SUBMISSION TO THE JOINT STANDING COMMITTEE ON TREATIES REGARDING THE AGREEMENT BETWEEN THE GOVERNMENT OF AUSTRALIA AND THE GOVERNMENT OF UKRAINE ON COOPERATION IN THE PEACEFUL USES OF NUCLEAR ENERGY

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1. LIST OF RECOMMENDATIONS

1. DFAT/ASNO should be directed to explain their failure to discuss unresolved disputes regarding Ukraine's compliance or non-compliance with Espoo Convention obligations, Energy Community obligations, and obligations attached to European loan funding for reactor safety upgrades. DFAT/ASNO should be directed to belatedly report on those unresolved issues and that report should be subject to independent expert scrutiny and public scrutiny.

2. JSCOT's consideration of the Australia–Ukraine Agreement should be deferred to allow for an assessment of the trajectory of the Russia/Ukraine conflict, and resolution of the disputes regarding Ukraine's compliance with its Espoo Convention obligations and its Energy Community obligations.

3. The JSCOT should invite DFAT/ASNO to apologise for providing the Committee with false claims regarding "stringent" safeguards conditions or to justify the claim with specific reference to the extreme infrequency of safeguards inspections in Russia.

4. DFAT/ASNO should be asked to explain to the Committee how the Australia–India Agreement – and the government's rejections of all of the JSCOT's recommendations regarding the Agreement – is consistent with their claim that Australia's "stringent" safeguards conditions contribute "to raising overall standards" worldwide.

5. DFAT/ASNO should be asked to explain to the JSCOT how the Australia–India Agreement is consistent with a desire to promote universal adherence to the NPT.

6. The JSCOT should direct DFAT/ASNO to write a detailed analysis of security threats facing Ukraine and the potential implications for AONM. The JSCOT should then seek independent expert review of DFAT/ASNO's report. The JSCOT should also publicly release the DFAT/ASNO report and seek public submissions responding to the report.

7. The JSCOT should consider recommending that future DFAT/ASNO consultations should include not only industry and government but also other stakeholders – including Traditional Owners affected by existing and proposed uranium mines, and NGOs with a demonstrated interest in uranium mining and related issues including safeguards.

8. DFAT/ASNO should be asked to report on its previous statements regarding the potential economic benefits of other bilateral agreements and how those statements compare with actual experience since the Agreements were finalised.

9. The JSCOT should recommend against uranium sales to Ukraine unless and until full compliance with i) Espoo Convention obligations, ii) Energy Community obligations, and iii) obligations attached to European loan funding for reactor safety upgrades has been demonstrated.

10. The JSCOT should seek input from neighbouring and regional countries that have sent multiple questions for clarification and requests for participation in trans-boundary consultations regarding Ukraine's reactor lifespan extension program. Those countries include Romania, Slovakia, Hungary and Austria. Those countries (and possibly others) have a strong interest in the issue and would likely be glad to provide JSCOT with relevant information. Ukraine denies its obligation to conduct any such consultations but its position is greatly weakened by the 2013 finding of non-compliance with the Espoo Convention.

11. DFAT/ASNO should be asked to explain how the Treaty text reaffirming the importance of bilateral and multilateral cooperation on nuclear safety arrangements can be reconciled with Ukraine's behaviour regarding the Espoo Convention, Energy Community obligations, and obligations attached to EU loan funding.

12. DFAT/ASNO should be asked to comment on reports (e.g. Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns') that the nuclear accident rate is increasing in Ukraine.

13. DFAT/ASNO should be asked to comment on reports (e.g. Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns') that Ukraine does not have a chief inspector for nuclear and radiation safety.

14. DFAT/ASNO should be directed to report on their understanding of the nature and adequacy/inadequacy of nuclear regulation in Ukraine.

15. DFAT/ASNO should be asked if there are any concrete plans for collaboration in the field of nuclear regulation, and if so, what is the nature of that envisaged collaboration and what funding, if any, has been sought or allocated.

16. DFAT/ASNO should be asked to advise as to the accuracy of a March 2015 report stating that as of January 2015 the State Nuclear Regulatory Inspectorate of Ukraine is prevented from conducting any safety inspections on its own initiative, and if so, whether that breaches obligations attached to EBRD funding.

17. DFAT/ASNO should be asked to advise as to the accuracy and currency of the concerns raised by Bankwatch/NECU in its March 2015 report, 'Independent review of the proposed lifetime extension of Unit 1 at the South Ukraine nuclear power plant and its compliance with relevant nuclear safety standards'.

18. DFAT/ASNO should be asked to advise as to whether nuclear waste management in Ukraine is consistent with Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, with particular reference to spent fuel stored at the Zaporizhye nuclear plant and reports that spent fuel is inadequately protected there (e.g. *The Guardian*, 13 May 2015, 'Nuclear waste stored in 'shocking' way 120 miles from Ukrainian front line').

19. DFAT/ASNO should be asked to advise as to the accuracy of claims that the Ukrainian government has lowered the amount of money operators must put aside for managing nuclear waste and the implications of any such lowering.

20. DFAT/ASNO should be asked to respond to the following questions:
– Can DFAT/ASNO provide detailed information on IAEA safeguards inspections in Ukraine over the past three years (the number of inspections, sites inspected, findings etc.?
– Does the IAEA hold information on safeguards inspections in Ukraine which is not available to the Australian government?
– Have inspections been carried out in contested or conflict-ridden regions of Ukraine (Crimea, eastern Ukraine) over the past three years and can DFAT/ASNO provide details?
– Have IAEA inspections in contested or conflict-ridden regions of Ukraine (Crimea, eastern Ukraine) been in any way compromised or delayed?
– Are IAEA inspections in Crimea conducted under the IAEA/Ukraine Agreement or the IAEA/Russia Agreement?

21. The JSCOT should recommend negotiations such that IAEA safeguards reports regarding Ukraine are sent to Australia as a matter of course, not just on Australia's request, and that the reports are publicly released.

22. ASNO should be required to provide the JSCOT with credible plans regarding the implementation of fallback safeguards.

23. DFAT/ASNO should be asked to detail the circumstances under which security threats (as opposed to proliferation concerns) would lead to the return of AONM to Australia, the process that would need to be followed, the amount of time that would be required to negotiate and carry out the return of AONM (and the consistency of that timeframe with the potential need to remove AONM from Ukraine as a matter of urgency), legal and regulatory issues in Australia, where the AONM might be stored in Australia, etc.

24. The JSCOT should recommend negotiations with Ukraine, and amendments to the Agreement, such that AONM can be quickly removed and transported to Australia in the event of unacceptable security threats.

25. DFAT and ASNO should be asked to advise as to whether they envisage programmatic consent, or case-by-case consent for reprocessing by Ukraine (presumably in another country since Ukraine does not have a large reprocessing plant – it only has hot cell facilities servicing research reactors).

26. The JSCOT should recommend renegotiation of the Treaty text such that the possibility of reprocessing of AONM (in Ukraine or elsewhere) is precluded or, failing that, renegotiation such that reprocessing in Ukraine is precluded.

27. The JSCOT should recommend amendments to the Agreement requiring public disclosure of:
i) Any separation and stockpiling of Australian-obligated plutonium.
ii) The Administrative Arrangements (which contain vital information about the safeguards arrangements required by Australia – including Ukraine's system of accounting for and control of AONM).
iii) All IAEA safeguards reports concerning Ukraine.
iv) Information on nuclear accounting discrepancies (Material Unaccounted For – MUF) including the volumes of nuclear materials, and the reasons given to explain accounting discrepancies. The JSCOT has previously recommended that: "Further consideration is given to the justification for secrecy of 'Material Unaccounted For'."[1] There is no legitimate justification for the secrecy surrounding MUF. ASNO has done no better than to cite commercial confidentiality.[2] Some other countries (e.g. Japan) release MUF data and thus Australia's secrecy clearly fails to meet best practice.
v) The quantities of different types of AONM held in Ukraine (and on-sent to third countries). This information is currently confidential but there is no legitimate reason for that secrecy. ASNO states: "The actual quantities of AONM held in each country, and accounted for by that country pursuant to the relevant agreement with Australia, are considered by ASNO's counterparts to be confidential information."[3]
vi) Further to the previous point, the DFAT/ASNO National Interest Analysis states that Ukraine is required to provide an annual report on all transactions and inventories involving AONM. That report should be publicly released. If there are legitimate concerns (e.g. security concerns regarding the public release of information on fissile material holdings at particular facilities), then the report should be released with redactions.

28. The JSCOT should recommend an amendment to the Agreement such that prior Australia consent is required for any transfer of AONM to a third country, with no exception for countries that have a bilateral agreement with Australia in place.

2. INTRODUCTION AND SUMMARY

2.1 Introductory comments

FoE of the Earth Australia (FoE) appreciates the opportunity to make a submission to this inquiry and we would appreciate the opportunity to appear at a public hearing of the Committee. FoE has contributed to all Joint Standing Committee on Treaties (JSCOT) inquiries regarding bilateral nuclear agreements over the past 10+ years and also the 2009 JSCOT inquiry into safeguards and non-proliferation.

FoE opposes the uranium mining industry and, unsurprisingly, we oppose the Australia–Ukraine Agreement. However our position is evidence-based, not ideological, and one set of circumstances that would trigger a major rethink of our position would be if the political leverage attached to uranium exports was consistently

[1] Joint Standing Committee on Treaties, 2008, 'Report 94: Review into Treaties tabled on 14 May 2008', List of Recommendations, www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/report1/fullreport.pdf

[2] www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/subs/sub22_1.pdf

[3] ASNO − Australian Safeguards and Non-proliferation Office, 2001-02, Annual Report, www.asno.dfat.gov.au/annual_report_0102/asno_annual_report_2001_2002.pdf

used to drive meaningful improvements in nuclear safety, security and non-proliferation standards. DFAT/ASNO claim that Australia does indeed raise worldwide standards through bilateral agreements but those claims does not stand up to scrutiny (e.g. uranium sales to Russia despite the near-complete absence of IAEA inspections; uranium sales to Japan with no attempt to pressure Japan's corrupt and dangerous 'nuclear village' to address serious, protracted problems; uranium sales to India with no attempt to leverage non-proliferation outcomes such as accession to the Comprehensive Test Ban Treaty).

JSCOT has an opportunity to make recommendations which, if implemented, would involve Australia leveraging uranium exports to achieve positive outcomes. A number of relevant issues are addressed in this submission. To mention just one here: uranium sales could be made conditional on full, demonstrated compliance with the Espoo Convention (the UN Convention on Environmental Impact Assessment in a Transboundary Context). The Espoo Convention's Implementation Committee is currently preparing a report, for the June 2017 Meeting of the Parties, on Ukraine's adherence to (or violation of) the Convention. Thus JSCOT's consideration of the Australia–Ukraine Agreement should be put on hold until the Espoo Convention's Implementation Committee has resolved the matter.

Likewise, uranium sales could (and should) be made conditional on full, demonstrated compliance with the Aarhus Convention (the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters) and safety-related obligations attached to EU loan funding for reactor safety upgrades. But the Department of Foreign Affairs and Trade (DFAT) and the Australian Safeguards and Non-proliferation Office (ASNO) do not envisage such conditionality; indeed they are silent on the safety issues just mentioned.

Recommendation: DFAT/ASNO should be directed to explain their failure to discuss unresolved disputes regarding Ukraine's compliance or non-compliance with Espoo Convention obligations, Energy Community obligations, and obligations attached to European loan funding for reactor safety upgrades. DFAT/ASNO should be directed to belatedly report on those unresolved issues and that report should be subject to independent expert scrutiny and public scrutiny.

Every time Australia's uranium export policy sinks to a new low (e.g. uranium sales to dictatorships, uranium sales to non-NPT states), a new precedent is set. In the case of the Australia–Ukraine Agreement, the precedent is uranium sales to a country dealing with an active and unresolved conflict situation. If that precedent is accepted, it will become more difficult to refuse uranium sales to other nation-states also dealing with active, unresolved conflict situations. The time to resolve that dilemma is now: the JSCOT should recommend against uranium sales to Ukraine because of the unresolved conflict situation with Russia and Russian-aligned insurgents, and because of the very serious nuclear security problems arising from that conflict (e.g. Ukraine's acknowledged loss of nuclear regulatory control in Crimea and parts of eastern Ukraine).

There is no urgency to approve the Australia–Ukraine Agreement. Ukraine is not in urgent need of alternative uranium sources. A delay would allow Australia to better assess the trajectory of the Ukraine/Russia conflict. A delay would allow for resolution of the dispute as to Ukraine's compliance or non-compliance with Espoo Convention requirements and a related dispute regarding Ukraine's compliance or non-compliance with its Energy Community obligations.

Recommendation: JSCOT's consideration of the Australia–Ukraine Agreement should be deferred to allow for an assessment of the trajectory of the Russia/Ukraine conflict, and resolution of the disputes regarding Ukraine's compliance with its Espoo Convention obligations and its Energy Community obligations.

