

Revision 2 February 2015 of submission dated 27 January 2015

Australia-India Nuclear Cooperation Agreement

Treaty tabled on 28 October 2014

Supplement to Submission No.1 for JSCOT Review - John Carlson

This Supplement updates and elaborates on key points in my Submission of 2 November 2014. This revision updates information on the Russia-India fuel arrangements (pages 4 and 5).

1. Context

Nuclear cooperation with India presents particular challenges:

- India remains outside the NPT and has not accepted any equivalent treaty obligations
- India's non-proliferation record is far from "impeccable", e.g. it violated peaceful use agreements by using a Canadian-supplied reactor to produce weapons material
- India is expanding its nuclear weapons program – directed at China as well as Pakistan
- India has only partially separated its civilian and military nuclear programs, and only part of the civilian program is safeguarded
 - 8 of 22 current power reactors, as well as fast breeder reactors, enrichment and reprocessing facilities are outside safeguards, therefore available for the nuclear weapon program
- the India-IAEA safeguards agreement is unique and complex, with several loopholes, e.g. allowing use of safeguarded nuclear material in the unsafeguarded program, resulting in unsafeguarded plutonium – see 3 below and the Appendix hereto
- the IAEA agreement is conditional on continuity of foreign fuel supplies: in the event of any supply disruption (e.g. following a further Indian nuclear test) it is unclear how these provisions would affect foreign-supplied nuclear material in India at that time
- the negotiations of Australia's safeguards partners, particularly the US, Japan and the EU, will be impacted by what Australia does with India in terms of safeguards.

A key objective of the US decision to remove the barriers to nuclear cooperation with India was to encourage India to meet international nuclear norms. This objective is not helped by compromising those norms. In all the circumstances, anything less than the full application of Australia's established safeguards conditions should be unthinkable.

In their Joint Statement of 25 January 2015 President Obama and Prime Minister Modi "welcomed the understandings reached on the issues of civil nuclear liability and administrative arrangements for civil nuclear cooperation". It is understood the specifics of these understandings are still under discussion, and it may be some time before the details are available.

2. The proposed agreement does not meet Australia's safeguards requirements

The proposed agreement represents a serious weakening of Australia's established safeguards conditions. Weaknesses in this agreement, combined with loopholes in the IAEA agreement, mean Australian material could be used in support of India's nuclear weapon program. The extent of this risk depends on whether the agreement is revised, and especially on how the issue of accounting and tracking is resolved.

2.

Australia's main safeguards requirements and how the agreement fails to meet these are set out as follows:

(a) ***Australian obligated nuclear material (AONM) should be identified and accounted for*** [*see Submission item 5.(a)*] This is the most important single issue. The agreement cannot be implemented without appropriate accounting and tracking arrangements, because it will not be possible to identify the specific material to which the agreement applies. For this reason accounting and tracking are a legal necessity, not an option that can be negotiated away. Accounting and tracking arrangements are also a legal requirement under the Safeguards Act [s.51(2)], which requires ASNO to produce an annual report on the quantities of AONM under each agreement and at each stage of the fuel cycle.

The agreement requires each Party to establish an accounting system for material subject to the agreement [Article III.5]. Details are to be in the Administrative Arrangement (AA) under the agreement, yet to be concluded. Indian officials have refused to provide accounting and tracking information to the US – the 2007 US-India agreement is still not operational, because officials have been unable to conclude the AA for that agreement. Now it seems the US and India have found a practical solution to the accounting/tracking issue. Contrary to media reports, the US has not dropped its requirement for accounting and tracking, which are mandated by US law. Rather, what is under discussion is how these requirements will be met.

India's attitude on accounting and tracking may be due in part to India having only a simplified form of safeguards accounting, based on its previous IAEA agreement. Currently the IAEA is working with India to introduce a modern accounting system, to ensure that the IAEA can identify material required by bilateral agreements to be safeguarded. Regardless of how the issues with the Australia-India agreement are resolved, Australia should not send AONM to India until we are sure India's accounting system is meeting IAEA requirements, including accounting for and tracking material under bilateral agreements (this is an example why the right to IAEA reports – (e) below – is so important) – otherwise we could be violating our NPT obligation to ensure nuclear material does not end up in nuclear weapons.

Media reports suggest the Australian Government has instructed officials to conclude the AA quickly, without insisting on accounting and tracking. This would be an abandonment of Australia's principles and would break ranks with our safeguards partners – the US, Japan and the EU. It would also create a problem for Australian producers – Australian uranium contracted to India could not be enriched and fabricated¹ in the US or Europe, as those countries will not retransfer to India until they have concluded acceptable accounting/tracking arrangements. It is essential for the Government to avoid action now that could undercut US efforts to conclude its AA with India.

