In 2011, US analyst Philip Karber warned that China could have as many as 3000 nuclear weapons concealed in an extensive system of underground tunnels.⁴⁷ However, US-based experts pointed out at the time that the available evidence did not support his conclusions, due to the limited amount of HEU and plutonium that China has available for nuclear weapons production.⁴⁸ Since then, some Russian experts have estimated that China has around 800-900 nuclear weapons in its current stockpile available for rapid deployment and possibly an equal number in reserve or awaiting disman-

Strategy and Force Structure," *International Security* 35: 2 (2001), p. 58.

⁴⁶ Brahma Chellaney, "The India-China-Pakistan Strategic Triangle and the Role of Nuclear Weapons," *IFRI Proliferation Papers* (Winter 2002), p. 22; George Perkovich, "The Nuclear and Security Balance," in Francine R. Frankel and Harry Harding, eds., *The China-India Relationship: What the United States Needs to Know* (New York: Columbia University Press, 2004), pp. 211-12.

⁴⁷ Philip Karber, "Strategic Implications of China's Underground Great Wall," 11 September 2011, http://fas.org/nuke/guide/china/Karber_UndergroundFacilities-Full_2011_reduced.pdf; "US Worries over China's Underground Nuclear Network," *Times of India*, 15 October 2011.

⁴⁸ See, for example, Hans M. Kristensen, "No, China Does Not Have 3,000 Nuclear Weapons," FAS Strategic Security Blog, 3 December 2011. Despite such scepticism, the 2013 US National Defense Authorization Act calls for a study of the Chinese tunnels and an assessment of the US capability to attack them. Chinese analysts do not dispute the existence of the tunnels (which are under the control of the Second Artillery Corps), but argue that their function is to increase the survivability of China's nuclear arsenal and not to conceal additional weapons.

⁴² Phillip Schell and Hans M. Kristensen, "Chinese Nuclear Forces" in *SIPRI Yearbook 2013* (Oxford: Oxford University Press, 2013).

⁴³ Report submitted by China on Implementation of the NPT, April 2014, p. 3.

⁴⁴ In January 1994, China presented a draft Treaty on No-First-Use of Nuclear Weapons to the other nuclear-weapon states.

⁴⁵ M. Taylor Fravel and Evan S Medeiros, "China's Search for Assured Retaliation: The Evolution of Chinese Nuclear

tlement.⁴⁹ These claims have also been widely disputed by experts outside Russia. Evidence does suggest, however, that a significant program of nuclear weapons expansion and modernization is currently underway, which adds credibility to predictions that China will increase its arsenal of nuclear weapons to around 400 by 2020-25, primarily to counter advances in US missile defence capabilities.⁵⁰

20. In addition to ongoing questions about arsenal size, scepticism exists over China's no-first-use pledge. Chinese strategists, including high-ranking military leaders, have questioned whether it would hold in a crisis, particularly if the US strikes Chinese nuclear assets with precision-guided conventional missiles.⁵¹ Indeed, technological advances in US conventional weapons capabilities and debates on Conventional Prompt Global Strike (CPGS) are a major driver of China's nuclear and conventional military modernization programs (even though it is unclear whether CPGS projects will receive funding) and are the primary topic of concern among Chinese strategic thinkers.⁵² These concerns, which have been elaborated in Chinese military texts, are occasionally seized upon by Western scholars as evidence of an impending policy shift.⁵³ Speculation of this kind increased in 2013, when China released a new Defence White Paper, which for the first time omitted language on no-first-use.⁵⁴

21. Doubts and speculation regarding China's nuclear posture and doctrine are understandable in the context of China's growing regional assertiveness and military expansion. Chinese

officials and scholars continue to insist that China remains committed to no-first-use;⁵⁵ argue that first-use policies are destabilizing and damage the nuclear taboo; and regard US questioning on this issue as unjustified and hypocritical.⁵⁶ But that questioning is likely to continue, fuelled by China's lack of transparency and the ambiguities generated by internal debates within China on how first-use and no-first-use should be defined in a world of rapid technological change, including improvements across the board in US missile defence, conventional precision strike, intelligence, surveillance and reconnaissance.⁵⁷

