



Strengthening Nuclear Security – Practical Steps for Asia Pacific Countries

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Summary

Notwithstanding the conclusion of the Nuclear Security Summits begun by President Obama in 2010, much remains to be done to strengthen nuclear security around the world. It is essential for governments to continue improving nuclear security. This requires international collaboration in ensuring high standards, best practice, accountability and so on. This is particularly important for Asia Pacific countries as this region is the world's major growth area for nuclear programs. This Policy Brief outlines a number of practical steps countries can take to strengthen nuclear security and to demonstrate that they are meeting their responsibilities.

The Need to Strengthen Nuclear Security

1. Nuclear security concerns the protection of nuclear materials and facilities, and radioactive materials, against theft, misuse or sabotage by terrorists and criminals. Specific risks include:

- (a) Theft or seizure of a nuclear weapon;
- (b) Theft or seizure of weapons-usable nuclear material — highly enriched uranium (HEU) or separated plutonium;¹
- (c) Detonation of a nuclear explosion – a stolen weapon or a device made from stolen materials;
- (d) Sabotage of a nuclear facility, causing radiation release, and also economic damage;

- (e) A “dirty bomb” — use of radioactive material and conventional explosives to spread radioactive contamination;
- (f) Cyber-attack, as part of an operation to seize nuclear materials or to sabotage a nuclear facility.

2. Because to date there have been very few terrorist incidents involving nuclear material or facilities,² it is easy to under-estimate the level of the risk. The Nuclear Security Summits begun by US President Barack Obama in 2010 have been important in raising high-level awareness of the need to strengthen nuclear security. However, following the last of these summits, in Washington in April 2016, it is essential for governments to continue improving nuclear security. The end of the summits certainly does not mean the work is done. Compared with nuclear safeguards, international arrangements for nuclear security remain weak. The key treaties are far from universal, there are no binding international standards, no international inspections, and no regularly used international reporting and accountability mechanisms.

3. Nuclear security should be a particular priority for Asia Pacific countries, given that this region is the world's main growth area for nuclear energy programs. Introduction of nuclear programs to new countries, together with an expansion in the number of nuclear sites, quantities of nuclear material, number of transport movements and number of people involved all bring increased security challenges. This is especially the case in countries where there is or

1. Separated plutonium refers to plutonium separated from irradiated fuel by reprocessing.

2. See IAEA Incident and Trafficking Database, <https://www-ns.iaea.org/downloads/security/itdb-fact-sheet.pdf>

could be significant terrorist activity. Considering these developments, it is of concern that participation by Asia Pacific countries in key nuclear security treaties is below the global average (Table 1). Clearly there is need for improvement.

National Responsibility, International Collaboration

4. It is essential for every country to have effective nuclear security to protect the public and to meet its international responsibilities. Governments must ensure they have measures in place to identify and address security weaknesses and vulnerabilities. However, countries cannot do this well if they act alone. There is a need to share international best practice, share information, and benefit from mutual assistance in professional development and capacity building. These matters require collaboration with other governments and organizations.

5. One essential step in ensuring effective security is to participate in the key treaties. Other essential steps, all involving international collaboration, include:

- (a) Ensuring that national arrangements – regulations, licensing and inspection processes, an independent regulator, and so on – meet international guidelines and best practice;
- (b) Maintaining assurance and accountability mechanisms – for example through reporting on how security guidelines are applied – so countries can assure their neighbours and the wider international community that they are maintaining appropriate standards;
- (c) External review – a commitment to invite regular peer views by the International Atomic Energy Agency (IAEA) and others (such as the World Institute for Nuclear Security – WINS), and to apply the results of such reviews.³

3. For more on these matters, see <http://www.nti.org/about/projects/global-dialogue-nuclear-security-priorities/>, and <http://www.nti.org/about/projects/global-dialogue-nuclear-security-priorities/event/may-2015-global-dialogue-meeting>.

Practical Steps Asia Pacific Countries Can Take

Participating in the December 2016 IAEA Nuclear Security Conference

6. The IAEA is convening the next Nuclear Security Conference on 5–9 December 2016, and is calling for ministerial participation. The last such conference, in 2013, was intended to be ministerial-level, but little over a quarter of the participating countries were represented by a minister. Hopefully, these conferences will be taken more seriously now that the Nuclear Security Summits have ended.