Regarding the details and nuances of the current Australia–Ukraine agreement, we offer comments and recommendations in this submission and those comments draw on a strong interest in safeguards issues over a long period of time. However FoE does not claim to have the same level of detailed knowledge as the non-proliferation experts who made important and in some cases prolific contributions to the JSCOT inquiry into the Australia–India nuclear agreement (John Carlson and others). The Committee may wish to consider inviting contributions from those experts (and others) if they have not already contributed.

Of course, there is expertise within DFAT and ASNO, but the reputation of those organisations has been tarnished[4] over the past decade (if not longer) and they are essentially sales-people for the nuclear agreements put before JSCOT (discussed further below). Hence the need for JSCOT to seek broader expert input.

We note that former ASNO Director-General John Carlson said in December 2014: "We should be worried about the current circumstances of civil unrest in Ukraine but we certainly hope that that is a temporary situation, and if we did negotiate an agreement with Ukraine, by the time we to the point of actually supplying uranium clearly we would want the law and order situation to be completely resolved."[5]

Clearly the security situation in Ukraine is not completely resolved. It is simmering with a significant risk of escalation. To be exporting uranium to Ukraine in these circumstances is clearly irresponsible.

2.2 What is the purpose of JSCOT inquiries into nuclear cooperation agreements?

FoE believes that JSCOT faces something of an existential crisis insofar as it is required to consider bilateral nuclear cooperation agreements. On those occasions when JSCOT has made strong, considered recommendations to government – in particular with the Russia and India agreements – those recommendations have been rejected. With the Russia agreement, the government at least pondered the recommendations for approx. 24 months and attempted to implement some of them, e.g. Australia asked the IAEA if it would be possible to increase the frequency of safeguards inspections in Russia (many years can pass between inspections) but the IAEA refused. With the Australia–India agreement, JSCOT recommendations were quickly and summarily dismissed.

The JSCOT may wish to consider (e.g. during closed sessions of the Committee) what steps might be taken to rectify the situation. If nothing else the Committee might, for example, take the gentle step of noting (in its next report) that its laborious consideration of the Australia–India Agreement stood in contrast to the government's quick and superficial rejection of the Committee's recommendations.

Likewise, the JSCOT could note that past predictions from industry, government and DFAT/ASNO have not materialised and that there are important examples of adverse outcomes, e.g. the export of a small amount of uranium to Russia followed by a suspension of sales. Predicted profits (and jobs) have not materialised and the security of the small amount of Australian-Obligated Nuclear Material (AONM – exported uranium and its by-products) is uncertain, not least because the government rejected JSCOT's common-sense recommendation that uranium sales to Russia should not occur unless "actual physical inspection by the IAEA occurs" at any Russian sites that may handle Australian uranium and that "the supply of uranium to Russia should be contingent upon such inspections being carried out." As things stand, there is no requirement for safeguarding of the Australian uranium (and its by-products), it is unlikely that any

[4] EnergyScience Coalition, 2007, 'Who's Watching the Nuclear Watchdog - A Critique of the Australian Safeguards and Non-Proliferation Office', www.energyscience.org.au/BP19%20ASNO.pdf
[5] ABC RN Drive, 11 Dec. 2014, 'Should Australia export uranium to Ukraine?', http:/www.abc.net.au/radionational/programs/drive/should-australia-export-uranium-to-ukraine3f/5961466 http://mpegmedia.abc.net.au/rn/podcast/2014/12/rnd_20141211_1815.mp3

safeguards inspections of sites holding AONM have been carried out (because many years can pass between inspections), and there is no way to find out since the government and the IAEA refuse to provide information as to whether or not any inspections have been carried out.

The JCSOT could note that the adverse outcome with AONM in Russia would not have eventuated – or at least the situation would have been ameliorated – if the government had the good sense to adopt JSCOT recommendations.

For NGOs, the dilemma is even greater than that faced by JSCOT. Our extensive engagement with the Russia and India JSCOT inquiries turned out to be a waste of time because the government rejected JSCOT's recommendations. In other circumstances – the bilateral nuclear agreement with China being the most striking example – JSCOT itself was largely disinterested and failed to thoroughly consider potential problems with the agreement.[6]

FoE has decades-long involvement in safeguards debates. We do not see it as a partisan issue or as a nuclear vs. anti-nuclear. Everyone has an interest in strong safeguards. The JSCOT may wish to consider initiating (if possible) or recommending the initiation of a dedicated JSCOT inquiry into nuclear safeguards. There are many unresolved issues to consider and, for better or worse, the 2009 JSCOT inquiry into safeguards and non-proliferation largely ignored safeguards in the interests of producing a unanimous report.

The JSCOT may wish to ponder options such as recommending JSCOT involvement at an earlier stage of treaty negotiations. Of course that presents practical problems – reviewing agreements that are a work-in-progress. But something needs to change: as things stand, governments seem extremely reluctant to seek changes to nuclear agreements by the stage they have reached JSCOT, and that severely undermines the integrity of the JSCOT scrutiny process.

2.3 Complaint regarding misinformation from DFAT/ASNO

DFAT/ASNO have provided the JSCOT with clearly false information.

The DFAT/ASNO National Interest Analysis states "Australia's bilateral nuclear cooperation agreements, including the proposed Agreement with Ukraine, provide stringent nuclear safeguards and security conditions designed to ensure Australian uranium is used exclusively for peaceful purposes ..."

That is a tendentious statement as applied to most of Australia's bilateral agreements, and it is false and indefensible as applied to the Australia–Russia Agreement. DFAT/ASNO misled the JSCOT with false claims[7] that "strict" safeguards would ensure peaceful use of Australian uranium in Russia (a false claim that was rejected by the JSCOT) and, as mentioned, the government rejected the JSCOT's recommendation that uranium sales to Russia should not occur unless "actual physical inspection by the IAEA occurs" at any Russian sites that may handle Australian uranium and that "the supply of uranium to Russia should be contingent upon such inspections being carried out."

DFAT/ASNO misled the JSCOT during the inquiry into the Australia–Russia Agreement, and DFAT/ASNO are once again misleading the JSCOT with false claims that all of Australia's bilateral nuclear cooperation agreements involve "stringent" safeguards and that those safeguards "ensure Australian uranium is used exclusively for peaceful purposes".

[6] See section 4 in: EnergyScience Coalition, 2007, 'Who's Watching the Nuclear Watchdog - A Critique of the Australian Safeguards and Non-Proliferation Office', www.energyscience.org.au/BP19%20ASNO.pdf
[7] http://www.onlineopinion.com.au/view.asp?article=7929&page=0

FoE's understanding is that misleading the JSCOT is equivalent to misleading Parliament – i.e. it is a very serious offence. FoE does not make such allegations lightly. The matter should be seriously reviewed by the Committee.

The DFAT/ASNO National Interest Analysis states that Australia's "stringent" safeguards conditions contribute "to raising overall standards" worldwide. The JSCOT should direct DFAT/ASNO to explain exactly how the Australia–India Agreement 'raises standards' when the truth of the matter is that it clearly drives standards downwards (a point made explicitly and repeatedly by non-proliferation and disarmament experts such as John Carlson). Once again, DFAT/ASNO have clearly misled the JSCOT.

The Australia–Ukraine Agreement states that the two countries reaffirm "their support for the objectives and provisions of the Treaty [NPT] and their desire to promote universal adherence to the Treaty". How can that support be reconciled with uranium sales India?

The DFAT/ASNO National Interest Analysis is extremely superficial in its comments on security threats that could jeopardise AONM. One explanation is that DFAT/ASNO has chosen to provide a superficial (and arguably misleading) account of security threats. Another explanation (and the two explanations are not mutually exclusive) is that relevant sections of DFAT and/or ASNO are under-resourced. The JSCOT may wish to question DFAT and ASNO as to whether or not they consider themselves to adequately resourced to negotiate and evaluate proposed bilateral nuclear cooperation agreements.

The DFAT/ASNO National Interest Analysis states that Ukraine has a "highly capable civilian nuclear industry." There is no mention of unresolved disputes about Ukraine's compliance or non-compliance with Espoo Convention obligations, Energy Community obligations, or obligations attached to European loan funding for reactor safety upgrades. That silence is unacceptable.

Other statements by DFAT/ASNO are extraordinarily sloppy or inconsistent and suggest that the National Interest Analysis may have been written by a student intern, or that it may have been written several years ago. For example the National Interest Analysis says that a provision for repatriation of AONM is one of the "essential elements of Australia's policy for the control of nuclear materials." Really? So why no such provision in the Australia–India agreement (ASNO in its own words was "not concerned that a right of return provision is not part of the proposed agreement"[8])?

A number of recommendations follow from the above comments:
– The JSCOT should invite DFAT/ASNO to apologise for providing the Committee with false claims regarding "stringent" safeguards conditions or to justify the claim with specific reference to the extreme infrequency of safeguards inspections in Russia.
– DFAT/ASNO should be asked to explain to the Committee how the Australia–India Agreement – and the government's rejections of all of the JSCOT's recommendations regarding the Agreement – is consistent with their claim that Australia's "stringent" safeguards conditions contribute "to raising overall standards" worldwide.
– DFAT/ASNO should be asked to explain to the JSCOT how the Australia–India Agreement is consistent with a desire to promote universal adherence to the NPT.
– The JSCOT should direct DFAT/ASNO to write a detailed analysis of security threats facing Ukraine and the potential implications for AONM. The JSCOT should then seek independent expert review of DFAT/ASNO's report. The JSCOT should also publicly release the DFAT/ASNO report and seek public submissions responding to the report.

[8] Dr Floyd, JSCOT report #151, sec 6.68.

2.4 DFAT/ASNO consultation / non-consultation

The DFAT/ASNO National Interest Analysis states: "The Australian uranium industry was informed of the proposed agreement by correspondence in late 2015. The proposed Agreement was discussed in face to face meetings with industry stakeholders at various events throughout 2016. Industry stakeholders welcomed the signature of the proposed Agreement. A briefing was provided to the States and Territories through the Commonwealth- State/Territory Standing Committee on Treaties for its meeting on 4 May 2016. No comments with respect to this proposed Agreement were received from the States and Territories."

DFAT has a history of NGO consultations regarding disarmament / non-proliferation. Those consultations have been constructive and cordial.

Recommendation: The JSCOT should consider recommending that future DFAT/ASNO consultations should include not only industry and government but also other stakeholders – including Traditional Owners affected by existing and proposed uranium mines, and NGOs with a demonstrated interest in uranium mining and related issues including safeguards.

3. AUSTRALIA'S URANIUM EXPORT INDUSTRY AND THE STALLED NUCLEAR POWER 'RENAISSANCE'

The global uranium price slump is likely is likely to continue for the next decade or so. That is not just wishful thinking from Friends of the Earth – such views are increasingly being expressed by industry insiders. For example, Nick Carter from Ux Consulting said in April 2016 that the spot uranium price could stay in the low $30s/lb "for quite some time" because supply is expected to exceed demand by 25–30 million lb U3O8 each year from 2016 to 2019. Carter does not see a supply deficit in the market until "the late 2020s".[9]

Likewise, Jonathan Hinze from Ux Consulting told the *Wall Street Journal* in mid-2016 that the global uranium glut is deepening with annual supply of about 200 million pounds of uranium oxide exceeding demand of 170 million pounds.[10] Macquarie said in a July 2016 note that it "is increasingly difficult to see what drives uranium materially higher from here."[11] According to UBS analysts in July, a turnaround in the market could be years off due to the slow reactor restart process in Japan and the slow pace of global nuclear expansion.[12] In July 2016, UBS revised its average spot uranium prices for the years ahead, and all the revisions were downward.

And to cite one other example, former World Nuclear Association executive Steve Kidd has repeatedly warned that optimistic predictions of strong nuclear power growth driving increased uranium demand and thus price increases amount to wishful thinking. His latest article was published in *Nuclear Engineering International* on 13 October 2016.[13] Among other problems, already vast uranium inventories continue to grow at a considerable rate and, from the perspective of uranium producers or would-be producers, there is

[9] Bejamin Leveau, 29 April 2016, 'Uranium industry focuses on costs as supply glut continues', http://blogs.platts.com/2016/04/29/uranium-cost-supply-glut/
[10] Rhiannon Hoyle and Mayumi Negishi, 31 July 2016, 'Japan Nuclear-Power Jitters Weigh on Global Uranium Market', www.wsj.com/articles/japan-nuclear-power-jitters-weigh-on-global-uranium-market-1469990663
[11] Ibid.
[12] Donald Levit, 27 July 27, 2016, 'Uranium Prices Remain Below Cost of Production, Recovery is Years Away', www.economiccalendar.com/2016/07/27/uranium-prices-remain-below-cost-of-production-recovery-is-years-away/
[13] Steve Kidd, 13 Oct 2016, 'Nuclear power in the world – pessimism or optimism?', www.neimagazine.com/opinion/opinionnuclear-power-in-the-world-pessimism-or-optimism-5031270/

no quick fix: even if there is an evening-up of production vs. demand, there will be little price incentive for new mines for quite some years, perhaps many years. Industry claims to the contrary are based on wishful thinking – a point repeatedly made by Kidd.

