

PROJECT ON MANAGING THE ATOM

# India's Nuclear Safeguards: Not Fit for Purpose

John Carlson



HARVARD Kennedy School  
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## **Project on Managing the Atom**

Belfer Center for Science and International Affairs  
Harvard Kennedy School  
79 JFK Street  
Cambridge, MA 02138

**[www.belfercenter.org/MTA](http://www.belfercenter.org/MTA)**

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Photo Credit: Kirstie Hansen / IAEA

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## About the Author

Based in Australia, John Carlson advises the Nuclear Threat Initiative (NTI) leadership on international nuclear security, safeguards and verification, and management of the nuclear fuel cycle. He supports NTI's efforts in the Asia-Pacific region on nuclear security and arms reduction, and is a member of the Asia Pacific Leadership Network. Carlson is a Nonresident Fellow at the Lowy Institute, a member of the Advisory Council of the International Luxembourg Forum, and a member of VERTIC's International Verification Consultants Network. Carlson was an official in the Australian government for more than four decades.

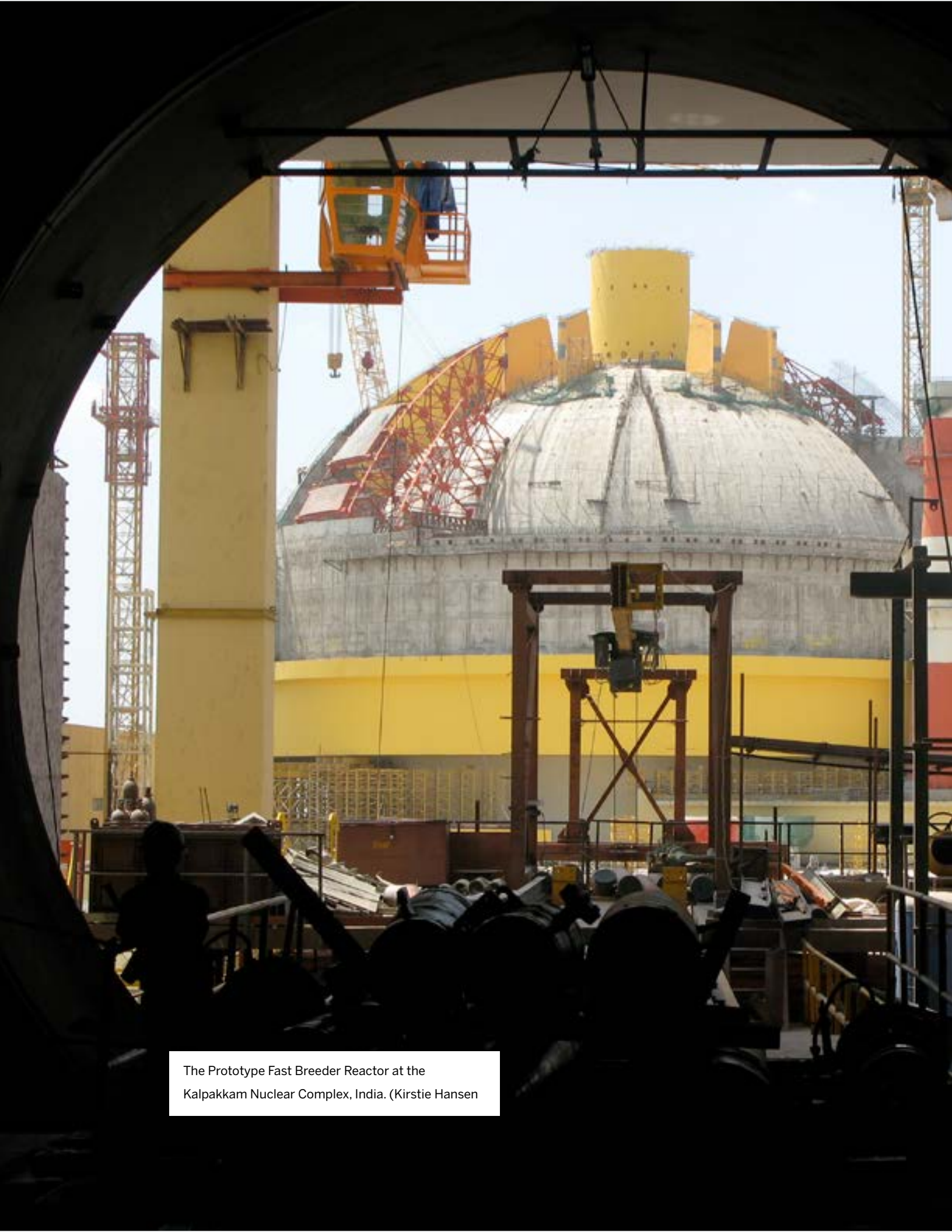
Before retiring from government, Carlson was director general of the Australian Safeguards and Non-proliferation Office. He was appointed as chairman of the Standing Advisory Group on Safeguards Implementation by former International Atomic Energy Agency (IAEA) Director General Mohammed ElBaradei and served from 2001 to 2006. He also served as Alternate Governor for Australia on the IAEA Board of Governors.