Eliminating or Minimizing Weapons-usable Nuclear Materials

7. The most effective step countries can take to counter the risk of terrorists acquiring weapons-usable material is to eliminate their holdings of these materials. Most countries in the Asia Pacific region never had, or no longer have, such materials. According to the NTI Nuclear Security Index 2016,⁴ there are now only six countries in the region that have more than one kilogram of HEU or separated plutonium, namely, Australia,⁵ China, India, Japan, North Korea and Pakistan.

8. China, India, North Korea and Pakistan all have substantial quantities of these materials in military programs (discussed below). In addition, India and Japan have substantial quantities of these materials in civilian programs, and China has plans for civilian reprocessing and use of plutonium fuels. India has civilian reprocessing and is introducing fast breeder reactors which will be net plutonium producers (producing weapons-grade plutonium). Japan has had a long-running reprocessing program, and currently holds almost 11 tonnes of separated plutonium, with another 36 tonnes held on its account in France and the UK. Japan has closed or converted HEU-fuelled research reactors, is repatriating high-fissile plutonium and HEU used in research facilities, and has closed the Tokai reprocessing plant, all positive developments. However, it is considering starting the much larger Rokkasho reprocessing plant.

9. Programs for plutonium separation, processing, transport and use, involving a number of facilities, impose particular demands for en-

4. <http://ntiindex.org/>

5. Australia has only around four kilograms in total of these materials for research purposes.

sureing effective security. It is to be hoped that countries intending to recycle plutonium will commit to technologies having inherent security features, for example, where plutonium, instead of being separated, remains in a “self-protecting” mix with highly radioactive fission products.

Participation in Key Treaties

10. It is important for countries with nuclear activities to participate in key treaties and to contribute to the development of treaty regimes. Countries without nuclear activities can also contribute by joining the key treaties: each step towards a treaty’s universalization helps persuade those remaining outside that they too should join.

11. Convention on Physical Protection (CPP). The Convention on the Physical Protection of Nuclear Material and Nuclear Facilities is the principal treaty on nuclear security. This convention originated as the 1980 Convention on the Physical Protection of Nuclear Material (CPPNM). A comprehensive amendment to strengthen the 1980 convention was agreed in 2005. The amended convention entered into force on 8 May 2016. As yet there is no established abbreviation for the amended convention: CPPNM is no longer appropriate, but CPPNMNF is too complicated. Some parties have suggested CPP (“Convention on Physical Protection”), and this abbreviation is used in this Policy Brief.

12. Participation in the CPP by the countries in the Asia Pacific region is outlined in Table 1. Of the 38 countries in this region, only 12 are parties to the CPP, and a further nine remain parties to the convention in its unamended form. Seventeen countries – over half of those in the region – remain outside the convention. These figures compare unfavourably with the global uptake: globally, 68 per cent of parties to the 1980 convention have acceded to the CPP, compared with 57 per cent for Asia Pacific countries. Globally, 53 per cent of countries are parties to the CPP, and a total of 78 per cent are parties to either the CPP or the convention in its unamended form, compared with 32 per cent and 55 per cent respectively for Asia Pacific countries.

13. Of particular concern are the countries with significant nuclear activities that remain entirely outside this key convention (namely, North Korea, Malaysia and Thailand) or have not yet acceded to the CPP (Bangladesh and the

Philippines). These countries should join the CPP as a matter of priority. It is also important for countries without nuclear activities to join the CPP, to help achieve universality and also because they must be able to ensure security of any nuclear materials that are transported through their jurisdiction. Asia Pacific countries that are parties to the CPP should do all they can to encourage and assist others to join.

14. International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT). The other important nuclear security treaty is ICSANT. As Table 1 shows, 14 Asia Pacific countries are parties to ICSANT, seven have signed but not yet ratified, and 17 have not yet signed. The proportion of Asia Pacific countries that are parties is 37 per cent, compared with 54 per cent globally. Asia Pacific countries that have not joined ICSANT should do so, and those that are parties should encourage and assist others to join.

Ensuring National Implementation Reflects International Guidelines and Best Practice

15. The basic framework for ensuring effective national security is found in the IAEA’s Fundamental Principles on nuclear security (set out in the CPP), the Annexes to the CPP, and the IAEA’s nuclear security guidelines (INFCIRC/225/Rev.5).

16. In order to guide national efforts for achieving best practice, in 2014 the three Nuclear Security Summit hosts (the US, South Korea and the Netherlands) launched the **Strengthening Nuclear Security Implementation Initiative**, which has now been issued as IAEA document INFCIRC/869.⁶ This Initiative is open for all countries to join. Joining the Initiative, and taking advantage of the opportunities for collaboration with other participating countries, is a practical step a country can take to assist it in ensuring that its national security implementation does indeed reflect international guidelines and best practice.