US Nuclear Posture

22. The US nuclear posture is very extensive in comparison to China's and is also the most transparent of all the nuclear-armed states. Washington possesses around 7700 nuclear weapons, of which 1585 are operationally deployed across its land-sea-air triad.⁵⁸ Reductions in the US nuclear arsenal (down 85 per cent since the Cold War peak), are currently occurring under New START, and in 2013 US officials expressed a willingness to negotiate further bilateral reductions with Russia of up to one-third.⁵⁹ Consistent with this downward trend, the US claims that its policy is not to develop new nuclear weapons and that life extension programs for its nuclear warheads will not support new military missions or provide for new military capabilities for nuclear weapons. However, this is a questionable claim, given

⁴⁹ Alexei Arbatov and Vladimir Dvorkin, *The Great Strategic Triangle* (Moscow: Carnegie Moscow Center, 2013), pp. 10–12.

⁵⁰ Chu Shulong and Rong Yu, "China: Dynamic Minimum Deterrence," in Muthiah Alagappa, ed., *The Long Shadow: Nuclear Weapons and Security in 21st Century Asia* (Stanford: Stanford University Press, 2008), p. 171; "China 'Increasing Number of Missile Warheads'," *South China Morning Post*, 4 August 2014.

⁵¹ For example, see Rong Yu and Peng Guangqian, "Nuclear No-First-Use Revisited," *China Security* 1:1 (Winter 2009), pp. 85–86.

⁵² *Nuclear Weapons and US-China Relations: A Way Forward*, Report of the PONI Working Group on US-China Nuclear Dynamics (March 2013), p. 31.

⁵³ Rachel Oswald, "US-China Nuclear Talks Stymied by Distrust and Miscommunication," *The Atlantic* (October 2011).

⁵⁴ James M. Acton, "Is China Changing its Position on Nuclear Weapons?" *The New York Times*, 18 April 2013. Many analysts rejected these claims. For a Chinese rebuttal, see Yao Yunzhu, "China Will Not Change its Nuclear Policy," *PacNet*, 23 April 2013.

⁵⁵ At the 2013 Shangri-la Dialogue, General Qi Jianguo, Deputy Chief of the PLA Staff, emphasized that China will not change its NFU pledge.

⁵⁶ Li Bin and Nie Hongyi, "An Investigation of China-US Strategic Stability," English translation by Gregory Kulacki of an article published in Chinese in *World Economics & Politics* 2 (2008), pp. 13–19.

⁵⁷ Chinese analysts are particularly concerned about US Asia-Pacific missile defence systems. Wu Riqiang, for example, argues that the deployment of US early-warning radars in East Asia could enhance the US capability to detect and intercept China's intercontinental missiles, eroding Beijing's second strike capability. Wu Riqiang, "China's Anxiety About US Missile Defence: A Solution," *Survival* 55:5 (October 2013), pp. 29–52.

⁵⁸ The US dramatically increased its stockpile transparency in May 2010 when, for the first time, it released its nuclear stockpile totals from 1962 to 2009, and annual totals of nuclear weapons dismantled from 1994 to 2009. For the most recent aggregate numbers, see US Department of State Fact Sheet on New START Treaty Aggregate Numbers of Strategic Offensive Arms, 1 April 2014.