Carlson was a member of the Advisory Board of the International Commission on Nuclear Non-Proliferation and Disarmament and was founding chair of the Asia-Pacific Safeguards Network. He is a fellow of the Institute of Nuclear Materials Management and recipient of the Institute's Distinguished Service Award. Carlson has written numerous papers and presentations on nuclear nonproliferation, disarmament and verification issues. In June 2012 Carlson was awarded the national honor of Member of the Order of Australia (AM).

# Table of Contents

Acknowledgments.....	ii
About the Author.....	ii
Introduction.....	1
India’s Separation Plan.....	4
India-IAEA Safeguards Agreement.....	5
<i>Safeguarded plutonium can be substituted by unsafeguarded plutonium of lower isotopic quality. ....</i>	5
<i>Safeguarded nuclear material can be used in facilities in the unsafeguarded program. ....</i>	6
<i>Safeguarded material can be used with unsafeguarded material.....</i>	6
<i>Plutonium produced using safeguarded material in an unsafeguarded reactor can be exempted from safeguards if the proportion of safeguarded material is less than 30 percent of the total. ....</i>	6
Inconsistency with the IAEA Statute .....	8
Implications for Other States .....	9
Conclusions .....	9





The Prototype Fast Breeder Reactor at the Kalpakkam Nuclear Complex, India. (Kirstie Hansen)



# Introduction

India's current safeguards agreement with the International Atomic Energy Agency (IAEA) was concluded in 2009.<sup>1</sup> The agreement was a consequence of the Joint Statement of July 18, 2005 between Indian Prime Minister Manmohan Singh and United States President George W. Bush.<sup>2</sup> In this statement India conveyed its readiness to “assume the same responsibilities and practices ... as other leading countries with advanced nuclear technology, such as the United States,” and undertook *inter alia* to:

- identify and separate civilian and military nuclear facilities and programs in a phased manner;
- place voluntarily its civilian nuclear facilities under IAEA safeguards.

Prior to the 2009 agreement, India had a number of “item-specific” safeguards agreements with the IAEA, based on the model agreement published as IAEA document INFCIRC/66. This is a pre-NPT (Nuclear Non-Proliferation Treaty) model, intended for states requesting the application of IAEA safeguards to a specific facility or specific materials. INFCIRC/66 continues to be the model used where safeguards are applied in non-NPT states.

INFCIRC/66 has unique provisions, not seen in other safeguards agreements. INFCIRC/66 provides considerable flexibility to move nuclear material between safeguarded and unsafeguarded facilities. This flexibility may make sense where a state has a number of civilian facilities, only some of which are required to be safeguarded. However, such flexibility is inappropriate to India's current cir-

1 IAEA, “Agreement between the Government of India and the International Atomic Energy Agency for the Application of Safeguards to Civilian Nuclear Facilities,” INFCIRC/754, May 29, 2009, <https://www.iaea.org/sites/default/files/publications/documents/infcircs/2009/infcirc754.pdf>.