17. The Strengthening Nuclear Security Implementation Initiative contains four core commitments and 14 optional actions to establish and strengthen national nuclear security regimes and ensure continuous improvement in nuclear security. The core commitments are:

6. www.iaea.org/sites/default/files/publications/documents/infcircs/infcirc869.pdf. For background on the Initiative and suggestions on practical steps for countries to take, see <http://www.nsgeg.org/TSF-StrengtheningNS1015.pdf>.

- (a) Subscribe to the IAEA's Fundamental Principles⁷ (for parties to the CPP these are mandatory in any case);
- (b) Meet the intent of the IAEA's nuclear security guidelines;⁸
- (c) Commit to continuous improvement through conducting self-assessments, hosting periodic peer reviews, and acting on the recommendations of these reviews; and
- (d) Ensure that nuclear security personnel are demonstrably competent.

18. At the time of writing, 38 countries had joined this Initiative, including eight from the Asia Pacific region (Table 1). Countries with significant nuclear activities that have not yet joined the Initiative include Bangladesh, Indonesia, Malaysia, North Korea, Pakistan and Thailand. Those that have already joined should encourage and assist others to do so.

Supporting Proper Funding of the IAEA Nuclear Security Program

19. It remains a serious impediment to the IAEA's ability to assist Member States in nuclear security matters that the Member States have been unable to agree to fund the IAEA's nuclear security program at anything like its actual costs. Only around 20 per cent of the funding for this program comes from the IAEA's regular budget; the remaining 80 per cent depends on voluntary contributions. This is a wholly unsatisfactory situation for a program that is assuming ever-increasing importance, and suggests that Member States still do not appreciate how vital this work is.

20. A major step that Asia Pacific countries can take to strengthen nuclear security is to support efforts to correct this funding anomaly. Countries with significant nuclear activities should be prepared to fund an increase to the IAEA's regular budget to cover the nuclear security program. Pending agreement to this, these countries should commit to extrabudgetary contributions so the funding of this program is assured on an ongoing basis.

7. See IAEA Nuclear Security Series No. 20, http://www-pub.iaea.org/MTCD/Publications/PDF/Pub1590_web.pdf

8. INFCIRC/225/Rev.5, IAEA Nuclear Security Series No. 13, http://www-pub.iaea.org/MTCD/publications/PDF/Pub1481_web.pdf

Supporting Establishment of Regular Review Conferences for the Convention on Physical Protection

21. The action plans from the 2016 Nuclear Security Summit included a call for participants to request the IAEA, as depositary for the Convention on Physical Protection, to convene regular review conferences under this convention. A review conference is to be held in 2021, five years after entry into force of the amended convention. Further review conferences may be held every five years if requested by a majority of parties. The 2021 conference will provide the opportunity for the parties to request this.

22. The proposal for regular CPP review conferences has great potential. It is to be hoped that the parties will not only agree to these, but also to the inclusion in these conferences of a process for peer review of national implementation, along the lines of the Convention on Nuclear Safety. Asia Pacific countries should participate in preparations for the 2021 CPP review conference and support the convening of regular (five-yearly) review conferences.

Maintaining High-level Political Engagement

23. In addition to practical steps such as those that have been discussed here, it is especially important in the absence of the summits to maintain high-level political engagement on nuclear security. In the near term, this could include ministerial participation in the IAEA Nuclear Security Conferences, starting with the December 2016 conference referred to above. In the future, high level political engagement could be a key area to pursue through an Asia Pacific Nuclear Energy Community.⁹

Ensuring Strong Governance for Military Materials

24. A major gap in the current international nuclear security regime is that nuclear materials in military programs — comprising some 83 per cent of the world's HEU and separated plutonium — are excluded. This might seem understandable, because details of nuclear warheads and naval fuel are secret, and people assume military security will be effective. In fact the great majority of military materials —

9. See John Carlson, "An Asia-Pacific Nuclear Energy Community", APLN/CNND Policy Brief No. 4, June 2013, <https://cnnd.crawford.anu.edu.au/publication/cnnd/4243/policy-brief-no-4-asia-pacific-nuclear-energy-community>

some 70 per cent — are not in the form of warheads or naval fuel, but are mostly bulk materials. These materials are in storage (including stocks in excess of military requirements), or in processing, research and other uses. Apart from in some cases having classified isotopic compositions, these materials are not very much different to comparable materials in civilian programs. Many of these materials are not in military custody. As bulk materials they may be vulnerable to theft. The government concerned needs to know that the security standards for these materials are at least as strong as civilian standards for comparable materials, and other countries also need this assurance.¹⁰