⁵⁹ Prospects for these cuts were not good even before the deterioration of US-Russian relations following events in Ukraine. Russian officials have insisted that further cuts will have to be taken via a multilateral arms control process, which is likely to be much more difficult.

that the new variant of the B61 (the B61-12) will be deployable using new fighter jets and strategic bombers. This multitasking capability has led Hans Kristensen of the Federation of American Scientists to describe it as an “all-in-one nuclear bomb on steroids” – a point that will not be lost on China.⁶⁰

23. In contrast to China’s limited nuclear posture, the stated purpose of the US arsenal is to deter attack on and defend the vital interests of the United States and its allies and partners.⁶¹ To achieve this, the official US policy is to “maintain a credible deterrent with the lowest possible number of nuclear weapons” consistent with “current and future security requirements.” The US does not clarify the specific conditions in which they would be used, but does emphasize that the conditions would have to be “extreme” and that it would not use or threaten to use nuclear weapons against non-nuclear weapon states that are party to the NPT and in compliance with their non-proliferation obligations. The unclassified summary of the most recent presidential guidance on US nuclear strategy also prioritizes the deterrence of nuclear-armed regional actors, and strongly emphasizes counterforce targeting (attacking an adversary’s military infrastructure) while minimizing damage to civilian populations and objects.⁶²

24. The US believes that post-Cold War nuclear deterrence has much narrower margins of stability, due to the increase in nuclear-armed states, different approaches to nuclear deterrence and the risks posed by fragile states and non-state actors, among other challenges. In response, it has been adjusting its nuclear posture to reduce risks and increase the prospects for crisis stability. A key step has been the de-MIRVing of its intercontinental ballistic missiles (ICBMs), which has recently been completed.⁶³ This is intended to reduce the incentives for adversaries to launch a first strike on the US (because de-MIRVing reduces the con-

centration of deployed warheads). The US also keeps its nuclear-capable aircraft off day-to-day alert, targets its weapons that are on high alert at the open ocean (to reduce the impact of an accidental launch), and has been making new investments in command and control systems. According to the US 2014 NPT PrepCom report, the Department of Defense is also examining options to reduce the role of “Launch on Warning” in US nuclear planning.⁶⁴

25. Washington’s desire to reduce nuclear dangers has stopped short of major doctrinal change, such as a sole-purpose declaration or no-first-use pledge. Like the UK, the US considers the latter as meaningless at best (their views are coloured by their Cold War experience, when the Soviet Union used a false no-first-use policy as a political weapon). A sole-purpose policy (restricting its nuclear posture to deter nuclear threats alone) is regarded by US political leaders and officials as more credible and potentially more stabilizing, but they have not adopted it nor signalled when they are likely to do so. A major obstacle, according to reports, is the concern of US allies – particularly Japan – which believe that their security would be undermined by a US sole-purpose declaration (more on this below).

Risks of Deterrence Breakdown in North East Asia

26. Doctrinal differences in the nuclear postures of China and the US can be explained by the distinct historical legacies of their nuclear weapons programs, as well as their different strategic cultures and security environments. In common with the India-Pakistan nuclear relationship, these differences, when combined with territorial disputes, rising nationalism, mistrust and a lack of constructive engagement, make achieving nuclear stability extremely difficult, increasing nuclear risks. Indeed, there have already been instances of misunderstandings that had the potential to escalate.⁶⁵

⁶⁰ Quoted in Markus Becker and Otfried Nassauer, “Nuclear Arsenal: US to Turn Old Bombs into All-Purpose Weapons,” *Spiegel Online*, 6 November 2013.

⁶¹ Report submitted by the USA on Implementation of the NPT, April 2014, pp. 3–4.

⁶² *Report on Nuclear Employment Strategy of the United States Specified in Section 491 of 10 U.S.C.* (Washington DC: US Department of Defence, June 2013), pp. 4–5.

⁶³ Submarine-launched ballistic missiles (SLBMs) are generally considered to be invulnerable to attack, and so do not generate the same concerns. US SLBMs have not been de-MIRVed.

⁶⁴ Report submitted by the USA on Implementation of the NPT, p. 5.