2 George W. Bush and Manmohan Singh, “Joint Statement by President George W. Bush and Prime Minister Manmohan Singh of India,” White House Press Release, July 18, 2005, <https://www.gpo.gov/fdsys/pkg/PPP-2005-book2/pdf/PPP-2005-book2-docpg1236.pdf>.

cumstances, where India has undertaken to separate civilian and military facilities and to place civilian facilities under safeguards. India describes the facilities remaining outside its safeguarded program not as “civilian,” but rather as “strategic.” It must be assumed this means they are or can serve a military purpose. In these circumstances a safeguards agreement that allows nuclear material to move between safeguarded and unsafe-guarded facilities cannot be considered appropriate—yet this is exactly what the 2009 agreement does.

Following on the 2005 Joint Statement, the Indian government prepared a Separation Plan to give effect to its commitment to separate civilian nuclear facilities from military facilities. The Separation Plan was presented to the Indian parliament on May 11, 2006.<sup>3</sup> In the Separation Plan India undertook to significantly increase the facilities under safeguards, extending safeguards from imported facilities and materials, which were covered by a series of INFCIRC/66 agreements, to a number of indigenous facilities which until then had been unsafeguarded. While the Plan does increase the number of safeguarded facilities in India, a large number of facilities remain outside safeguards.

Subsequently India and the IAEA commenced negotiations on a safeguards agreement to reflect the Separation Plan. In these negotiations it was decided to adopt the INFCIRC/66 model, changing it from an individual facility agreement to a generic agreement that would apply to all facilities and materials covered by safeguards. The facilities covered are to be listed in an Annex to the agreement. The Annex is to include all the facilities that India designates as “civilian” and agrees to place under permanent safeguards. The Annex is to be added to as required.

Modifying the item-specific safeguards model to apply to a list of facilities may have seemed a pragmatic solution, but on reflection it is apparent that using an old agreement—one that pre-dates the modern IAEA safeguards system—was a major mistake. Unlike the “voluntary offer” safeguards

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3 IAEA, “Communication dated 25 July 2008 received from the Permanent Mission of India concerning a document entitled “Implementation of the India-United States Joint Statement of July 18, 2005: India’s Separation Plan,” INFCIRC/731, July 25, 2008, <https://www.iaea.org/sites/default/files/publications/documents/infircs/2008/infirc731.pdf>.



agreements that apply to the NPT nuclear-weapon states,<sup>4</sup> which are based on standard NPT safeguards agreements, the 2009 agreement gives India flexibility to move safeguarded nuclear material in and out of its unsafeguarded, “strategic” nuclear program, and allows safeguarded nuclear material to be used for the production of unsafeguarded nuclear material.

As a result of this flexibility there is in fact no clear separation between facilities designated as “civilian” and facilities serving military or strategic purposes. This situation not only contradicts India’s commitment to separate its civilian and military nuclear programs and undermines the fundamental purpose of providing assurance of the peaceful use of safeguarded materials and facilities, it also appears inconsistent with the IAEA’s Statute, which requires the IAEA to ensure it does not further any military purpose.

Currently the Nuclear Suppliers Group (NSG) is considering India’s application for membership. NSG members are reportedly discussing membership criteria for states not party to the NPT. These include a requirement for clear and strict separation of current and future civilian nuclear facilities from non-civilian nuclear facilities. The NSG is right to be concerned about dual-use facilities; such facilities do not meet contemporary nonproliferation standards and can be seen as a strategic threat. Meeting this criterion would require not only amending India’s Separation Plan but also amending its IAEA safeguards agreement to remove the loophole that would allow safeguarded material and facilities to contribute to unsafeguarded activities.

This situation has implications for other non-NPT states, such as Pakistan, seeking to join the NSG. Not only would such a state need to demonstrate a clear separation between civilian and non-civilian nuclear programs; in addition, it would need to apply safeguards to the civilian materials and facilities to verify they are not being used for military purposes. The current India-IAEA safeguards agreement is not an appropriate model to apply.