When assessing future predictions, reflection on past performance is important. The uranium price spike which began in 2005 was over by 2007, the price had halved by the time of the March 2011 Fukushima disaster, and it has halved again since then.

Likewise, projections of nuclear power growth need to considered in context. All the growth predictions over the past decade have not materialised. Regarding nuclear power growth (or the lack thereof), Steve Kidd wrote in January 2016: "The future is likely to repeat the experience of 2015 when 10 new reactors came into operation worldwide but 8 shut down. So as things stand, the industry is essentially running to stand still."[14]

It is near-certain that uranium mining will come to an end in the Northern Territory once stockpiled ore is processed at Ranger in the next few years (if not earlier). A few companies are betting on the possibility of profitable production in WA at some stage in the coming decade, but they will need extraordinary patience and they risk throwing good money after bad.

The industry's determination to open up new markets (the latest being Ukraine) can be seen as a sign of desperation, particularly given the enthusiasm for selling uranium to countries outside the NPT, countries refusing to sign and/or ratify the Comprehensive Test Ban Treaty, dictatorial / repressive states, states actively expanding their nuclear weapons arsenals, and, in the case of Ukraine, a country facing an active, unresolved conflict situation.

4. FUTURE TRAJECTORY OF UKRAINE'S NUCLEAR POWER PROGRAM AND UKRAINE's URANIUM DEMAND AND SUPPLY

4.1 Ukraine's Nuclear Power Program

As of 1 September 2016, the World Nuclear Association lists zero reactors under construction in Ukraine, and two reactors 'on order or planned'.[15] Eleven reactors are listed as 'proposed' but there is no reality to those 'proposals' – a 2006 state energy strategy document, covering the sector until 2030, foresaw the construction of 11 new reactors but much has changed since then. Among other obstacles, financing 11 new reactors would likely be prohibitive. Not so many years ago, one might have envisaged Ukraine signing a BOO (Build-Own-Operate) agreement with Russia, and Russian loan financing might have made a new reactor program viable in Ukraine. No such agreement will be reached in the context of the current Ukraine/Russia conflict and there is little prospect of other potential suppliers providing the sort of loan/funding arrangements that Russia's Rosatom does. Ukraine has received €600 million in EU loans just for a safety upgrade program. There is no likelihood of Ukraine receiving the tens of billions of dollars/euros that would be required to build 11 reactors.

The two reactors listed as 'on order or planned' by the World Nuclear Association are presumably the two partially-built Khmelnitski reactors in western Ukraine. Russia was to have helped finish construction of those reactors, but there is no prospect of Russian involvement in the current circumstances. Ukraine and

[14] Steve Kidd, 8 Jan 2016, 'After COP-21 - where does nuclear stand?', www.neimagazine.com/opinion/opinionafter-cop-21---where-does-nuclear-stand-4770510/
[15] http://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx

South Korea recently signed a nuclear cooperation agreement and the chief executive of Korea Hydro and Nuclear Power (KHNP) said the countries will work towards completion of the two Khmelnitski reactors. Pro-nuclear commentator Dan Yurman is sceptical, writing in September 2016:[16]
"There are several reasons to be skeptical about the deal.
– Ability of Ukraine to pay for the reactors. The country can't or won't pay for Russian gas.
– Supply Chain in Ukraine and use of Odessa as port of entry for large components. The Russians are not going to sell components to the South Korean EPC.
– Ongoing Russian sponsored military hostilities in eastern provinces which have the objective of destabilizing the current Ukrainian government.
"As for what South Korea is thinking, here are a few ideas.
– Based on its success in the UAE, S. Korea feels that they are up to any challenge including dealing with all the dysfunctional forces in Ukraine.
– S. Korea has mis-read or does not take seriously Russia's intentions to recapture the Ukraine breadbasket before China finishes buying all of its output.
– Memorandums for cooperation among nations on nuclear energy are a dime a dozen and timeless in that they have infinite shelf life with no money changing hands. S. Korea also inked this week a similar agreement with Kenya.
– S. Korea's counterparts in Ukraine having inked a deal for a nuclear fuel plant with Westinghouse last April now feel confident to finish the two partially built reactors since the plant will provide reliable fuel services for it and their other 15 reactors."

Nuclear Engineering International reported in August 2014:[17]

"[Former Chernobyl NPP director Mikhail] Umanets calculated that within seven years, Ukraine will face a "collapse" in its nuclear energy sector, since it does not have the necessary funds to maintain or expand the plants' operations. If Energoatom fails to renew its permission for the operation of two units at the Zaporozhe plant, Ukraine will have problems with its electricity supply of as soon as 2017, he added.

""Of the 15 units operating today, which provide Ukraine with 55.7% of its total electricity, half are expected to be stopped. In four years, seven reactors will reach the end of their operating life. Their operation must be extended. According to our estimates, extending the life of one block costs $300m. This means we will need $2.1bn over the next four years." However, he does not think government funding will be forthcoming.

""If the power units' life span is not extended, by 2020 we will lose 50% of our electricity, and by 2030 Ukraine will have no nuclear power at all. It will simply cease to exist." He added: "We have seven and a half years to solve this problem. Today, in order to put one [new] energy unit into operation, it's necessary to find $3-5bn. Where are we going to get the money? Even if we extend the life of the units in operation, but do not begin planning to those coming off line, this will also result in the collapse of our electricity generation sector.""

Since that August 2016 report, extensions have been approved for two Zaporozhe reactors. Nonetheless, the trajectory is clear: Ukraine is increasingly reliant on ageing reactors. Extending the lifespans of existing reactors is an expensive business and the construction of new reactors would be vastly more expensive.

[16] http://neutronbytes.com/2016/09/03/nuclear-news-round-up-for-september-3-2016/
[17] Nuclear Engineering International, 24 Aug 2016, 'Ukraine looks to NPP life extension amid safety concerns', www.neimagazine.com/news/newsukraine-looks-to-npp-life-extension-amid-safety-concerns-4988062

4.2 Implications for Australian uranium supply

The DFAT/ASNO National Interest Analysis states that Ukraine is a "significant" and "important" potential market for Australian uranium producers.

DFAT/ASNO have made similar or identical claims regarding previous nuclear cooperation agreements, and on most or all occasions the DFAT/ASNO claims have not been realised.
Recommendation: DFAT/ASNO should be asked to report on its previous statements regarding the potential economic benefits of other bilateral agreements and how those statements compare with actual experience since the Agreements were finalised.

According to the World Nuclear Association, Ukraine's uranium demand in 2016 will be 2251 tonnes of uranium (2,653 t U3O8).[18] That demand will likely be reduced over time as already-ageing reactors are shut down and because building new reactors is likely to prove immensely problematic.

An August 2014 *Energy Post* article states: "Although the Russian nuclear technology used in Ukraine necessitates the need for cooperation with Russia, Ukraine seeks to increase its control over the sector. This task is made easier by the fact that Ukraine possesses its own uranium resources, constituting approximately 2% of world reserves. Although the 225,000 tonnes of uranium (tU) located in 12 deposits would cover the total demand of Ukraine for the next 100 years, the current annual production (1,000 tU) allows Ukraine to meet only 30% of its domestic needs. According to SkhidGZK, Ukraine's uranium mining and processing company, the goal is to achieve self-sufficiency and, in the longer term, export of uranium surpluses. But this will only be possible with increased funding for the domestic industry, the opening of the Ukrainian market for international investment, and cooperation with foreign companies."[19]

Aspects of the *Energy Post* report may be dated and some of it is speculative but all the same, the available evidence suggests that Ukraine will at most import very modest amounts of uranium from Australia, if any, because of: significant domestic resources in Ukraine (such that Ukraine might become a net exporter); the multiplicity of potential suppliers; and the likelihood of declining demand as ageing reactors are shut down.

The DFAT/ASNO National Interest Analysis states that Ukraine mines enough uranium to provide for around half its requirements (not 30% as stated in the *Energy Post* article). If so, import requirements amount to around half of total demand of 2251 tU (2,653 t U3O8).

The DFAT/ASNO National Interest Analysis further states: "Ukraine has stated it is looking to conclude commercial agreements for supply from 2017 for around 300-600 tonnes of uranium ore concentrate per year (valued at approximately AUD23–46 million at August 2016 spot prices), which could include Australian uranium."

There might (or might not) be annual demand for some hundreds of tonnes of U3O8 from Australia, or demand of roughly 1300 tonnes from all suppliers.

The DFAT/ASNO estimate of annual revenue of A$23–46 million is reasonable. That would increase Australia's export revenue from all sources (over $300 billion p.a.) by 0.01%. While DFAT/ASNO's estimate of A$23–46 million annual sales is reasonable, DFAT/ASNO are pulling JSCOT's leg with the claim that Ukraine is potentially a "significant" and "important" potential market for uranium.

[18] www.world-nuclear.org/information-library/country-profiles/countries-t-z/ukraine.aspx
[19] Zuzanna Nowak, 27 Aug 2014, 'Why Ukraine’s dependence on Russia in nuclear is worse than in gas – and what to do about it', www.energypost.eu/ukrainian-nuclear-power-emerges-russian-shadow/

With the Australia–India Agreement, it was repeatedly argued that the goodwill attending uranium exports would open up markets for goods and services other than uranium. That argument fell flat – exports of all goods and services to India have fallen sharply. In any case no such argument could be made in relation to Ukraine. Merchandise exports from Australia to Ukraine in 2013 were valued at $35 million.[20] Exports could increase several-fold and still be negligible in the context of Australia's total export revenue of over $300 billion p.a.

5. UKRAINE's NUCLEAR POWER PROGRAM – SAFETY CONCERNS

5.1 Summary of major concerns

JSCOT needs to seriously address available information (and conflicting claims) regarding nuclear safety standards in Ukraine and the country's failure to implement safety-related requirements under international conventions and safety-related obligations attached to loan funding.[21]

One possible approach would be for JSCOT to recommend that uranium sales be permitted if and only if Ukraine fully complies with those safety-related obligations. Put another way, JSCOT could recommend that uranium sales not go ahead unless and until Ukraine is fully compliant with its obligations.

Recommendation: The JSCOT should recommend against uranium sales to Ukraine unless and until full compliance with i) Espoo Convention obligations, ii) Energy Community obligations, and iii) obligations attached to European loan funding for reactor safety upgrades has been demonstrated.

It is important to note that Ukraine has already (in 2013) been found to be non-compliant with the Espoo Convention (the UN Convention on Environmental Impact Assessment in a Transboundary Context). If JSCOT recommends unconditional approval of the Australia–Ukraine Agreement, JSCOT will effectively be saying that Espoo Convention compliance is an optional extra for Australia's uranium customer countries.

Further, the Espoo Convention's Implementation Committee is currently preparing a report, for the June 2017 Meeting of the Parties, on Ukraine's adherence to (or violation of) the Convention.[22] It would be irresponsible for JSCOT to endorse or the government to approve the Australia–Ukraine Agreement until those deliberations have been completed and it would be irresponsible for the government to unconditionally approve the Agreement if the Espoo Convention's Implementation Committee makes a second finding of non-compliance.

The European Court of Justice is considering a complaint lodged by an NGO regarding Ukraine's alleged non-compliance with safety obligations.[23] That complaint is discussed further below. It would be imprudent for the JSCOT to recommend unconditional approval of the Australia–Ukraine Agreement until the ECJ has considered that complaint. At the very least, the JSCOT should thoroughly consider the complaint and seek further information, not only from DFAT/ASNO but also from other sources.

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[20] Jane Norman, 11 Dec 2014, 'Australia in talks to help Ukraine avoid energy crisis by exporting uranium and coal to the war-torn region', www.abc.net.au/news/2014-12-11/australia-could-export-uranium-and-coal-to-ukraine/5959934
[21] Bankwatch, 3 Oct. 2016, 'New life for old nukes in Ukraine means more risk for people and planet', http://bankwatch.org/news-media/for-journalists/press-releases/new-life-old-nukes-ukraine-means-more-risk-people-and-plan
[22] Dana Marekova, 5 Sept. 2016, 'Ukraine's nuclear energy fixation puts its European financiers to a test', http://bankwatch.org/news-media/blog/ukraines-nuclear-energy-fixation-puts-its-european-financiers-test
[23] Ibid.

Ukraine is also under scrutiny by the Energy Community (established by an international treaty in 2005) for its failure to implement the EU's Environmental Impact Assessment Directive, one of the obligations tied to the safety upgrade funding. This is further discussed below. In a 6 September 2016 statement, the Energy Community gave Ukraine two months to "react to the allegation of non-compliance with Energy Community law".[24] JSCOT should track the progress of that dispute. It would be irresponsible to endorse the Australia–Ukraine Agreement until the dispute is resolved (possibly as early as November) and it would be irresponsible to unconditionally endorse the Agreement if a finding of non-compliance is made.