⁶⁵ In 2001, for example, a US reconnaissance plane collided with a Chinese fighter jet, killing the Chinese pilot and forcing the US aircraft to land on Hainan Island. In 2009, the US Navy was shadowed by Chinese ships, after the Chinese suspected the US vessel of conducting surveillance for anti-submarine warfare activities. See Jeffrey Lewis, “China’s Nuclear Idiosyncrasies and Their Challenges,” *IFRI Proliferation Papers* No. 47 (November–December 2013), pp. 23–24.

27. To grasp the nature and extent of these dangers, it helps to understand some of the difficulties involved in crisis messaging; a core component in all deterrence relationships. This is the signalling of resolve among adversaries: doing (or pretending to do) X, to try to prevent or stop an adversary doing Y. The possibility of miscalculation and inadvertent escalation in such situations is much higher where doctrinal ambiguities and poor communication mean that neither side really has the other's measure. In the US-China case, it is possible to foresee circumstances in which miscalculation could occur during a crisis, leading a conventional conflict to escalate into a nuclear war. Bluffing tactics, which are common in Chinese strategic thinking, are a particular hazard.⁶⁶ For example, steps by China to simulate the replenishment of its liquid-fuelled missiles (to intimidate the US during a maritime dispute) could be misinterpreted as genuine pre-mobilization, prompting the US military into action.

28. Once China's sea-based nuclear deterrent becomes operational (as expected by the end of 2014), these dangers will grow.⁶⁷ For example, a decision by China to put its submarines to sea in an escalating crisis could easily be misinterpreted by the US and/or its allies as an act of aggression. Even if China adopts continuous-at-sea deterrence, the potential for dangerous escalation could still exist if the submarine commanders lack the ability to communicate with national command on land. It is not difficult to imagine a scenario in which a submarine commander loses contact, Beijing mistakenly concludes that the submarine has been sunk by enemy action, and the leadership decides to activate its land-based nuclear forces in a way that would be seen by the US as preparation to launch.⁶⁸ In light of these risks, reports that China is not investing in the command and control and other communications capabilities necessary for sea-based nuclear deterrence are worrying.

29. US extended deterrence relationships in North East Asia complicate US-China communication challenges, because the actions and expectations of US allies in North East Asia add layers of complexity, creating more opportuni-

ties for serious misunderstandings. In common with all positive security assurances that Washington provides, the US has never clearly stated the circumstances in which it is prepared to use nuclear weapons to defend its allies. Yet Japan and South Korea have both made it clear that they regard US nuclear assurances as having an important role to play in deterring all WMD threats as well as major conventional ones.⁶⁹ Seoul and Tokyo are both nervous about the diminution of the US nuclear posture signalled by the 2010 Nuclear Posture Review, talk of sole purpose and discussion of further cuts that go beyond New START. Despite regular assurances by US leaders, these allies have sensed that the gaps are growing between their own expectations of extended deterrence and those of the US.⁷⁰

30. For the past few years, since before the US "pivot" or "rebalance" got underway, US interlocutors have been trying to clarify and align these expectations via bilateral deterrence dialogues, which have discussed nuclear restraint and conventional deterrence.⁷¹ The goal has been to engage and reassure allies, reduce proliferation pressures and enhance regional stability. But Chinese analysts have been misinterpreting these discussions as auguring an expansion of US nuclear doctrine to include a range of conventional conflict scenarios in the East and South China Seas. They argue that the signalling of nuclear resolve by the US on behalf of regional allies involved in maritime disputes would be interpreted by China as coercion and blackmail rather than deterrence, and could be a catalyst for wider conflict.⁷² The uncertainty surrounding this and other issues of contention is causing tensions to flare and mistrust to fester on all sides, as demonstrated during the 2014 Shangri-la Dialogue, when Chinese Lieutenant-General of the People's

⁶⁶ See Lt.-Gen. Zhao Xijun's ideas on intimidation warfare techniques, discussed in PONI, *Nuclear Weapons and US-China Relations*, pp. 32–33.