25. Countries in this region with military nuclear programs — China, India and Pakistan, and also North Korea — should consider how to adapt the governance principles developed for civilian materials for application to materials in military programs. Examples include the need for independent oversight (that is, independent of the units having custody of the material), a strong security culture, defence in depth, and so on. These principles can be applied in ways that enhance national security without compromising it. Other countries should encourage those with military materials to move in this direction.

Developing Regional Collaboration

26. In June 2013 APLN issued a Policy Brief on Improving Nuclear Security Governance in the Asia Pacific.¹¹ This Policy Brief advocated a regional approach, including: joining the key treaties; assurance mechanisms such as a common national reporting system; greater use of peer reviews; strengthened collaboration; and working together on building support for regular CPP review conferences, along the lines discussed above.

10. See “Bridging the Military Nuclear Materials Gap”, NTI November 2015, http://www.nti.org/media/pdfs/NTI_report_2015_e_version.pdf?_id=1447091315

11. John Carlson, “Improving Nuclear Security Governance in the Asia Pacific,” APLN/CNND Policy Brief No. 5 (June 2013), <http://a-pln.org/wordpress/wp-content/uploads/2011/03/Policy-Brief-No.-5-Improving-Nuclear-Security-Governance-in-the-Asia-Pacific.pdf>; see also John Carlson, “Strengthening Governance for Peaceful Uses of Nuclear Energy in Asia-Pacific”, APLN/CNND Policy Brief No. 20, August 2015, <https://cnnd.crawford.anu.edu.au/publication/cnnd/6137/policy-brief-no-20-strengthening-governance-peaceful-uses-nuclear-energy-asia>

27. Pending global consensus on steps to strengthen international nuclear security governance, many practical steps could usefully be taken at a regional level on the matters outlined here. Informal mechanisms could have a significant role to play in encouraging and facilitating these actions. Asia Pacific countries are urged to address the various issues discussed here and in APLN’s 2013 Policy Brief, with the objective of promoting greater regional collaboration in pursuing what should be common nuclear security goals.

28. Participation in the Strengthening Nuclear Security Implementation Initiative (INFCIRC/869) provides another area for regional collaboration. This Initiative has a menu of actions, and countries in this region could collaborate on a common set of actions. The Initiative is an important mechanism for building issue-specific coalitions on a range of security-strengthening measures.

29. A further area for collaboration is through activities linked to the nuclear security centres of excellence. In this regard, the Chinese, Japanese and South Korean centres of excellence have already joined in establishing an Asian Regional Network on nuclear security.

30. Other opportunities for collaboration include through the Asia-Pacific Safeguards Network, which includes national authorities from a number of countries in the region. Finally, the Nuclear Security Contact Group established by the last nuclear security summit will also have a major role in promoting coordination and building support for the nuclear security agenda. Regional participants could coordinate views and activities with regard to the Contact Group.

Recommendations

31. Notwithstanding the conclusion of the Nuclear Security Summits, much remains to be done to strengthen nuclear security around the world. Nuclear security is only as strong as its weakest link – ineffective security in one country can endanger many. So-called “integrity systems” try to reverse this, such that any interlocking system of relationships and arrangements becomes as robust as its strongest link. That is what we need for nuclear security in the Asia Pacific. For this reason nuclear security cannot be treated as a solely national concern, every country has a right to assurance that effective security is being implemented by others. This requires international collabora-

tion in ensuring high standards, best practice, reporting and so on.