In light of the deficiencies in India’s current Separation Plan, exacerbated by the problems in the 2009 safeguards agreement, it seems unlikely there will be consensus within the NSG to admit India, unless these concerns are addressed. The remainder of this paper details these issues and suggests

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4 Based on IAEA model INFCIRC/153.

steps India could take to advance its case and to avoid setting precedents that may prove contrary to its interests. The paper also discusses steps needed to protect the integrity of IAEA safeguards.

## India's Separation Plan

India's 2006 Separation Plan committed to place under IAEA safeguards 14 out of 22 power reactors then in operation or under construction, together with nominated upstream and downstream facilities (35 facilities in all). For the future, facilities would be placed under safeguards if India determines that they are "civilian."

The language used in the Separation Plan indicates that close links remain between India's civilian and military nuclear programs:

- India will include in the civilian list "only those facilities ...that, after separation, will no longer be engaged in activities of strategic significance";
- "The overarching criterion would be a judgement whether subjecting a facility to IAEA safeguards would impact adversely on India's national security";
- "However, a facility will be excluded from the civilian list if it is located in a larger hub of strategic significance, notwithstanding the fact that it may not be normally engaged in activities of strategic significance";
- "A civilian facility would therefore, be one that India has determined not to be relevant to its strategic programme."

In effect India has three classes of nuclear facilities: facilities that are declared as civilian and designated for IAEA safeguards; facilities that are functionally civilian (such as power reactors) but can be dual-use; and facilities that appear to be purely military. Facilities not designated for safeguards include eight out of the 22 power reactors referred to above (all heavy water power reactors), fast breeder reactors, and enrichment and reprocessing facilities. All of these facilities can be operated to produce

weapon-grade materials. This situation is described in greater detail in “The Three Overlapping Streams of India’s Nuclear Programs.”<sup>5</sup>

While it appears India does not consider those facilities placed under safeguards to be relevant to the “strategic program,” the relationships between the civilian safeguarded, dual-use unsafeguarded, and military programs are opaque. Under the India-IAEA safeguards agreement, civilian facilities that are unsafeguarded can be transferred into safeguards and out again on a temporary or “campaign” basis, safeguarded material can be used in normally unsafeguarded facilities, and unsafeguarded material can be used in safeguarded facilities. India has the flexibility to use both safeguarded and unsafeguarded programs to optimize fissile material production. The flexibility of these arrangements contradicts the international assurances IAEA safeguards are intended to provide.

## India-IAEA Safeguards Agreement

The major problem areas in the India-IAEA agreement, as currently drafted, are outlined as follows:

*Safeguarded plutonium can be substituted by unsafeguarded plutonium of lower isotopic quality.*

Article 30(d) allows India to substitute unsafeguarded nuclear material for safeguarded material. The agreement allows substitution based simply on element mass (weight), without taking account of isotopic composition. Safeguards are terminated on the formerly safeguarded material.

Substitution under Article 30(d) requires the IAEA’s agreement, but it is not clear on what basis the IAEA could or would withhold agreement. In the case

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5 Kalman Robertson and John Carlson, “The Three Overlapping Streams of India’s Nuclear Programs,” Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, April 2016, <https://www.belfercenter.org/sites/default/files/legacy/files/thethreeoverlappingstreamsofindiasnuclearpowerprograms.pdf>.

of enriched uranium, the IAEA has a policy requiring isotopic equivalence. Considering the explicit language of Article 30(d) for substitution on the basis of mass, however, it is not clear whether the IAEA's policy would prevail.

In the case of plutonium, as far as the author can ascertain, the IAEA has no such policy. It appears that if India produces, under safeguards, plutonium that has an isotopic quality at or close to weapon-grade, India could remove this material from safeguards and replace it with the same quantity of reactor-grade plutonium from unsafeguarded stocks. India has large unsafeguarded stocks of such material.

Plutonium removed from safeguards through substitution is available for unsafeguarded purposes. This defeats the purpose of civilian-military separation—if plutonium substitution is permitted, it should occur only between batches of similar isotopic quality, so that India could not use safeguarded facilities to add to its unsafeguarded stocks of weapon-grade plutonium.