⁶⁷ Hans M. Kristensen, "China SSBN Fleet Getting Ready – But For What?" 25 April 2014, <http://fas.org/blogs/security/2014/04/chinassbnfleet/>.

⁶⁸ Lewis, "China's Nuclear Idiosyncrasies."

⁶⁹ Nobuyasu Abe and Hirofumi Tosaki, "Untangling Japan's Nuclear Dilemma: Deterrence Before Disarmament," and Hyun-Wook Kim, "US Extended Deterrence and the Korean Peninsula," both in Rory Medcalf and Fiona Cunningham, eds., *Disarming Doubt: The Future of Extended Nuclear Deterrence in East Asia* (Sydney: Lowy Institute, 2012).

⁷⁰ See the report of the 8th Japan-Australia Track 1.5 Dialogue, Tokyo, 20–21 June 2013, http://www2.jiia.or.jp/en/pdf/conference/130620eng_The_8th_Japan-Australia_Track1.5_Dialogue.pdf.

⁷¹ Regular dialogues include the US-Japan Extended Deterrence Dialogue and the US-Republic of Korea Extended Deterrence Policy Committee.

⁷² Li Bin and He Yun, "Credible Limitations: US Extended Nuclear Deterrence and Stability in Northeast Asia," in Medcalf and Cunningham, eds., *Disarming Doubt*, pp. 55–56.

Liberation Army, Wang Guanzhong accused Prime Minister Shinzo Abe of Japan of stirring up trouble and US Secretary of Defense, Chuck Hagel of engaging in coercion and intimidation that will destabilize the Asia-Pacific.⁷³

31. The potential for miscommunication leading to nuclear war is real, and escalation risks are exacerbated by mutual war planning activities: Washington and Beijing both have war plans that centre on the need to strike each other with speed, fury and little warning (on the basis that failing to attack before the opponent will spell defeat). As David Gompert and Terrence Kelly of RAND explain, this creates a strong incentive to act pre-emptively if war seems imminent, creating a textbook case of crisis fragility, with the most likely triggers being maritime disputes in the East and South China Seas or a declaration of independence by Taiwan.⁷⁴

32. US and Chinese strategists are aware of these dangers, but attempts to institutionalize a nuclear risk reduction infrastructure have so far failed. The most serious attempt occurred in January 2011, when US Secretary of Defense Robert Gates visited the headquarters of China's Second Artillery Corps to urge the establishment of a permanent and structured dialogue along the lines of the US-Soviet nuclear exchanges that took place during the Cold War. According to reports, Gates' proposal was rebuffed on that occasion, although both countries have since attempted to enhance mutual understanding through less structured, more wide-ranging talks and through military-to-military engagement.⁷⁵

33. Despite these efforts, including the recently-held sixth round of the US-China Strategic and Economic Dialogue, which according to the US Department of State involved a "candid, in-depth and constructive discussion on strategic security issues,"⁷⁶ bilateral exchanges on nu-

clear policy have yielded little. They have been described by Gregory Kulacki of the Union of Concerned Scientists as being akin to "chickens talking to ducks," with neither side believing or comprehending what the other is saying.⁷⁷ A bilateral 2006 agreement to write a glossary of nuclear weapons terminology with mutually accepted definitions (in four different languages) should help address this problem to some extent, but this is not much to show for more than a decade of bilateral dialogue. The major sticking points remain no-first-use and transparency: the US discredits China's nuclear doctrine as disingenuous and bemoans its secrecy, while China accuses the US of holding onto an outdated and dangerous Cold War nuclear doctrine, and resents US demands for nuclear transparency.