(b) ***AONM should be limited to safeguarded facilities*** [*see Submission item 5.(c)*] The proposed agreement fails to meet this requirement. It says only that AONM must be subject to the India-IAEA agreement [Article VII.4]. The IAEA agreement allows India to use safeguarded material in unsafeguarded facilities – the implications are discussed in 3 and the Appendix.

By contrast to the proposed agreement, all Australia's agreements with nuclear-weapon states limit use of AONM to facilities that are included in the state's *eligible facility list* for IAEA safeguards. Our agreements with China and Russia go further – AONM is limited to facilities in a mutually determined fuel cycle program, i.e. specific facilities are subject to Australia's approval.

1. Made into fuel assemblies.

3.

(c) ***The IAEA Additional Protocol (AP) should apply*** [see Submission page 9, item 2.(e)] In the 2005 Bush/Singh statement India undertook to conclude an AP “with respect to civilian nuclear facilities”. The 2007 India-US nuclear cooperation agreement stipulates that nuclear material under the agreement will be subject to an AP. India has not met this commitment – India’s AP is limited to certain nuclear exports, and has no application to any nuclear material or facilities in India. The National Interest Analysis is wrong when it says AONM will be subject to the AP (NIA paragraph 11) and that the Australia-India agreement assures that all civilian facilities in India and all AONM will be subject to the AP (NIA paragraph 15).

India has an AP in name, but clearly it does not meet the intent of Australia’s policy. This is likely to be a very difficult issue to resolve, and it could be considered a lower priority relative to the many other problems with the agreement, so it is not included in the list of actions called for below. However, India’s approach on its AP calls into question its attitude towards bilateral commitments.

(d) ***Australian consent to reprocessing should be given only on a programmatic basis*** [see Submission item 5.(b)] Programmatic consent means reprocessing² and use of plutonium can take place only under a fuel cycle program agreed by both sides – Australian approval is required for the specific facilities using, handling or storing plutonium, and the purposes involved. To date Australia’s consent to reprocess has been given only to Japan and the EU (reprocessing facilities in UK and France), under mutually agreed programs.

The proposed agreement gives reprocessing consent without Australia having any say about facilities and uses of plutonium. Effectively the agreement outsources our consent to the US – India can reprocess Australian material and use the recovered plutonium provided this is in accordance with the India-US reprocessing arrangements. As the administrative arrangements for the India-US reprocessing arrangements have not yet been agreed, at this stage we simply do not know what the US will agree with India. It is irresponsible to give reprocessing consent on such an open-ended basis.

(e) ***Australia should have the right to IAEA reports on safeguards relating to AONM*** [Submission item 5.(d)] This is a standard provision in all of Australia’s other agreements. The agreement with India has no such provision. In the absence of such a provision, IAEA reports are confidential to India (Article 8 of the India-IAEA agreement). Australia has no right to IAEA reports relating to AONM in India, nor even whether India is meeting IAEA accounting requirements (see point (a) above).

(f) ***There should be fallback safeguards that are equivalent to IAEA safeguards*** [Submission item 5.(e)] Australia’s standard condition is that, if for any reason IAEA safeguards cease to apply, the parties are to establish safeguards arrangements that conform with IAEA safeguards principles and procedures and provide equivalent assurance. The proposed agreement requires only that the parties consult and agree on “appropriate verification measures”, a vague term open to differing interpretations.

(g) ***Australia should have the right to return of supplied material and items in the event of a breach*** [Submission 5.(f)] The proposed agreement has no such provision.

(h) ***Disputes should be settled by negotiation, with an arbitration process in case negotiations fail*** [Submission 5 (g)] The proposed agreement provides only for negotiation. This leaves Australia in a weak position, especially as the shortcomings in the agreement,

2. Reprocessing involves dissolution of spent fuel to separate the plutonium produced during irradiation in a reactor.

together with the problem areas in the India-IAEA agreement, create ample possibilities for dispute.

3. Problems under the India-IAEA safeguards agreement

The IAEA agreement contains a number of unique provisions, allowing India considerable flexibility in the way it uses safeguarded material:

- safeguarded plutonium can be substituted by unsafeguarded plutonium of lower isotopic quality
- safeguarded material can be used in facilities in the unsafeguarded program
- safeguarded material can be used with unsafeguarded material
- plutonium produced using safeguarded material in an unsafeguarded reactor can be exempted from safeguards if the proportion of safeguarded material is less than 30% of the total.