In August 2016, *Nuclear Engineering International* quoted former Chernobyl nuclear power plant director Mikhail Umanets saying that since 16 October 2014, Ukraine has not had a chief inspector for nuclear and radiation safety, that the position was eliminated, and that "no self-respecting professional would agree to take it after the cabinet proposed a bill to Ukraine's parliament which stated that 'the inspector's decisions may be cancelled by the head of the state regulator or his designated representative'."[25] Those claims are of course of serious concern – their accuracy and currency should be investigated by JSCOT.

Recommendation: The JSCOT should seek input from neighbouring and regional countries that have sent multiple questions for clarification and requests for participation in trans-boundary consultations regarding Ukraine's reactor lifespan extension program. Those countries include Romania, Slovakia, Hungary and Austria. Those countries (and possibly others) have a strong interest in the issue and would likely be glad to provide JSCOT with relevant information. Ukraine denies its obligation to conduct any such consultations but its position is greatly weakened by the 2013 finding of non-compliance with the Espoo Convention.[26]

The text of the Australia–Ukraine Agreement states that the two countries reaffirm "the importance of bilateral and multilateral cooperation for effective nuclear safety arrangements, and for enhancing such arrangements".

Recommendation: DFAT/ASNO should be asked to explain how the Treaty text reaffirming the importance of bilateral and multilateral cooperation on nuclear safety arrangements can be reconciled with Ukraine's behaviour regarding the Espoo Convention, Energy Community obligations, and obligations attached to EU loan funding.

The JSCOT should thoroughly consider available literature regarding declining safety standards in Ukraine – such as the *Nuclear Engineering International* report[27] summarised below. It should not be assumed that information from DFAT/ASNO is accurate or adequately detailed.

Background information regarding the above statements is provided below.

5.2 Background information on the reactor lifespan extension program and related controversies

Ukraine's nuclear regulator, the State Nuclear Regulatory Inspectorate Council, has recently approved further reactor lifespan extensions despite the country's failure to implement safety-related requirements

[24] Energy Community, 6 Sept. 2016, 'Secretariat initiates dispute settlement case against Ukraine for non-compliance with the Environmental Impact Assessment Directive', www.energy-community.org/portal/page/portal/ENC_HOME/NEWS/News_Details?p_new_id=13263
[25] Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns', www.neimagazine.com/news/newsukraine-looks-to-npp-life-extension-amid-safety-concerns-4988062
[26] Iryna Holovko, 18 May 2016, 'Time for Europe to stop supporting Ukraine's risky nuclear power sector', http://bankwatch.org/news-media/blog/time-europe-stop-supporting-ukraines-risky-nuclear-power-sector
[27] Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns', www.neimagazine.com/news/newsukraine-looks-to-npp-life-extension-amid-safety-concerns-4988062

under international conventions and safety-related obligations attached to loan funding.[28] The 30-year-old Zaporizhye-1 reactor was taken offline when it reached its design lifespan in December 2015, but restarted following approval of an extension in September 2016. Then in October 2016, the Zaporizhye-2 reactor, shut down when it reached its 30-year lifespan in February 2016, received approval for a 10-year extension.

This is the latest chapter in a long-running saga. Iryna Holovko from Bankwatch / National Ecological Centre of Ukraine writes:[2]

"Here's how this atomic debacle unfolded so far. In December 2010 the Ukrainian authorities approved the first lifetime extension. Unit 1 in the Rivne power plant, working since three decades, was allowed to continue operations for 20 more years. Barely a month later an accident happened, and the reactor's output had to be reduced by half.

"Unit 2 in the Rivne power plant was also granted a 20 years lifetime extension. Activists and civil society organisations criticised the decision-making process allowing these nuclear reactors' expiry dates to be rewritten. In March 2013, the Espoo Convention's Implementation Committee ruled the decision indeed was in breach of the treaty, since Ukraine did not carry out assessments of the impacts the project can have on people and the environment in neighbouring countries.

"But this did not deter the Ukrainian government. In December 2013 it approved another lifetime extension, this time for unit 1 in the South Ukraine power station. Energoatom, Ukraine's national energy operator, conducted technical checks of the nuclear reactor prior to the decision, but these might not have been thorough enough. An independent expert assessment[29] released in March 2015 criticised the re-licensing process that led to the approval of the lifetime extension, and warned that the reactor is suffering critical vulnerabilities.

"South Ukraine's unit 2 was suspended in May 2015 when it reached its original expiry date. But this was only temporary, to allow necessary safety improvements. Seven months later, in December 2015, Ukraine's nuclear regulator decided the reactor can be brought back online and continue working for ten more years, even though 11 safety measures[30] ... had not been implemented."

And now two Zaporizhye reactors have been granted lifespan extensions, bringing the total number of extensions to six. Kiev plans another six lifespan extensions.[5] Until the extension program kicked in, 12 out of Ukraine's 15 power reactors were scheduled for permanent shut-down by the end of this decade.

5.3 Espoo and Aarhus Conventions

Disputes remain unresolved regarding Ukraine's compliance (or non-compliance) with both the Espoo Convention and the Aarhus Convention (the Convention on Access to Information, Public Participation in

[28] Bankwatch, 3 Oct. 2016, 'New life for old nukes in Ukraine means more risk for people and planet', http://bankwatch.org/news-media/for-journalists/press-releases/new-life-old-nukes-ukraine-means-more-risk-people-and-plan

[29] Bankwatch, 17 March 2015, 'Summary of an independent review of the proposed lifetime extension of Unit 1 at the South Ukraine nuclear power plant and its compliance with relevant nuclear safety standards', http://bankwatch.org/publications/summary-independent-review-proposed-lifetime-extension-unit-1-south-ukraine-nuclear-pow

[30] Bankwatch, 8 Dec. 2015, 'Ukraine snubs safety concerns and European donors, extends lifetime of fourth Soviet-era nuclear reactor', http://bankwatch.org/news-media/for-journalists/press-releases/ukraine-snubs-safety-concerns-and-european-donors-extends-

Decision-making and Access to Justice in Environmental Matters) yet Kiev continues to approve reactor lifespan extensions.

In 2013, Ukraine was found to have breached the Espoo Convention for failing to adequately assess the potential impacts of lifespan extensions of the Rivne 1 and 2 reactors on neighbouring countries, failing to consult neighbouring countries, and failing to conduct an Environmental Impact Assessment.[6]

Ukraine's neighbours – Romania, Slovakia, Hungary and Austria – have sent multiple questions for clarification and requests for participation in trans-boundary consultations regarding Ukraine's reactor lifespan extension program. But Kiev, in response, has denied its obligation to conduct any such consultations.[2]

The Espoo Convention's Implementation Committee is the only body with the power to rule on violations of the Convention. The Committee is currently preparing a report, for the June 2017 Meeting of the Parties, on Ukraine's adherence to (or violation of) the Convention.[7]

5.4 Obligations attached to European funding

Numerous European institutions are involved in this complex saga. In March 2013, the European Bank for Reconstruction & Development (EBRD) announced a €300 million loan for reactor safety upgrading in Ukraine, matching €300 million from Euratom. That €600 million (US$660m) amounts to one-quarter of the total EU support to Ukraine's energy sector between 2007-2014.[31]

Funding for safety upgrades is welcome – but the program is badly undermined by Ukraine's failure to abide by safety-related obligations attached to the funding.

Earlier this year, Bankwatch approached the European Commission requesting documents related to Euratom's loans to Ukraine. Bankwatch believes that Ukraine has not met the loan conditions, that it is violating the Espoo and Aarhus Conventions, and that the Espoo Committee's 2013 ruling regarding Ukraine's non-compliance should be considered a precedent applicable to similar cases. Following an inadequate response from the European Commission, Bankwatch took the case to the European Court of Justice. That case is still pending – yet reactor lifespan extension decisions are still being made in Ukraine.[7]

In addition to obligations arising under the Espoo and Aarhus Conventions, each of the two €300 million loans for safety upgrades is conditional on full compliance with international environmental law, include the Espoo Convention. The European Commission has reiterated this obligation on several occasions.[32]

5.5 Energy Community

Ukraine is also under scrutiny by the Energy Community (established by an international treaty in 2005) for its failure to implement the EU's Environmental Impact Assessment Directive, one of the obligations tied to the safety upgrade funding.[9]

Ukraine was required to transpose the Energy Community's Environmental Impact Assessment Directive into national law by 1 January 2013 but still hasn't done so. Issues of concern include, in the Energy Community's words, "provisions on transboundary environmental impact assessment and the improper or

[31] Bankwatch, 17 Nov. 2015, 'Analysis of EU investments in Ukraine's energy sector, 2007-2014', http://bankwatch.org/publications/analysis-eu-investments-ukraines-energy-sector-2007-2014
[32] Dana Marekova, 5 Sept. 2016, 'Ukraine's nuclear energy fixation puts its European financiers to a test', http://bankwatch.org/news-media/blog/ukraines-nuclear-energy-fixation-puts-its-european-financiers-test

incomplete transposition of the provisions on the projects to be covered by an environmental impact assessment, on the information to be included in the impact assessment report and on public participation."[9]

In a 6 September 2016 statement, the Energy Community gave Ukraine two months to "react to the allegation of non-compliance with Energy Community law".[9]

5.6 Growing accident rate at Ukrainian nuclear plants

Nuclear Engineering International reported in August 2016:[33]

"[T]here is growing concern about the condition of Ukraine's NPPs. Former Chernobyl NPP director Mikhail Umanets told a recent press conference in Kiev that he is concerned by the growing number of emergency situations being reported at the plants. He warned that the possibility of an accident at one of Ukraine's four operating NPPs nuclear power plants is increasing.

"The Ukrainian nuclear industry has faced several high-profile incidents recently. In July, a unit at Khmelnitsky NPP was disconnected from the grid following a steam generator leak. In late May, unit 2 at the South Ukraine NPP was forced to stop operations, after operators tripped the station's safety systems. In April, energy production at the Zaporozhye and Rovno plants stopped while faults were investigated. In the spring, all the reactors were at risk of being closed, after Energoatom's foreign currency accounts were frozen and there were no funds to pay for nuclear fuel.

"Umanets noted out that 15 violations were recorded at the plants in 2015, based on the International Nuclear and Radiological Events Scale (INES), which documents both minor incidents and major accidents. That is 1.5 times more than the number of recorded in 2014. In 2016, he added, the INES has already recorded seven violations, double the amount reported during the same period in 2015.

""We run the risk of a serious incident. Since 16 October 2014, Ukraine has not had a chief inspector for nuclear and radiation safety. The position was eliminated, and no self-respecting professional would agree to take it after the cabinet proposed a bill to Ukraine's parliament which stated that 'the inspector's decisions may be cancelled by the head of the state regulator or his designated representative'," he said."

Recommendation: DFAT/ASNO should be asked to comment on reports (e.g. Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns') that the nuclear accident rate is increasing in Ukraine.

5.7 Regulation

As mentioned immediately above, *Nuclear Engineering International* recently cited former Chernobyl director Mikhail Umanets saying that Ukraine does not have a chief inspector for nuclear and radiation safety.[34] That claim requires investigation.
Recommendation: DFAT/ASNO should be asked to comment on reports (e.g. Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns') that Ukraine does not have a chief inspector for nuclear and radiation safety.

[33] Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns', www.neimagazine.com/news/newsukraine-looks-to-npp-life-extension-amid-safety-concerns-4988062
[34] Nuclear Engineering International, 24 Aug. 2016, 'Ukraine looks to NPP life extension amid safety concerns', www.neimagazine.com/news/newsukraine-looks-to-npp-life-extension-amid-safety-concerns-4988062

The text of the Australia–Ukraine Agreement states that the two countries reaffirm the importance ... of ensuring that the use of nuclear energy is safe, well regulated ..."
Recommendation: DFAT/ASNO should be directed to report on their understanding of the nature and adequacy/inadequacy of nuclear regulation in Ukraine.

Article II of the Australia–Ukraine Agreement envisages possible areas and forms of cooperation including nuclear regulation.
Recommendation: DFAT/ASNO should be asked if there are any concrete plans for collaboration in the field of nuclear regulation, and if so, what is the nature of that envisaged collaboration and what funding, if any, has been sought or allocated.

A March 2015 Bankwatch report said that "as part of a governmental decision to suspend all state regulation in Ukraine (with the exception of tax authorities), as of January 2015 SNRIU [State Nuclear Regulatory Inspectorate of Ukraine] is prevented from conducting any safety inspections on their own initiative in nuclear energy facilities across the country."[35]
Recommendation: DFAT/ASNO should be asked to advise as to the accuracy of a March 2015 report stating that as of January 2015 the State Nuclear Regulatory Inspectorate of Ukraine is prevented from conducting any safety inspections on its own initiative, and if so, whether that breaches obligations attached to EBRD funding.