32. This Policy Brief outlines a number of practical steps countries can take to strengthen nuclear security and to demonstrate they are meeting their responsibilities. These steps are summarized in the following recommendations:

- (a) Participate in the December 2016 IAEA Nuclear Security Conference, if possible at Ministerial level.
- (b) Eliminate or minimize weapons-usable nuclear materials. Countries intending to recycle plutonium should commit to technologies having inherent security features.
- (c) Participate in key treaties, particularly the Convention on Physical Protection. Asia Pacific countries that are not parties to the CPP, or are parties only to the unamended form of this convention, should join as a matter of priority. This is especially the case for those with significant nuclear activities. CPP parties should do all they can to encourage and assist others to join. Asia Pacific countries that have not joined ICSANT should do so, and those that are parties should encourage and assist others to join.
- (d) Ensure that national security implementation reflects international guidelines and best practice. A practical step to doing this is to join the Strengthening Nuclear Security Implementation Initiative. Those that have already joined should encourage and assist others to do so.
- (e) Support efforts to fully fund the IAEA nuclear security program from the IAEA's regular budget.
- (f) Participate in preparations for the 2021 CPP review conference and support the establishment of regular review conferences thereafter.
- (g) Maintain high-level political engagement, through participation in the December 2016 IAEA Nuclear Security Conference, and by looking for opportunities for engagement beyond that, including consideration of an Asia Pacific Nuclear Energy Community.
- (h) Ensure strong governance for military materials. Countries in this region with military nuclear programs — China, India and Pakistan, also North Korea — should consider how to adapt the governance principles developed for civilian materials for application to materials in military programs.
- (i) Participate in regional collaboration on nuclear security. There are many opportunities, including through the Strengthening Nuclear Security Implementation Initiative, the nuclear security centres of excellence, the Asia-Pacific Safeguards Network and the Nuclear Security Contact Group established at the last nuclear security summit.

Conclusion

33. As the Asia Pacific region is the major growth area for nuclear programs, it is particularly appropriate for the countries of this region to take a lead in strengthening national nuclear security and in developing regional collaboration in this regard. Readers of this Policy Brief should do what they can to encourage their governments, national authorities and industry to take the various steps outlined here.

Table 1: Asia-Pacific Participation in Key Nuclear Security Treaties and Commitments

	Convention on Physical Protection (CPP)		Strengthening Nuclear Security Implementation Initiative (INFCIRC/869)	Nuclear Terrorism Convention (ICSANT)
	Parties to the amended convention	Parties to the convention in its unamended form		
Australia	√		√	√
Bangladesh		√		√
Bhutan				
Brunei				
Cambodia		√		signed
China	√		√	√
India	√		√	√
Indonesia	√			√
Japan	√		√	√
Korea, DPR				
Korea, Rep	√		√	√
Laos		√		
Malaysia				signed
Mongolia		√		√
Myanmar				
Nepal				
New Zealand	√		√	√
Pakistan	√			
Philippines		√	√	signed
Singapore	√			signed
Sri Lanka				√
Thailand				signed
Timor-Leste				signed
Vietnam	√		√	
Cook Islands				
Fiji	√			√
Kiribati				√
Marshall Islands		√		
Micronesia				
Nauru	√			√
Niue		√		
Palau		√		signed
PNG				
Samoa				
Solomon Islands				√
Tonga		√		
Tuvalu				
Vanuatu				
Totals – 38	12	9	8	14 (+ 7 signed)
AP parties as % of AP countries	32	23	21	37
Global comparison (all parties as % of all countries)	53	25	19	53

Notes:

Countries with significant nuclear activities shown in bold.

Status of Convention on the Physical Protection of Nuclear Material and Nuclear Facilities (CPP): IAEA, 28 September 2016, http://www.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf

Status of old (unamended) Convention: IAEA 15 September 2015, http://www.iaea.org/Publications/Documents/Conventions/cppnm_status.pdf

Status of ICSANT: OECD, 20 May 2016, <https://www.oecd-nea.org/law/multilateral-agreements/international-convention-suppression-terrorism.html>

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APLN and CNND

The **Centre for Nuclear Non-Proliferation and Disarmament (CNND)** contributes to worldwide efforts to minimize the risk of nuclear-weapons use, stop their spread and ultimately achieve their complete elimination. The director of the Centre is Professor Ramesh Thakur. See further <http://cnnd.anu.edu.au>.

The **Asia Pacific Leadership Network (APLN)** comprises around seventy former senior political, diplomatic, military and other opinion leaders from fifteen countries around the region, including nuclear-weapons possessing states China, India and Pakistan. The objective of the group, founded by former Australian Foreign Minister and President Emeritus of the International Crisis Group Gareth Evans, is to inform and energize public opinion, and especially high-level policy-makers, to take seriously the very real threats posed by nuclear weapons, and do everything possible to achieve a world in which they are contained, diminished and ultimately eliminated. The co-Convenors are Professors Chung-in Moon and Ramesh Thakur. The Secretariat is located at the East Asia Foundation in Seoul, Republic of Korea. See further www.a-pln.org.

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