*Safeguarded nuclear material can be used in facilities in the unsafeguarded program.*

The agreement allows India to use safeguarded material in normally unsafeguarded facilities (that is, facilities not listed in the Annex to the agreement)—see for example Articles 11(f), 14(b), 69 to 78, 84 and 94. Articles 11(f) and 14(b) provide that where India uses safeguarded material in an unsafeguarded facility, safeguards will apply to the facility temporarily while the safeguarded material is present. While this may seem satisfactory, it provides the opportunity, when combined with the exemption provisions (see below), for safeguarded material to contribute to the unsafeguarded program.

*Safeguarded material can be used with unsafeguarded material.*

The agreement allows India to use safeguarded and unsafeguarded materials together—see for example Articles 25, 95 and 96. This provides the opportunity for safeguarded material to contribute to the unsafeguarded program.

*Plutonium produced using safeguarded material in an unsafeguarded reactor can be exempted from safeguards if the proportion of safeguarded material is less than 30 percent of the total.*

Article 25 allows special fissionable material (for example, plutonium) produced through the use of safeguarded material to be exempted from safeguards provided:

- it is subject to safeguards only because it has been produced in or by the use of safeguarded nuclear material; and
- it is produced in a reactor in which the proportion of safeguarded material is less than 30 percent of total material.

The proportion of produced material corresponding to the proportion of safeguarded material will be subject to safeguards (and *vice versa*).

In “The Three Overlapping Streams of India’s Nuclear Programs” it was shown how this provision could allow safeguarded reactor-grade plutonium to be used to produce unsafeguarded weapon-grade plutonium.<sup>6</sup>

It is notable that similar provisions are not available to the nuclear-weapon states under their IAEA safeguards agreements—if a facility is eligible for IAEA safeguards (that is, it is included in the “eligible facility list” under the agreement concerned), all nuclear material in the facility is subject to safeguards. It is the case that the nuclear-weapon states’ agreements allow them to remove facilities and materials from safeguards. However, safeguarded material cannot be used outside facilities designated for safeguards. In any event, the nuclear-weapon states all ceased production of fissile material for nuclear weapons many years ago.

The agreement has a general prohibition against using items subject to the agreement for nuclear weapons or to further any other military purpose.<sup>7</sup> This seems at odds with the specific provisions allowing movement of materials to and from unsafeguarded (therefor “strategic”) facilities. In any case, once material has left safeguards the IAEA has no way of knowing whether or not it is used for nuclear weapons or other military purposes.

When the 2009 safeguards agreement was drafted, one must assume the problems outlined above were not apparent to the IAEA. Today it is clear

6 Robertson and Carlson, “The Three Overlapping Streams of India’s Nuclear Programs,” pp. 7-9.

7 IAEA, INFCIRC/754, Article 1.



that several provisions in this agreement can no longer be considered appropriate. This could also be the case for INFCIRC/66-type agreements applying in other non-NPT states.

## Inconsistency with the IAEA Statute

As currently drafted the India-IAEA safeguards agreement appears to be inconsistent with the IAEA Statute. The Statute requires the Agency to ensure that:

“... assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose.”<sup>8</sup>

The Agency is authorized to:

“... establish and administer safeguards designed to ensure that special fissionable and other materials ... under its supervision ... are not used in such a way as to further any military purpose.”<sup>9</sup>

It may be open to legal argument whether nuclear material under safeguards is under the Agency’s “supervision,” but clearly the situation is problematic where a safeguards agreement authorizes actions that could further a military purpose. Whatever the legal position, the agreement gives a cloak of legitimacy to the use of safeguarded facilities and material to benefit India’s unsafeguarded, “strategic,” nuclear program. This is clearly unacceptable. The agreement should be amended to remove the problematic provisions, regardless of India’s NSG application.

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8 IAEA Statute, Article II, <https://www.iaea.org/about/statute>.