A technical report released by Bankwatch/NECU in March 2015 raises serious concerns regarding nuclear safety standards and regulatory standards.[36]
Recommendation: DFAT/ASNO should be asked to advise as to the accuracy and currency of the concerns raised by Bankwatch/NECU in its March 2015 report, 'Independent review of the proposed lifetime extension of Unit 1 at the South Ukraine nuclear power plant and its compliance with relevant nuclear safety standards'.

5.8 Waste management

There are reports of poorly-shielded spent fuel casks, lacking adequate secondary-containment protection, at the Zaporizhye plant – the closest of Ukraine's nuclear plants to the conflict in eastern Ukraine. These are potential targets of a deliberate attack or a stray missile. *The Guardian* reported in May 2015 that more than 3,000 spent fuel rods are kept inside metal casks and concrete containers in an open-air yard close to the perimeter fence at Zaporizhye. Gustav Gressel from the European Council of Foreign Relations said "the Russians use a large amount of multiple rocket-propelled systems that are not entirely precise, and they don't really care where they land." Around 770,000 people live in the city of Zaporizhye.[37]

The text of the Australia–Ukraine Agreement states that each party "shall take all necessary measures to ensure that nuclear safety and radioactive waste management is consistent, as appropriate, with the provisions of the ... Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management ..."
Recommendation: DFAT/ASNO should be asked to advise as to whether nuclear waste management in Ukraine is consistent with Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, with particular reference to spent fuel stored at the Zaporizhye nuclear

[35] http://bankwatch.org/news-media/for-journalists/press-releases/new-study-sounds-alarm-safety-ukrainian-nuclear-power-plan
[36] http://bankwatch.org/sites/default/files/summary-SUNPP1-safetystandards-17Mar2015.pdf
[37] Arthur Neslen, 13 May 2015, 'Nuclear waste stored in 'shocking' way 120 miles from Ukrainian front line', www.theguardian.com/environment/2015/may/06/nuclear-waste-stored-in-shocking-way-120-miles-from-ukraine-front-line

plant and reports that spent fuel is inadequately protected there (e.g. *The Guardian*, 13 May 2015, 'Nuclear waste stored in 'shocking' way 120 miles from Ukrainian front line').

An April 2016 report raises further concerns regarding nuclear waste management in Ukraine. The report reads, in part: "Every nuclear operator has to put aside money to later decommission its nuclear power plant(s) and manage its high level nuclear waste for the next 100,000 years. In order to do so, reserves are built up during the operation time of a nuclear power station, normally in the form of a fixed amount per kWh sold. Ukraine decided to lower this amount, slowing down the build-up of these reserves. This has created a shortage in these reserves, which is now used as an argument to continue operating ageing reactors to create at least some income for another 20 years."[38]
Recommendation: DFAT/ASNO should be asked to advise as to the accuracy of claims that the Ukrainian government has lowered the amount of money operators must put aside for managing nuclear waste and the implications of any such lowering.

6. SAFEGUARDS IN UKRAINE

6.1 Have IAEA inspections being carried out in Ukraine recent years?

DFAT/ASNO rhetoric about "stringent" safeguards would suggest that IAEA safeguards inspections in Ukraine (and other comparable countries) is regular and routine. In truth, there is simply no way of knowing whether safeguards inspections have been carried out in Ukraine, which facilities have been inspected, what the findings were, etc. The IAEA and the Australian government refuse to publicly release that information (and in the case of the Australian government, it may know little more than the rest of us).

The IAEA Annual Report 2015[39] ought to shed light on safeguards inspections in Ukraine – and in particular many people would be interested to know about inspections of nuclear facilities in Crimea and conflict-ridden eastern Ukraine. But the Annual Report does not shed any light on those issues. The IAEA Safeguards Statement 2015[40] states that "the Secretariat found no indication of the diversion of declared nuclear material from peaceful nuclear activities and no indication of undeclared nuclear material or activities" in 67 nation-states including Ukraine. That is comforting as far as it goes, but questions need to be answered, and since the IAEA refuses to answer them, they should be put to DFAT/ASNO.
Recommendation: DFAT/ASNO should be asked to respond to the following questions:
– Can DFAT/ASNO provide detailed information on IAEA safeguards inspections in Ukraine over the past three years (the number of inspections, sites inspected, findings etc?
– Does the IAEA hold information on safeguards inspections in Ukraine which is not available to the Australian government?
– Have inspections been carried out in contested or conflict-ridden regions of Ukraine (Crimea, eastern Ukraine) over the past three years and can DFAT/ASNO provide details?
– Have IAEA inspections in contested or conflict-ridden regions of Ukraine (Crimea, eastern Ukraine) been in any way compromised or delayed?
– Are IAEA inspections in Crimea conducted under the IAEA/Ukraine Agreement or the IAEA/Russia Agreement?

[38] Jan Haverkamp and Iryna Holovko, 25 April 2016, 'Towards a post-nuclear Ukraine', www.opendemocracy.net/od-russia/jan-haverkamp-iryna-holovko/towards-post-nuclear-ukraine
[39] https://www.iaea.org/sites/default/files/gc60-9.pdf
[40] https://www.iaea.org/sites/default/files/16/08/statement_sir_2015.pdf

A dispute about Ukrainian or Russian sovereignty over Crimea and its relevance to IAEA safeguards is discussed in a March 2014 *Nuclear Threat Initiative* article.[41] At the time (March 2014) the IAEA seemed to be siding with Ukraine but that would appear to be an increasingly problematic basis for IAEA inspections as Russian control over Crimea has been consolidated. Are IAEA inspections (if any) now carried out under the IAEA/Russia agreement? Research reactors are located in Crimea, along with two nuclear waste repositories and nuclear materials requiring safeguarding.[42]

It is certainly the case that IAEA safeguards inspections have been suspended or deferred in a number of countries over the decades as a result of domestic or international political turmoil or military conflict − examples include Iraq, Yugoslavia and several African countries. And there remains the potential for conflict in Ukraine to compromise safeguards inspections (if indeed this has not already happened).

Ukraine noted in its report to the 2016 Nuclear Security Summit that state nuclear inspectors were unable to safely perform their duties in Crimea and certain areas of Donetsk and Luhansk regions in 2014 (or parts of 2014).[43] The report states that three "repositories of radioactive waste and sources of ionizing radiation" were located in "temporarily occupied territories" in Crimea (two repositories) and near the city of Donetsk (one repository). It isn't clear if state inspections of other nuclear facilities have been (or still are) compromised. In light of Ukraine's loss of regulatory control, it is by no means a stretch to envisage IAEA safeguards inspectors being unable to perform their duties. And given the pervasive secrecy surrounding safeguards, perhaps IAEA safeguards inspections have already been compromised or delayed.

6.2 IAEA findings / reports

The text of the Australia–Ukraine Agreement states: "If nuclear material subject to this Agreement is present in the territory of Australia or Ukraine, that Party shall, upon the request of the other Party, provide the other Party in writing with any conclusions which the Agency [IAEA] has drawn from its safeguards activities, insofar as they relate to nuclear material subject to this Agreement."

If uranium sales to Ukraine proceed, IAEA safeguards reports regarding Ukraine should be publicly released as a matter of course. Apart from the general principle of transparency, circumstances can be envisaged whereby the Australian government does not want Australian citizens to know that there are concerns regarding the safeguarding of AONM in Ukraine. Hence the need for IAEA safeguards reports regarding Ukraine to be publicly released as a matter of course.

Recommendation: The JSCOT should recommend negotiations such that IAEA safeguards reports regarding Ukraine are sent to Australia as a matter of course, not just on Australia's request, and that the reports are publicly released.

6.3 Fallback safeguards

The Australia–Ukraine Agreement addresses the potential need for fallback safeguards in the event that the IAEA "fails to administer its functions under the agreements". The Agreement says that in those circumstances, "the Parties shall immediately arrange for the application of safeguards satisfactory to both Parties which conform with Agency safeguards principles and procedures and which provide reassurance equivalent to the safeguards system they replace."

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[41] 'U.N. Atomic Agency Faces Pressure From Both Sides of Crimea Dispute', March 31, 2014, http://www.nti.org/gsn/article/un-atomic-agency-faces-crimea-dispute
[42] 'National Progress Report: Ukraine', March 31, 2016, report to 2016 Nuclear Security Summit, www.nss2016.org/document-center-docs/2016/3/31/national-progress-report-ukraine
[43] Ibid.

That wording is immensely problematic in the case of Australia's bilateral agreement with Russia – where IAEA safeguards inspections are few and far between. As applied to Ukraine, the provision for fallback safeguards needs to be backed up by realistic plans. Does ASNO have any hands-on safeguards expertise? Does it have contingency plans to acquire (or hire) such expertise at short notice if it is required? ASNO may need to implement contingency plans in double-quick time if conflict between Russia and Ukraine spreads and escalates.

Recommendation: ASNO should be required to provide the JSCOT with credible plans regarding the implementation of fallback safeguards.

6.4 Return of AONM

Commenting generally (not specifically in relation to Ukraine), ASNO's Director-General has stated that "ASNO believes that the likelihood of a situation arising where the right of return [of AONM] is invoked is very remote."[44] It is indeed a remote possibility for most of Australia's uranium customer countries – but not Ukraine. What happens if Russian troops, or Russian-armed insurgents, move westwards in the direction of nuclear power plants in Ukraine? The rapid removal of AONM may be the only method of securing it. Plans for the rapid removal of AONM need to be in place – but they are not.

Friends of the Earth believes that securing nuclear materials – particularly fissile material, including fissile material contained in spent fuel – is a top-order priority. If securing AONM means transporting it from Ukraine for storage in Australia in the event of increased conflict between Russia and Ukraine (or other circumstances posing an unacceptable security risk), so be it.

In 2015 John Carlson, former Director-General of ASNO, said: “All our other agreements provide that, if there is a violation, we have the right to take back what we have supplied. How that would work in practice is another story, of course. I do not think we would be keen to take back spent fuel.”[45] But spent fuel might be the material of greatest concern – because it contains fissile material.

The DFAT/ASNO National Interest Analysis states: "Article XVI confirms that each Party has the right to suspend or cancel further transfer of items and to require the receiving Party to take corrective steps if the receiving Party is in material non-compliance with IAEA safeguards arrangements or is in material non-compliance with the proposed Agreement. Further, either Party can require the return of items subject to the proposed Agreement in circumstances where such corrective steps are not implemented within a reasonable time period (90 days following the conclusion of consultations or a longer period as otherwise agreed)."

The National Interest Analysis (and the treaty text) refer specifically to non-compliance with IAEA safeguards arrangements, but are non-specific regarding the potential return of AONM in the event of heightened conflict between Russia and Ukraine or other circumstances jeopardising the security of AONM in Ukraine.

It beggars belief that DFAT/ASNO have taken such a *laissez-faire* attitude towards the potential need to return AONM in the event of security threats (or – less likely – proliferation threats). Mechanisms need to be in place for the rapid return of AONM should the need arise. That includes mechanisms for consultation and agreement with Ukraine and other interested parties (e.g. the USA if AONM is also US-obligated).

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[44] See Appendix 1 in David Noonan's submission to this inquiry. www.aph.gov.au/DocumentStore.ashx?id=0ac3b8c3-ccd3-4ef3-a065-a2247a0713dc&subId=414721
[45] JSCOT Report #151, sec 6.65

Recommendation: DFAT/ASNO should be asked to detail the circumstances under which security threats (as opposed to proliferation concerns) would lead to the return of AONM to Australia, the process that would need to be followed, the amount of time that would be required to negotiate and carry out the return of AONM (and the consistency of that timeframe with the potential need to remove AONM from Ukraine as a matter of urgency), legal and regulatory issues in Australia, where the AONM might be stored in Australia, etc.

As things stand, return is only envisaged following a protracted negotiation (and possibly dispute) with Ukraine. That is clearly unacceptable.

It appears that DFAT/ASNO have no idea where returned AONM would be stored in Australia – that is clearly unacceptable.

It appears that DFAT/ASNO have no idea how AONM would be transported from Ukraine to Australia – that is clearly unacceptable. Plans and contingency plans should be in place.

A situation can be envisaged whereby Australia seeks the rapid return of AONM, Ukraine disagrees, and there is no option other than to engage Ukraine in a protracted negotiation and dispute-resolution process. That is unacceptable. Far better to negotiate stronger, quicker mechanisms for the return of AONM before the Australia-Ukraine Agreement is finalised and before uranium exports begin.
Recommendation: The JSCOT should recommend negotiations with Ukraine, and amendments to the Agreement, such that AONM can be quickly removed and transported to Australia in the event of unacceptable security threats.

One of the reasons that ASNO appears to use to justify its *laissez-faire* attitude towards AONM return is that the material might have other obligations attached (eg US-obligated) and thus might be transferred to a country other than Australia. But in practice that might complicate and further delay a requirement to rapidly transfer nuclear materials out of Ukraine for security reasons – because the agreement of third countries (such as the USA) would be required. It would be possible to facilitate such arrangements – for example the US and Australia could come to a pre-arranged agreement such that there is no need for protracted discussions and negotiations at a time when nuclear material needs to be moved quickly. But for Australia to take such prudent steps, DFAT/ASNO first need to understand that their current *laissez-faire* attitude is unacceptable.