As discussed in the Appendix hereto, India could use these provisions to obtain unsafeguarded plutonium through substitution or exemption.

It is notable that similar provisions are not available to the nuclear-weapon states under their safeguards agreements with the IAEA – if a facility is eligible for IAEA safeguards (i.e. included in the *eligible facility list* under the agreement concerned), all nuclear material in the facility is subject to safeguards. Safeguarded material cannot be used outside eligible facilities.

4. How to address these problems

(a) ***Accounting and tracking*** There can be no compromise on this – without appropriate accounting and tracking of material under the agreement, the agreement will be unimplementable. If India can account for and track bilaterally-obligated material for the IAEA, it can also do this for Australia – this is a matter of willingness to cooperate, or lack thereof. If Indian officials are unwilling to cooperate, then it must be asked, how can the Government be confident that the agreement will work satisfactorily?

If Indian officials still refuse to provide the standard accounting and tracking information, and if despite this the Government persists with this agreement, there is a “practical” approach that *might*, depending on the details, meet the objectives of accounting and tracking – this is an approach along the lines of fuel leasing. For example, currently Russia supplies fuel assemblies to India for Russian-supplied reactors. Australian uranium could be enriched and fabricated in Russia and supplied to India under these arrangements. If other suppliers established similar arrangements (supply of fuel assemblies for a self-contained fuel program within India), Australia may be able to piggy-back on such arrangements.

Such an approach, however, has a number of shortcomings – it would suffice only for the specific circumstances outlined here (supply as fuel assemblies for specific reactors), and would not enable AONM to be supplied to India in any other way, e.g. uranium could not be supplied directly to India for processing in India. The approach depends on a supplier establishing arrangements with India that met both its and Australia’s accounting/tracking requirements, so Australia’s choice of countries through which to supply could be limited. Most importantly, there is the problem of how to track plutonium if the fuel assemblies are reprocessed – the fuel assemblies will lose their identity and Australia will have no knowledge of how or where the recovered plutonium is used. Since in this agreement Australia already gives reprocessing consent, we will not have the opportunity to negotiate

appropriate arrangements for reprocessing closer to the time (the reprocessing problem would be avoided, however, if Australia supplied through Russia and Russia took back the spent fuel – this is understood to be an option in the Russia-India contracts).

The Government should be prepared to give JSCOT and the public a firm commitment that the AA will not be concluded until India agrees to arrangements that meet Australia's standard accounting and tracking requirements or ensure an equivalent outcome. Whatever is agreed between the US and India on accounting and tracking could be very important here. Unless Indian officials accept our standard procedures, ASNO should not conclude the AA until the details of the US-India arrangements are known and ASNO is able to assess whether they can be helpful in meeting Australia's requirements – and if so, how this should be reflected in the AA.

In view of the fundamental importance of this issue to the effective operation of the agreement, it is essential for JSCOT to be able to examine the text of the AA before it is concluded, if necessary *in camera*, and to be briefed on how the AA will meet Australia's safeguards requirements. Given the degree of public interest in this agreement, the Government should make this AA public.

(b) **Substitution** The agreement should be revised so that substitution between safeguarded and unsafeguarded materials is permissible only between materials of the same isotopic quality.

(c) **Limiting AONM to safeguarded facilities** At the very least the agreement should be revised so that AONM can be used only in safeguarded facilities listed in the Annex of the India-IAEA agreement. Preferably, the agreement should provide for a *mutually determined fuel cycle program*, as in Australia's agreements with China and Russia. This would avoid the problem of safeguarded material being used in the unsafeguarded program.

(d) **Programmatic consent to reprocessing** Revise the reprocessing consent, so plutonium can be used only within a *mutually determined fuel cycle program* (this can be combined with the fuel cycle program discussed in (c) above).

(e) **Right to IAEA reports** Revise the agreement to enable Australia to obtain IAEA reports relating to safeguards on AONM.

(f) **Fallback safeguards** Revise the agreement to require that fallback safeguards arrangements conform with IAEA safeguards principles and procedures and provide equivalent assurance.

(g) **Right of return** Revise the agreement to include Australia's standard provisions on this.

(h) **Dispute settlement** Revise the agreement to include Australia's standard provisions on arbitration.

The Government should take up with India the mutual interest in improving the text of the agreement to ensure it provides a better long term basis for nuclear cooperation between the two countries. It is to be hoped that Prime Minister Modi can bring a new perspective to this negotiation and will see the benefit of the two countries working together constructively to improve the present text.