Recommendations

34. Pervez Hoodbhoy and Zia Mian have painted a disturbing picture of the risks of deterrence breakdown in Asia. Their nightmare scenario is that Pakistan's generals, faced with defeat, could decide to threaten nuclear war, causing tens of millions to die, the subcontinent's cities to become radioactive ruins and "a pall of smoke [to] darken the world."⁷⁸ This might sound hyperbolic to many nuclear strategists, who use the cold language of deterrence. It might even sound alarmist to the wider strategic community and to people more generally, because the horrific impact of the nuclear attacks on Hiroshima and Nagasaki are ebbing from the collective memory, and survive only vaguely in the imaginations of post-Second World War generations. But more people need to understand the reality of nuclear weapons horrors for what they are. The alternative is to allow the current situation, in which nuclear risks are downplayed or abstracted, to continue feeding dangerous nuclear arms racing dynamics. Awareness of nuclear dangers needs to dramatically increase, not just at the elite level, but throughout international society. As James Carroll succinctly put it, nuclear disarmament "is not a fanciful dream, but a hard-headed description of the one and only acceptable future that lies ahead of the human species."⁷⁹ Getting

⁷³ Remarks by Chinese Lieutenant General Wang at the Shangri-la Dialogue, Singapore, 1 June 2014, <http://www.cfr.org/asia-and-pacific/remarks-chinese-lieutenant-general-wang-shangri-la-dialogue/p33054>.

⁷⁴ David C. Gompert and Terrence K. Kelly, "US, China, and an Unthinkable War," *Los Angeles Times*, 26 August 2013.

⁷⁵ Office of the US Secretary of Defense, *Military and Security Developments Involving the People's Republic of China 2013* (Washington DC: Annual Report to Congress, 2013), pp. 61–64; James B. Steinberg and Michael O'Hanlon, "Keep Hope Alive: How to Prevent US-China Relations from Blowing Up," *Foreign Affairs* (July–August 2014).

⁷⁶ US Department of State, *US-China Strategic and Economic Dialogue Outcomes of the Strategic Track*, Media Note, 14

July 2014.

⁷⁷ Oswald, "US-China Nuclear Talks."

⁷⁸ Pervez Hoodbhoy and Zia Mian, "Speculations on the Future of Nuclear South Asia," in Pervez Hoodbhoy, ed., *Confronting the Bomb: Pakistani and Indian Scientists Speak Out* (Oxford: Oxford University Press, 2012), pp. 305–06.

⁷⁹ James Carroll, "The Next Nuclear Age Is Too Close," *The Boston Globe*, 4 August 2014.

this message out to those who are uninformed about nuclear dangers or in denial about the risks inherent in nuclear deterrence is one of the most important tasks we face.⁸⁰

35. In addition to this immense outreach task, experts need to put their minds to developing crisis stability mechanisms. Urgent steps are needed to improve communication channels, to:

1. reduce the chances that states will miscalculate and underestimate the consequences of their actions;
2. increase understanding of the nuclear dangers posed by non-state actors and the unacceptable risks associated with state-sponsored terrorism;
3. make it less likely that state actions that are intended to deter adversaries, are misinterpreted as acts of aggression; and
4. ensure that debates about strategic stability and disarmament are not seen as attempts by states to undermine each other's security.

36. In the context of the US–China nuclear relationship, where bilateral dialogue has been unproductive and marred by mistrust, it is worth exploring whether the P5 (the five permanent members of the United Nations Security Council) conferences could be expanded to include more discussion of confidence-building measures and to include India and Pakistan.⁸¹ These conferences are an important channel of communication, and should be enthusiastically supported by all states. Other forums for exchanging information should also be explored, in the interests of avoiding catastrophic misinterpretation. These could include creating new Asia–Pacific nuclear dialogues, focusing on regional crisis prevention and management: a multilateral North East Asia nuclear dialogue (perhaps on the sidelines of the East Asia Summit), and civilian and military trilateral and multilateral Track 1.5 and Track Two dialogues, with the goal of enhancing strategic understanding on complex deterrence issues. It

is also worthwhile continuing to press for nuclear risk reduction to be discussed in the bilateral US–China Strategic and Economic Dialogue.