6.5 Reprocessing

An important provision in bilateral agreements is for prior (or programmatic) Australian consent before reprocessing. However no Australian government has ever refused permission to separate plutonium from spent fuel via reprocessing. Even when reprocessing leads to the stockpiling of plutonium (which can be used directly in nuclear weapons), ongoing or 'programmatic' permission has been granted by Australian governments. Hence there are stockpiles of Australian-obligated separated plutonium in Japan and in some European countries.

The text of the Australia–Ukraine Agreement includes the usual requirement for prior written consent before reprocessing of Australia-obligated nuclear materials (spent fuel).

Recommendation: DFAT and ASNO should be asked to advise as to whether they envisage programmatic consent, or case-by-case consent for reprocessing by Ukraine (presumably in another country since Ukraine does not have a large reprocessing plant – it only has hot cell facilities servicing research reactors).

The Australia–Ukraine Agreement should simply disallow the possibility of reprocessing. Reprocessing is largely discredited technology, it is clearly on the decline worldwide and the demise of reprocessing is highly advantageous with respect to proliferation.

A weaker but still useful amendment to the Agreement would be a clause prohibiting reprocessing in Ukraine, thus providing some sort of disincentive to the development of large-scale reprocessing technology in Ukraine (similar to the 'gold standard' set by the US in its agreement with the UAE – UAE agreed to forego domestic enrichment and reprocessing).

Recommendation: The JSCOT should recommend renegotiation of the Treaty text such that the possibility of reprocessing of AONM (in Ukraine or elsewhere) is precluded or, failing that, renegotiation such that reprocessing in Ukraine is precluded.

Ukraine is an NPT state with an Additional Protocol in place. However the country's small nuclear weapons lobby is of some concern, particularly in a highly fluid political situation with the potential for extremists to assume considerably greater political power in a short space of time. As an example of nuclear weapons sabre-rattling, Mikhail Golovko from Ukraine's 'Svoboda' (Liberty) party said in 2014: "Russia cannot win in this situation, it is a violation of all international norms and guarantees. If they are violated, we reserve the right to recover a nuclear weapon. ... We'll regain our status as a nuclear power and that'll change the conversation. Ukraine has all the technological means needed to create a nuclear arsenal – which would take us about three to six months."[46]

6.6 Unacceptable secrecy

Nuclear transfers and developments demand the highest level of transparency, however this is often not the case, and it is not the case with the Australia–Ukraine Agreement.

Recommendation: The JSCOT should recommend amendments to the Agreement requiring public disclosure of:
i) Any separation and stockpiling of Australian-obligated plutonium.
ii) The Administrative Arrangements (which contain vital information about the safeguards arrangements required by Australia – including Ukraine's system of accounting for and control of AONM).
iii) All IAEA safeguards reports concerning Ukraine.
iv) Information on nuclear accounting discrepancies (Material Unaccounted For – MUF) including the volumes of nuclear materials, and the reasons given to explain accounting discrepancies. The JSCOT has previously recommended that: "Further consideration is given to the justification for secrecy of 'Material Unaccounted For'."[47] There is no legitimate justification for the secrecy surrounding MUF. ASNO has done no better than to cite commercial confidentiality.[48] Some other countries (e.g. Japan) release MUF data and thus Australia's secrecy clearly fails to meet best practice.
v) The quantities of different types of AONM held in Ukraine (and on-sent to third countries). This information is currently confidential but there is no legitimate reason for that secrecy. ASNO states: "The

[46] www.eureporter.co/world/2014/03/12/has-a-ukraine-nuclear-missile-crisis-just-begun/ http://rt.com/news/ukraine-nuclear-arsenal-threat-314/
[47] Joint Standing Committee on Treaties, 2008, 'Report 94: Review into Treaties tabled on 14 May 2008', List of Recommendations, www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/report1/fullreport.pdf
[48] www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/subs/sub22_1.pdf

actual quantities of AONM held in each country, and accounted for by that country pursuant to the relevant agreement with Australia, are considered by ASNO's counterparts to be confidential information."[49]
vi) Further to the previous point, the DFAT/ASNO National Interest Analysis states that Ukraine is required to provide an annual report on all transactions and inventories involving AONM. That report should be publicly released. If there are legitimate concerns (e.g. security concerns regarding the public release of information on fissile material holdings at particular facilities), then the report should be released with redactions.

6.7 Retransfers

The text of the Australia–Ukraine Agreement requires prior Australian consent before AONM is transferred to a third country, unless that third country has a Nuclear Cooperation Agreement in place with Australia (in which case notification is required following the transfer).

The situation could arise whereby AONM is transferred to a nation with i) unacceptably weak safety, safeguards or security standards (notwithstanding the existence of a bilateral agreement with Australia) and/or ii) safety, safeguards and security standards weaker than those in Ukraine. In the event of a thawing of relations between Ukraine and Russia, the likelihood of those scenarios greatly increases. It will be remembered that the then Australian government rejected JSCOT's recommendation that uranium sales to Russia should not occur unless "actual physical inspection by the IAEA occurs" at any Russian sites that may handle Australian uranium and that "the supply of uranium to Russia should be contingent upon such inspections being carried out."

Recommendation: The JSCOT should recommend an amendment to the Agreement such that prior Australia consent is required for any transfer of AONM to a third country, with no exception for countries that have a bilateral agreement with Australia in place.

6.8 Trusting an untrustworthy partner

Ukraine's democracy is fragile and superficial; it might more accurately be described as an oligarchy and a kleptocracy[50] than a democracy notwithstanding recent, fragile reforms.[51] Thus Australia revisits the problem faced with uranium sales to China, Russia and proposed sales to UAE: placing trust in untrustworthy partners. It might be argued that it would be unfair to refuse to entrust uranium to Ukraine when uranium sales have been approved to other undemocratic nation-states. A more logical approach would be to cap and reduce the number of untrustworthy nation-states entrusted with Australian uranium.

7. SECURITY CONCERNS

7.1 Nuclear security issues in Ukraine and Ukraine's March 2016 report to the Nuclear Security Summit

The conflict in eastern Ukraine and Crimea since 2014 raises serious questions about the possibility of adequately securing AONM. According to the IAEA, there are 31 nuclear-related facilities in Ukraine that

[49] ASNO − Australian Safeguards and Non-proliferation Office, 2001-02, Annual Report, www.asno.dfat.gov.au/annual_report_0102/asno_annual_report_2001_2002.pdf
[50] Joss Meakins, 12 April 2016, 'Oligarchs: good old buddies who own Ukraine', http://euromaidanpress.com/2016/04/12/oligarchs-good-old-buddies-who-own-ukraine-uareforms/#arvlbdata
[51] http://carnegieeurope.eu/strategiceurope/?fa=61671

are subject to monitoring by the IAEA. They include 15 power reactors located at four plants (not including the Chernobyl plant with four reactors which have been permanently shut down).[52]

Ukraine acknowledges that it has lost regulatory control of nuclear materials and facilities in parts of eastern Ukraine and Crimea (discussed below). Clearly there exists the potential for further loss of control. Clearly the export of Australian uranium would bring with it the potential for loss of control of AONM.

Numerous nuclear-related security incidents have been reported since 2014. Here is a list of some incidents and threats and government responses:
– Protesters seized the headquarters of Ukraine's energy ministry on 25 January 2014, but left several hours later.[53] Eduard Stavitskiy, who was at the time Ukraine's energy minister, reportedly said that all the country's nuclear power facilities were put on high alert after the seizure.[54]
– In May 2014, the Zaporizhye nuclear plant was the backdrop to an armed confrontation between men from Right Sector (a pro-Ukrainian paramilitary force), security guards from the plant and police. The Right Sector men said they had come to remove pro-Russian agitators who, they claimed, had been operating inside the plant. The Right Sector men were eventually disarmed.[55]
– In late January 2014, Ukraine's Security Service reported "anonymous threats to blow up hydropower and nuclear power plants, damage to which may have unforeseen and extremely serious consequences for the population of Ukraine and neighbouring states."[56]
– On 2 March 2014, Ukraine's parliament called for international assistance to protect its nuclear power plants.[57]
– Ukraine's then Prime Minister Arseniy Yatsenyuk said in March 2014 that his nation was preparing to mobilise armed forces to protect strategic locations including nuclear power plants.[58]
– Ukraine's envoy to the IAEA, Ihor Prokopchuk, said in a letter to the IAEA Director General in March 2014: "Illegal actions of the Russian armed forces on Ukrainian territory and the threat of use of force amount to a grave threat to security of Ukraine with its potential consequences for its nuclear power infrastructure. ... Under these circumstances, the competent authorities of Ukraine make every effort to ensure physical security, including reinforced physical protection of 15 power units in operation at four sites of Ukrainian [nuclear power plants]." Prokopchuk urged the IAEA to "urgently raise the issue of nuclear security with the authorities of the Russian Federation."[59]
– Andrii Deshchytsia, Ukraine's acting foreign affairs minister, warned on 25 March 2014 of a "potential threat to many nuclear facilities and other critical infrastructure on the territory of Ukraine, including in Crimea. There is no immediate danger. However, if the situation aggravates Ukraine [we] may be in need of international assistance to protect these facilities."[60]

Nuclear waste is another security concern. As previously mentioned, there are reports of poorly-shielded spent fuel casks, lacking adequate secondary-containment protection, at the Zaporizhye plant – the closest of

[52] www.reuters.com/article/2014/03/04/us-ukraine-crisis-iaea-idUSBREA231V820140304
[53] www.csmonitor.com/World/Latest-News-Wires/2014/0125/Kiev-protesters-said-to-have-captured-two-police-officers
[54] www.csmonitor.com/World/Latest-News-Wires/2014/0125/Kiev-protesters-said-to-have-captured-two-police-officers
[55] Oliver Carroll, 28 Dec. 2014, 'Ukraine turns off reactor at its most powerful nuclear plant after 'accident'', www.independent.co.uk/news/world/europe/ukraine-turns-off-reactor-at-nuclear-plant-after-accident-9947540.html
[56] http://penzanews.ru/en/opinion/55043-2014
[57] www.reuters.com/article/2014/03/02/ukraine-crisis-nuclear-idUSL1N0LZ07H20140302
[58] http://edition.cnn.com/2014/03/01/world/europe/ukraine-politics/
[59] www.reuters.com/article/2014/03/04/us-ukraine-crisis-iaea-idUSBREA231V820140304
www.business-standard.com/article/international/ukraine-tightening-nuclear-security-114030500586_1.html
[60] www.nti.org/gsn/article/russia-denies-threatening-ukraines-atomic-facilities/

Ukraine's nuclear plants to the conflict in eastern Ukraine. These are potential targets of a deliberate attack or a stray missile.[61]

It is impossible to accurately gauge the scale of the nuclear security problem in Ukraine over the past 2.5 years – too much of the available 'information' is coloured by the Ukrainian and Russian governments' attempts to downplay or exaggerate risks and problems. To give one example, *rt.com* reported that a November 2015 attack on transmission towers that cut off the delivery of power from Ukraine to Crimea also created an emergency situation at nuclear power plants.[62] But the accuracy of the report is open to question as the source is Russian government-linked.

Despite Ukraine's efforts to secure nuclear facilities and materials, its loss of control is nothing short of alarming. Ukraine stated in its March 2016 report to the 2016 Nuclear Security Summit (NSS): "Organization and implementation of measures for physical protection of the Ukrainian nuclear power plants (NPPs) is being carried out under real threats caused by the Russian aggression in eastern Ukraine and deterioration of social and political situation in the country. In these conditions, to ensure stable operation of nuclear power facilities, significant efforts are directed at strengthening physical protection, defense and practical training focused on anti-terrorism and anti-sabotage measures at nuclear power plants. Systematic monitoring of crisis situations and development of new approaches to protect nuclear facilities are underway."[63]

Ukraine's March 2016 NSS report further states that new coordination plans "in case of sabotage and relevant Action Plans in case of crisis situation were developed and introduced at all Ukrainian NPPs."

Ukraine's March 2016 NSS report states: "Russian military aggression in eastern Ukraine and its attempt of illegal annexation of the Autonomous Republic of Crimea pose new threats to the national system of nuclear and radiation security and resulted in loss of regulatory control in those areas."

The report goes on to provide a long list of "sources and facilities [that] **remain without regulatory control** in the Eastern Ukraine" (presumably that means that regulatory control was still lacking when the report was released, in March 2016 – and may still be lacking as of October 2016). That list includes 1200 radionuclide sources of ionizing radiation; 65 entities that use sources of ionizing radiation (including eight that have high-level radiation sources of category 1 with activity of more than 1000 Ci); Donetsk specialized radioactive waste management enterprise; one repository of radioactive waste and sources of ionizing radiation near Donetsk chemical plant; radiation sources in two coal mining facilities of Donbas (142 radiation sources, with the maximum activity of a single source of 2.35×10e11 Bq).