Problem Areas in the India-IAEA Safeguards Agreement

The 2009 India-IAEA safeguards agreement contains a number of unique provisions. The agreement states that the purpose of safeguards is *to guard against withdrawal of safeguarded nuclear material from civilian use* (Article 3). However, the agreement gives India considerable flexibility to move safeguarded material in and out of the unsafeguarded nuclear program, and the combined effect of the agreement's provisions is to enable safeguarded material to be used to produce unsafeguarded plutonium.

The major problem areas are as follows:

1. Substitution

Article 30(d) allows India to substitute unsafeguarded nuclear material for safeguarded material. In the case of plutonium, the agreement allows substitution based simply on element mass (weight), without taking account of isotopic quality. Thus, 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 (it has large unsafeguarded stocks of this material).

Some examples where this could be done include:

- India could use safeguarded uranium fuel as *start-up fuel* in a safeguarded power reactor. This fuel is discharged after the initial operating period (typically 12 months). The plutonium produced in the fuel will be *low burnup*, close to weapon-grade. India could replace this with *high burnup* (reactor-grade) fuel as outlined above.
- India could use safeguarded uranium in the *blanket* of an unsafeguarded fast breeder reactor (FBR) (see below). The plutonium produced in FBR blankets is weapon-grade, and particularly attractive for nuclear weapons. This plutonium would be subject to safeguards initially, but here too India could replace it with reactor-grade plutonium.

Comment – Plutonium removed from safeguards through substitution will be available for unsafeguarded purposes, including nuclear weapons. Clearly the situations outlined here are totally unsatisfactory – plutonium substitution should be allowed only between batches of similar isotopic quality (consistent with the IAEA's policy on substitution of enriched uranium).

While substitution under Article 30(d) requires the IAEA's agreement, however, it is not clear on what basis the IAEA could decline a request. Nor is it clear, considering the explicit language of Article 30(d) for substitution on the basis of mass, whether the IAEA *could* make isotopic equivalence a condition of approval.

2. Use of safeguarded nuclear material in unsafeguarded facilities

The agreement allows India to use safeguarded material in unsafeguarded facilities – see e.g. 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, when combined with the exemption

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provisions this provides the opportunity for safeguarded material to contribute to the unsafeguarded program.

3. Use of safeguarded material with unsafeguarded material

The agreement allows India to use safeguarded and unsafeguarded materials together – see e.g. Articles 25, 95 and 96. As with 2, this provides the opportunity for safeguarded material to contribute to the unsafeguarded program.

4. Exemption from safeguards

Article 25 allows special fissionable material (e.g. 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% of total material.

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

What this could mean in practice can be illustrated by the following example:

- a. India loads an unsafeguarded fast breeder reactor with MOX (mixed oxides of plutonium and uranium) comprising safeguarded plutonium and unsafeguarded uranium (Article 96(c) allows for safeguarded and unsafeguarded materials to be blended);
- b. India uses unsafeguarded uranium for the reactor's radial and axial *blankets*, in which plutonium is produced;
- c. doing the calculations for India's Prototype Fast Breeder Reactor, in this example, when the reactor is loaded the proportion of safeguarded material (plutonium) to total material (plutonium and uranium) will be around 11% (i.e. well within the 30% threshold);
- d. when the reactor is unloaded at the end of its operating cycle, 11% of the plutonium produced in the blankets (corresponding to the initial proportion of safeguardable material) will be subject to safeguards;
- e. India can claim exemption from safeguards for the other 89% of the plutonium produced;
- f. India could remove the remaining 11% from safeguards through the substitution provisions, replacing it with plutonium of lower isotopic quality.

The Prototype Fast Breeder Reactor can produce around 140 kg of weapon-grade plutonium a year. As this example shows, all of this plutonium could be available for India's unsafeguarded program. There would be no information on how India uses this plutonium once it leaves safeguards, it must be assumed it could end up in nuclear weapons.

Comment – The outcome outlined here cannot be considered appropriate. Use of *proportionality* rules should be based on *fissile* rather than fissionable composition (i.e. plutonium-239 and plutonium-241 content rather than all plutonium and uranium). But the real problem is the ability to use safeguarded and unsafeguarded material together – this should not be permissible. It is important to ensure that bilateral agreements, such as the agreement now under review, provide mechanisms to block this loophole in the IAEA agreement. Limiting AONM to facilities approved by Australia would address this issue.