37. In the South Asia context, influential experts need to stress that recent technological developments, including the deployment of dual-use cruise missiles, mean that nuclear risk reduction mechanisms are urgently needed. Political leaders in India and Pakistan cannot afford to play politics with nuclear dangers; they need to take ownership of reducing nuclear risks and put an end to the practice (common since 2007) of delegating nuclear dialogue to mid-level officials. Most importantly, Prime Ministers Narendra Modi of India and Nawaz Sharif of Pakistan should renew the Memorandum of Understanding that was signed at the Lahore Summit in February 1999, which pledged both countries to “take immediate steps for reducing the risk of accidental or unauthorized use of nuclear weapons and discuss concepts and doctrines with a view to elaborating measures for confidence building in the nuclear and conventional fields, aimed at prevention of conflict.”⁸² Such steps could include agreeing to and implementing a strategic restraint regime, which would include clarifying decision-making authority on both sides.⁸³

38. The focus of all nuclear-armed states should also be on negotiating a global no-first-use convention, which will remove the doctrinal dissonance in the world's most dangerous nuclear relationships and would also help with managing the increasingly difficult politics of the NPT. Admittedly, in the Asian context, no-first-use negotiations pose a difficult dilemma for the US and the international community. This is because unless US allies in North East Asia accept that the risk of deterrence breakdown outweighs any utility that nuclear weapons might have, US support for a no-first-use convention could feasibly lead them to develop their own, independent nuclear-weapons capabilities, with knock-on effects for the entire

⁸⁰ See John Page and Tanya Ogilvie-White, “Living with the Bomb: The Public and Nuclear Weapons,” APLN/CNND Policy Brief No. 13 (Canberra: Centre for Nuclear Non-Proliferation and Disarmament, June 2014).

⁸¹ The P5 (China, France, Russia, the United Kingdom, and the United States) have held a series of conferences to work towards nuclear disarmament and non-proliferation. They have met in London (September 2009), Paris (July 2011), Washington DC (June 2012), Geneva (April 2013), and Beijing (April 2014).

⁸² Lahore Declaration, 21 February 1999, <http://www.nti.org/treaties-and-regimes/lahore-declaration/>.

⁸³ Pervez Hoodbhoy and Zia Mian's proposal for Sri Lanka, Bangladesh, Nepal, Afghanistan, the Maldives and Bhutan to begin creating a South Asian nuclear-weapon-free zone, and to use this to exert disarmament pressure on India and Pakistan, is also worth exploring further. Initiatives that have been dismissed or failed in the past could become more appealing as nuclear dangers rise. Hoodbhoy and Mian, “Speculations on the Future of Nuclear South Asia,” p. 304.

nuclear non-proliferation regime.⁸⁴ Indeed, amid rising nationalism, China's increasing assertiveness in the East and South China Seas and North Korea's repeated nuclear defiance, doubts about the reliability of US deterrence have been catalysts for pro-nuclear arguments in Japan and South Korea.⁸⁵ This situation reinforces the urgent need to devalue nuclear weapons. The challenges are immense, but the priorities must be to increase awareness of nuclear risks among policy makers and civil society alike, and galvanize public action in support of a nuclear-weapon-free world.⁸⁶

⁸⁴ For an interesting debate over possible US responses to these proliferation pressures, see David Santoro, "Will America's Asian Allies Go Nuclear?" *The National Interest*, 30 January 2014, and Elbridge Colby, "Choose Geopolitics Over Nonproliferation," *The National Interest*, 28 February 2014.

⁸⁵ See Peter Hayes and Chung-in Moon, "Should South Korea Go Nuclear?" *EAF Policy Debates* No. 7, 28 July 2014; "Nuclear Arms Card for Japan," an English translation of an article that first appeared in the April 2013 issue of *Sen-taku* (a monthly magazine covering political debates in Japan), and re-published in *The Japan Times*, 29 April 2013.

⁸⁶ Page and Ogilvie-White, "Living with the Bomb."

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