The NSS report goes on to note that Ukraine has **lost regulatory control** of the following sources and facilities located on the territories of the Autonomous Republic of Crimea and the city of Sevastopol:
– Research reactor of the Sevastopol National University of Nuclear Energy and Industry: DR-100 research reactor, DR-100 (critical assembly) physical test bench, subcritical uranium water assembly, about 3488 kg of depleted uranium;

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[61] Arthur Neslen, 13 May 2015, 'Nuclear waste stored in 'shocking' way 120 miles from Ukrainian front line', www.theguardian.com/environment/2015/may/06/nuclear-waste-stored-in-shocking-way-120-miles-from-ukraine-front-line

[62] 23 Nov 2015, 'Ukraine nuclear power plants 'dangerously' without power as towers feeding energy to Crimea blown up', www.rt.com/news/323060-ukraine-nuclear-plants-danger/
21 Nov 2015, 'State of emergency, blackout in Russia's Crimea after transmission towers in Ukraine blown up', www.rt.com/news/323012-crimea-blackout-lines-blown-up/

[63] 'National Progress Report: Ukraine', March 31, 2016, report to 2016 Nuclear Security Summit, www.nss2016.org/document-center-docs/2016/3/31/national-progress-report-ukraine

– 277 radionuclide sources of ionizing radiation;
– 53 entities that use radionuclide sources of ionizing radiation, six of them use category 1 and 2 radiation sources according to the level of potential hazard (medicine, shipbuilding) in which over 1200 kg of depleted uranium is used as biological shielding;
– 2 nuclear waste repositories.

The NSS report states: "At present Ukraine cannot guarantee physical protection of the above-mentioned research reactor, nuclear material and sources of ionizing radiation on the territory of Crimea, city of Sevastopol and certain areas of Donetsk and Luhansk regions. Given the occupation of the Autonomous Republic of Crimea by the Russian Federation and ongoing anti-terrorist operation in eastern Ukraine, any damage to radiation-hazardous objects located on those territories may lead to dire consequences not only for Ukraine but for many European nations as well. Thus, we consider that the issue of establishing international control over nuclear facilities that can be seized or damaged as a result of military actions, requires immediate international attention."

7.2 Recent attempts to foment unrest near a nuclear power plant

The following September 2016 article from *The Times* (UK) comments on recent attempts to foment unrest in Zaporizhia – a city adjacent to a 4-reactor nuclear power plant – and two towns near Zaporizhia, Dnipropetrovsk and Andronivka:
Vladimir Putin ordered plot to seize half of Ukraine[64]
The Ukrainian intelligence service claims to have captured Kremlin agents operating deep within territory not embroiled in fighting, as telephone intercepts were published revealing a Moscow plot to seize half the country.
Two agents were based in the Dnipropetrovsk region, 150 miles from the conflict between pro-western government forces and Russian and rebel troops in eastern Ukraine. The intelligence service alleged that the agents were supervised by Moscow and had established groups advocating "for the creation of the 'Dnipropetrovsk People's Republic'" that would join Russia.
Another group was intercepted at Andronivka, about 60 miles from the front line, transporting a rocket-propelled grenade launcher, antipersonnel mine and ammunition.
The activities were a continuation of the hybrid warfare methods used to annex Crimea and create an insurrection in Ukraine's eastern Donetsk and Luhansk regions, intelligence agents said.
On Tuesday the Ukrainian embassy in London published telephone intercepts from the aftermath of Kiev's bloody uprising against its pro-Russia president in 2014. President Putin wrested control of Crimea from the new western-leaning government and covertly sent troops into the eastern regions.
The audio appears to capture Sergey Glazyev, a top adviser to Mr Putin, instructing paid Russian sympathisers to organise protests and seize government buildings across Russian-speaking areas of Ukraine.
"I have direct instructions to raise the people in Ukraine, wherever we can. So, we need to bring people out onto the streets ... and do it as soon as possible," Mr Glazyev appears to say. "Because, do you understand it, the president has already signed the order, the operation has started, and we are informed that the military men are already moving out."
Yuriy Lutsenko, the Ukrainian prosecutor-general, said that he planned to use the recordings to pursue war crimes charges against Russian generals and political leaders at the International Criminal Court. He summoned Mr Glazyev for questioning.
In his response to Ukrainian prosecutors, the Putin adviser dismissed the charges as "delirium", although he did not comment directly on the recordings. He added that he refused to recognise the government in

[64] Maxim Tucker, 15 Sept 2016, 'Vladimir Putin is accused of ordering for half of Ukraine to be seized', The Times, http://www.theaustralian.com.au/news/world/the-times/vladimir-putin-ordered-plot-to-seize-half-of-ukraine/news-story/aa9dba0d5e431067fa40feb73c91ee7f

Kiev as a legal authority and said that "citizens across Ukrainian regions have a legitimate reason" to hold referendums on breaking away.
Mr Glazyev appears to tell Russian sympathisers to seize administrative centres in Kharkiv, Odessa and Zaporizhia, all outside the conflict zone. Kharkiv is an important industrial city, Odessa is a key port and Zaporizhia is home to Ukraine's largest nuclear power station.
"The people should gather in the square and ask Russia to help against Banderists [slang for Ukrainian nationalists]. The specially trained personnel should knock the Banderists out from the building of the regional council, and then they should gather a regional council and create an executive authority to take control of the militia," Mr Glazyev allegedly says in one call.

7.3 Worst-case scenarios

Any number of scenarios could potentially develop from the simmering Ukrainian–Russian conflict and the broader geopolitical conflicts surrounding the regional conflict – attacks or accidental strikes on nuclear plants by sub-national groups or nation-states, regional conflict sparking conflict between nuclear-armed superpowers, cyberattacks[65], insider attacks[66], the possibility that Ukraine's small atomic bomb lobby will grow in strength, etc. Most of those scenarios are low probability but potentially very high impact.

Bennett Ramberg, a former policy analyst with the US State Department, describes some low probability but potentially very high impact scenarios in an April 2014 article:[15]

"History offers little guidance as to whether warring countries would avoid damaging nuclear sites. With the exception of the 1990s' Balkan conflict, wars have not been fought against or within countries with nuclear reactors. In the case of the Balkans, Serbian military jets overflew Slovenia's Krško nuclear power plant in a threatening gesture early in the conflict, while radical Serbian nationalists called for attacks to release the radioactive contents. Serbia itself later issued a plea to Nato not to bomb its large research reactor in Belgrade. Fortunately, the war ended with both reactors untouched.

"While that case provides some assurance that military and political leaders will think twice about attacking nuclear reactors, the sheer scale of Ukraine's nuclear enterprise calls for far greater global concern. ... Concentrated in four locations, Ukraine's pressurized water reactors differ from the less stable Chernobyl RBMK design, yet still remain capable of releasing radioactive contents should safeguards fail. Given that Russia, too, suffered serious consequences from the Chernobyl accident, it is to be hoped that the Kremlin would recoil at the idea of bombing the plants intentionally. But warfare is rife with accidents and human error, and such an event involving a nuclear plant could cause a meltdown.

"A loss of off-site power, for example, could be an issue of serious concern. Although nuclear plants are copious producers of electricity, they also require electrical power from other sources to operate. Without incoming energy, cooling pumps will cease functioning and the flow of water that carries heat away from the reactor core – required even when the reactor is in shutdown mode – will stop.

"To meet that risk, nuclear plants maintain large emergency diesel generators, which can operate for days – until their fuel runs out. The reactor meltdowns at Japan's Fukushima Daiichi power station in 2011 demonstrated what happens when primary and emergency operating power are cut.

[65] Michael Toecker, 1 May 2016, 'Why Power Generators Can't Ignore the Ukraine Cyberattack', www.powermag.com/power-generators-cant-ignore-ukraine-cyberattack/
[66] Matthew Bunn and Scott Sagan, April 2014, 'A Worst Practices Guide to Insider Threats: Lessons from Past Mistakes', Occasional Paper, American Academy of Arts & Sciences, www.amacad.org/content/publications/publication.aspx?d=1425

"Such vulnerabilities raise troubling questions in the event of a war. Fighting could disrupt off-site power plants or transmission lines servicing the reactor, and could also prevent diesel fuel from reaching the plant to replenish standby generators. Operators could abandon their posts should violence encroach.

"Moreover, combatants could invade nuclear plants and threaten sabotage to release radioactive elements to intimidate their opponents. Others might take refuge there, creating a dangerous standoff. A failure of military command and control or the fog of war could bring plants under bombardment.

"Serious radiological contamination could result in each of these scenarios. And, though no one stands to gain from a radioactive release, if war breaks out, we must anticipate the unexpected.

"In Ukraine, nuclear emissions could exceed both Chernobyl and Fukushima. Wartime conditions would prevent emergency crews from getting to an affected plant to contain radiological releases should reactor containments fail. And, with government services shut down in the midst of fighting, civilians attempting to escape radioactive contamination would not know what to do or where to go to protect themselves."

Ramberg states that with the exception of the 1990s Balkan conflict, wars have not been fought against or within countries with nuclear reactors. That is only true if the reference to reactors is understood to mean operating power reactors. There is a long history of conventional military strikes and attempted strikes on nuclear plants in the Middle East − the destruction of research reactors in Iraq by Israel and the US; Iran's attempts to strike nuclear facilities in Iraq during the 1980-88 war (and *vice versa*); Iraq's attempted strikes on Israel's nuclear facilities; and, most recently, Israel's bombing of a suspected nuclear reactor site in Syria in 2007. In the Middle East, attacks have mostly targeted small research reactors and related facilities (though there are exceptions, including Iraq's attack on the partially-built Bushehr nuclear power plant in Iran in 1987) and the aim has been to curb or prevent weapons proliferation. In the case of nuclear power plants (or reprocessing facilities), attacks (by an adversarial nation-state or sub-national group) could also serve other purposes − spreading radioactive contamination far and wide, and/or disrupting electricity supply.

7.4 Implications for proposed Australian uranium sales to Ukraine

The DFAT/ASNO National Interest Analysis states:
"Australian uranium, and nuclear material derived from its use (such as plutonium), that is subject to obligations under Australia's bilateral nuclear cooperation agreements is termed Australian obligated nuclear material (AONM). In response to the risks posed by the current tensions between Ukraine and Russia, the proposed Agreement includes clauses designed to minimise any security concerns involving AONM transferred to Ukraine. In addition to including standard assurances that internationally approved standards of physical protection will apply (Article VI), the proposed Agreement allows Australia to review physical protection measures (Article VI.3) and for the development of a facilities list, limiting the locations where AONM can be processed, used or stored to those that have been approved by Australia (Article VIII)."

DFAT/ASNO should be congratulated for negotiating nuclear security agreements above and beyond those applying to other countries. (We wonder in passing if the requirement for an agreed facilities list is not standard in other bilateral agreements?)

That said, will the proposed arrangements secure AONM if Russian troops, or Russian-armed insurgents, move westwards in the direction of nuclear power plants in Ukraine? The proposed arrangements provide no guarantee. Most likely, Ukrainian regulatory control of nuclear materials and facilities would be lost, just as

it already has in parts of eastern Ukraine and in Crimea. If IAEA safeguards have not already been compromised, they likely would be compromised in the event of a spreading and escalation of conflict.

Sergiy Bozhko, chair of the State Nuclear Regulatory Inspectorate of Ukraine, told *The Guardian* in May 2015: "Given the current state of warfare, I cannot say what could be done to completely protect installations from attack, except to build them on Mars."[67]

The rapid removal of AONM may be the only method of securing AONM – hence the need for concrete plans for the rapid removal of AONM from Ukraine (discussed elsewhere in this submission).

7.5 Russian precedent

AONM in Russia has not in any way been undermined by Russia's military activities abroad. Nevertheless those activities underpinned Canberra's decision to suspend uranium sales to Russia and Russia's possession of AONM presents several problems, e.g. the high likelihood that there have been no IAEA inspections of AONM in Russia, and practical and possibly legal questions and difficulties that would attend a decision to insist on the return of AONM to Australia.

Similar problems could arise with uranium sales to Ukraine, along with numerous other potentially more serious problems stemming from simmering conflict.

7.6 Russian statements regarding Australian uranium sales to Ukraine

The Age reported in December 2014 that a spokesman for Moscow's embassy in Canberra branded talk of a uranium deal between Australia and Ukraine as a "political statement" and warned that given the conflict in eastern Ukraine, nuclear material could "fall into the wrong hands" and Australia should bear in mind that eastern Ukraine was "a conflict zone". Russian embassy spokesman Alexander Odoevskiy said: "Given Ukraine's current geopolitical situation, can it provide enough security for this nuclear industry and safeguards so [uranium] doesn't fall into the wrong hands? I'm not sure about whether the government institutions in Ukraine are capable of providing these stringent controls."[68]

If the Russian government disapproves of Australian uranium sales to Ukraine, what consequences might that have? Might it, for example, complicate any attempt to repatriate AONM from Russia?