9 IAEA Statute, Article III.A.5.

## Implications for Other States

In its safeguards agreement with the IAEA and its NSG membership bid, India should also consider the precedents being established. It is important not to replicate the problems outlined here with other non-NPT states seeking to join the NSG, such as Pakistan. As with India, there will be a need for a general safeguards agreement that applies to an updateable list of facilities in the state. However, this agreement should not be based on the INFCIRC/66 model unless the problematic provisions discussed here are omitted. If India is reluctant to amend its safeguards agreement, perhaps Pakistan can lead by example by concluding an agreement that avoids these problems.

## Conclusions

While the 2009 India-IAEA agreement has extended the application of IAEA safeguards in India, a number of power reactors and related facilities remain outside safeguards, and the language of India's Separation Plan makes it clear that unsafeguarded facilities are "engaged in activities of strategic significance." India has undertaken to place future imported reactors under safeguards, but it is bound to do this anyway at the supplier's behest. India gives no commitment about placing any further indigenous facilities under safeguards, other than a vague reference to include those facilities India deems "civilian."

India's continued operation of dual-purpose facilities is strategically provocative—for instance Pakistan views India's fast breeder reactors, and other unsafeguarded materials and facilities, as part of the military program, posing a strategic threat.<sup>10</sup> India, far from assuming the same responsibilities as other leading nuclear countries, is operating a fuel cycle model—civilian and military programs closely linked—that was abandoned by the nuclear-weapon states decades ago.

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<sup>10</sup> See Mansoor Ahmed, "India's Nuclear Exceptionalism," Discussion Paper (Cambridge, MA: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, May 2017). <https://www.belfercenter.org/publication/indias-nuclear-exceptionalism>.

India should revise its Separation Plan. A genuine separation of civilian and military programs requires elimination of the ambiguous category of dual-use facilities. All civilian facilities (including all reactors that generate power for civilian use) should be placed under permanent IAEA safeguards, and all facilities outside safeguards should be clearly seen as military and kept functionally separate from the civilian program. It would also be a major confidence-building step if India placed under safeguards all unsafeguarded power reactor spent fuel, and all plutonium separated from power reactor fuel.

The India-IAEA safeguards agreement is a major part of the problem, allowing India the flexibility to move safeguarded material between its safeguarded and unsafeguarded nuclear programs. As a positive commitment to the integrity of IAEA safeguards, as well as to meet NSG requirements, India should initiate amendments to remove the problematic provisions from its safeguards agreement. If India is not intending to use these provisions to move nuclear material between its safeguarded and unsafeguarded programs it should embrace the opportunity to make the necessary amendments. As an immediate step India could make a public commitment not to take advantage of these problematic provisions.

A further consideration in clearly separating civilian and military programs is the substantial effort required by the IAEA to implement safeguards in India. Reducing potential diversion pathways could enable some rationalization of this effort.

If India does not take the initiative in amending the safeguards agreement, the IAEA needs to review whether in its current form the agreement is consistent with the Agency's obligations under its Statute. If there is any doubt in this regard, the Agency should initiate appropriate amendments.

## About The Project On Managing the Atom

The Project on Managing the Atom (MTA) is the Harvard Kennedy School's principal research group on nuclear policy issues. Established in 1996, the purpose of the MTA project is to provide leadership in advancing policy-relevant ideas and analysis for reducing the risks of nuclear and radiological terrorism; stopping nuclear proliferation and reducing nuclear arsenals; lowering the barriers to safe, secure, and peaceful nuclear energy use; and addressing the connections among these problems. Through its fellows program, the MTA project also helps to prepare the next generation of leaders for work on nuclear policy problems. The MTA project provides its research, analysis, and commentary to policy makers, scholars, journalists, and the public.

E-mail: [atom@hks.harvard.edu](mailto:atom@hks.harvard.edu)

Website: <http://belfercenter.org/mta>



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Belfer Center for Science and International Affairs  
Harvard Kennedy School  
79 John F. Kennedy Street  
Cambridge, MA 02138

[www.belfercenter.org](http://www.belfercenter.org)