[67] Arthur Neslen, 13 May 2015, 'Nuclear waste stored in 'shocking' way 120 miles from Ukrainian front line', www.theguardian.com/environment/2015/may/06/nuclear-waste-stored-in-shocking-way-120-miles-from-ukraine-front-line

[68] David Wroe, 12 Dec 2014, 'Ukrainian President Petro Poroshenko warns new Cold War is looming', www.theage.com.au/federal-politics/political-news/ukrainian-president-petro-poroshenko-warns-new-cold-war-is-looming-20141212-12636m.html

APPENDIX: NUCLEAR SAFEGUARDS

This appendix discusses a range of problems associated with safeguards and Australia's uranium export policies under the following headings:
– The limitations of safeguards − summary
– Australia's uranium export policy / customer countries
– Provisions in bilateral agreements − enrichment and reprocessing
– Not all facilities processing AONM are subject to IAEA inspections
– Australia's uranium exports are shrouded in secrecy
– Safeguards and Australia's uranium exports − uranium sales to India
– Safeguards and Australia's uranium exports − uranium sales to Russia
– The Australian Safeguards and Non-Proliferation Office (ASNO)
– The realpolitik of Australian safeguards policy

The limitations of safeguards − summary

There are many problems and limitations with the international safeguards system. In articles and speeches during his tenure as IAEA Director General from 1997− 2009, Dr. Mohamed El Baradei said that the Agency's basic rights of inspection are "fairly limited", that the safeguards system suffers from "vulnerabilities" and "clearly needs reinforcement", that efforts to improve the system have been "half-hearted", and that the safeguards system operates on a "shoestring budget ... comparable to that of a local police department".

Problems with safeguards include:

1. Chronic under-resourcing.[69] Mohamed El Baradei told the IAEA Board of Governors in 2009: "I would be misleading world public opinion to create an impression that we are doing what we are supposed to do, when we know that we don't have the money to do it."[70] Little has changed since 2009. Meanwhile, the scale of the safeguards challenge is ever-increasing as new facilities are built and materials stockpiles grow.

2. Issues relating to national sovereignty and commercial confidentiality adversely impact on safeguards.

3. The inevitability of accounting discrepancies. Nuclear accounting discrepancies are commonplace and inevitable due to the difficulty of precisely measuring nuclear materials. The accounting discrepancies are known as Material Unaccounted For (MUF). There have been incidents of large-scale MUF in Australia's uranium customer countries such as the UK and Japan.[71]

4. Incorrect/outdated assumptions about the amount of fissile material required to build a weapon.

5. The fact that the IAEA has no mandate to prevent the misuse of civil nuclear facilities and materials − at best it can detect misuse/diversion and refer the problem to the UN Security Council. As the IAEA states: "It is clear that no international safeguards system can physically prevent diversion or the setting up of an undeclared or clandestine nuclear programme."[72] Numerous examples illustrate how difficult and protracted

[69] See section 6 in: 'The Nuclear Safeguards System: An Illusion of Protection', 2010, www.choosenuclearfree.net/safeguards/
[70] Mohamed El Baradei, 16 June 2009, 'Director General's Intervention on Budget at IAEA Board of Governors', www.iaea.org/newscenter/statements/director-generals-intervention-budget-iaea-board-governors
[71] See section 4 in: 'The Nuclear Safeguards System: An Illusion of Protection', 2010, www.choosenuclearfree.net/safeguards/
[72] IAEA, 1993, Against the Spread of Nuclear Weapons: IAEA Safeguards in the 1990s.

the resolution (or attempted resolution) of such issues can be, e.g. North Korea, Iran, Iraq in the 1970s and again in the early 1990s. Countries that have breached their safeguards obligations can simply withdraw from the NPT and pursue a weapons program, as North Korea has done.

6. Safeguards are shrouded in secrecy − to give one example, the IAEA used to publish aggregate data on the number of inspections in India, Israel and Pakistan, but even that nearly worthless information is no longer publicly available.

7. There are precedents for the complete breakdown of nuclear safeguards in the context of political and military conflict − examples include Iraq, Yugoslavia and several African countries.

8. Currently, IAEA safeguards only begin at the stage of uranium enrichment. Application of IAEA safeguards should be extended to fully apply to mined uranium ores, to refined uranium oxides, to uranium hexafluoride gas, and to uranium conversion facilities, as well as enrichment and subsequent stages of the nuclear fuel cycle. The Joint Standing Committee on Treaties (JSCOT) recommended in 2008 that "the Australian Government lobbies the IAEA and the five declared nuclear weapons states under the NPT to make the safeguarding of all conversion facilities mandatory."[73] However the Australian Government rejected the recommendation in its 2009 response to the JSCOT report.[74]

9. There is no resolution in sight to some of the most fundamental problems with safeguards such as countries invoking their right to pull out of the Nuclear Non-Proliferation Treaty (NPT) and developing a weapons capability as North Korea has done. More generally, responses to suspected non-compliance with safeguards agreements have been highly variable, ranging from inaction to economic sanctions to UN Security Council-mandated decommissioning programmes. Some states prefer to take matters into their own hands: e.g. Israel bombed and destroyed a research reactor in Iraq in 1981, the US bombed and destroyed a reactor in Iraq in 1991 and Israel bombed and destroyed a suspected reactor site in Syria in 2007.

In 1982, Mike Rann (later to become the South Australian Premier) identified the core problem: "Again and again, it has been demonstrated here and overseas that when problems over safeguards prove difficult, commercial considerations will come first."[75]

For more information on the limitations of safeguards, see:

Medical Association for the Prevention of War and Australian Conservation Foundation, 2006, "An Illusion of Protection: The Unavoidable Limitations of Safeguards", www.mapw.org.au/download/illusion-protection-acf-mapw-2006

Henry Sokolski (ed.), Feb 2008, "Falling Behind: International Scrutiny of the Peaceful Atom", www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=841

Alan J. Kuperman, David Sokolow, and Edwin S. Lyman, March 18, 2014, 'Can the IAEA Safeguard Fuel-Cycle Facilities?', Nuclear Proliferation Prevention Project, LBJ School of Public Affairs, University of Texas at Austin (www.NPPP.org), http://blogs.utexas.edu/nppp/files/2014/03/NPPP-working-paper-2-2014-Mar-18.pdf

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[73] Joint Standing Committee on Treaties, 2008, 'Report 94: Review into Treaties tabled on 14 May 2008', www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/report1/fullreport.pdf

[74] Australian Government, 2009, 'Government Response to Report 94 of the Joint Standing Committee on Treaties: Australia-Russia Nuclear Cooperation Agreement'

[75] Mike Rann, March 1982, 'Uranium: Play It Safe'.

Looking beyond Iran and North Korea for Safeguarding the Foundations of Nuclear Nonproliferation, former IAEA Safeguards Director Pierre Goldschmidt, Nov 15, 2011, www.npolicy.org/article.php?aid=1115&tid=4

Building Support for the Agency's Safeguards Mission, Henry Sokolski, Nov 03, 2010, Nonproliferation Policy Education Centre, www.npolicy.org/article.php?aid=50&rtid=6

Non-proliferation Policy Education Centre www.npolicy.org and see in particular the section on the non-proliferation regime www.npolicy.org/topics.php?page=0&tid=4

Nuclear Power Joint Fact Finding Dialogue, June 2007, https://www.keystone.org/policy-initiatives-center-for-science-a-public-policy/energy/nuclear-power-joint-fact-finding.html

Value-subtracting: Form vs. substance in Australian uranium safeguard policy, Richard Leaver, Austral Special Report 09-08S, 11 December 2009, Nautilus Institute, http://nautilus.wpengine.netdna-cdn.com/wp-content/uploads/2012/02/leaver-safeguards.pdf

Nuclear Safeguards: some Canadian questions about Australian policy, Richard Leaver, Austral Policy Forum 09-5A, 23 February 2009, http://nautilus.org/apsnet/nuclear-safeguards-some-canadian-questions-about-australian-policy/

The Nuclear Safeguards System: An Illusion of Protection, 2010, www.choosenuclearfree.net/safeguards/

Australia's uranium export policy / customer countries

Here brief comment is made about the choice of uranium customer countries. In 1998, the then Director-General of the Australian Safeguards and Non-proliferation office (ASNO) said: "One of the features of Australian policy ... is very careful selection of our treaty partners. We have concluded bilateral arrangements only with countries whose credentials are impeccable in this area."[76]

That was not true at the time (e.g. sales to declared nuclear weapons states that pay scant regard to their NPT obligations) and it is certainly not true now. Australia has uranium sales agreements with:
– repressive, secretive countries (e.g. China and Russia − albeit the case that sales to Russia have been suspended)
– nuclear weapons states that are not fulfilling their disarmament obligations under the Nuclear Non-Proliferation Treaty (US, Russia, China, France, UK)
– countries that have not ratified the Comprehensive Test Ban Treaty (China, USA, India)
– countries with a history of weapons-related research based on their civil nuclear programs (South Korea[77] and Taiwan).

Provisions in bilateral agreements − enrichment and reprocessing

[76] John Carlson, 1998, http://web.archive.org/web/20040217071924/http://www.aph.gov.au/hansard/joint/commttee/j2022.pdf, p.15

[77] South Korea is a major customer of Australian uranium with less-than-impeccable credentials. In 2004, South Korea disclosed information about a range of activities which violated its NPT commitments – uranium enrichment from 1979-81, the separation of small quantities of plutonium in 1982, uranium enrichment experiments in 2000, and the production of depleted uranium munitions from 1983-1987. Australia has supplied South Korea with uranium since 1986. It is not known – and may never be known – whether Australian-obligated nuclear materials were used in any of the illicit research.

In addition to IAEA safeguards, countries purchasing Australian uranium must sign a bilateral agreement. However there are no Australian inspections of nuclear materials stockpiles or facilities using Australian Obligated Nuclear Materials (AONM − primarily uranium and its by-products such as plutonium) – Australia is entirely reliant on the inadequate and underfunded inspection system of the IAEA.

The most important provisions in bilateral agreements are for prior Australian consent before Australian nuclear material is transferred to a third party, enriched beyond 20% uranium-235, or reprocessed. However no Australian government has ever refused permission to separate plutonium from spent fuel via reprocessing (and there has never been a request to enrich beyond 20% U-235). Even when reprocessing leads to the stockpiling of plutonium (which can be used directly in nuclear weapons), ongoing or 'programmatic' permission has been granted by Australian governments. Hence there are stockpiles of Australian-obligated separated plutonium in Japan and in some European countries.

Japan, a major customer of Australian uranium, has a nuclear 'threshold' or 'breakout' capability − it could produce nuclear weapons within months of a decision to do so, relying heavily on facilities, materials and expertise from its civil nuclear program. An obvious source of fissile material for a weapons program in Japan would be its stockpile of plutonium − including Australian-obligated plutonium. In April 2002, the then leader of Japan's Liberal Party, Ichiro Ozawa, said Japan should consider building nuclear weapons to counter China and suggested a source of fissile material: "It would be so easy for us to produce nuclear warheads; we have plutonium at nuclear power plants in Japan, enough to make several thousand such warheads."

Japan's plutonium program increases regional tensions and proliferation risks. Diplomatic cables in 1993 and 1994 from US Ambassadors in Tokyo describe Japan's accumulation of plutonium as "massive" and questioned the rationale for the stockpiling of so much plutonium since it appeared to be economically unjustified.[78] A March 1993 diplomatic cable from US Ambassador Armacost in Tokyo to Secretary of State Warren Christopher, obtained under the US Freedom of Information Act, posed these questions: "Can Japan expect that if it embarks on a massive plutonium recycling program that Korea and other nations would not press ahead with reprocessing programs? Would not the perception of Japan's being awash in plutonium and possessing leading edge rocket technology create anxiety in the region?"[79]

Japan's plutonium stockpiling and reprocessing plans continue to cause regional concern − for example China has recently voiced concern.[80] Moreover it continues to complicate efforts to prevent other regional countries (esp. South Korea) from going down the same plutonium/reprocessing path.

Despite this, Australia continues to provide open-ended ('programmatic') approval for Japan to separate Australian-obligated plutonium. The government could and should prohibit the stockpiling of Australian-obligated plutonium. At the very least, the government should revert to the previous Australian policy of requiring approval for plutonium separation / reprocessing on a case-by-case basis.

It is frequently claimed that the "strict" or "stringent" conditions placed on AONM encourage a strengthening of non-proliferation measures generally. However, by permitting the stockpiling of plutonium the Australian government is not 'raising the bar' but is setting a poor example and encouraging other uranium exporters to adopt or persist with equally irresponsible policies. While the Australian government

[78] http://web.archive.org/web/20081114064230/http://archive.greenpeace.org/pressreleases/nuctrans/1999sep1.html
[79] http://web.archive.org/web/20081114064230/http://archive.greenpeace.org/pressreleases/nuctrans/1999sep1.html
[80] Jonathan Tirone and Jacob Adelman, 24 March 2014, 'Japan's Plutonium Plans Stoke China Tensions on A-Bomb Risk', www.bloomberg.com/news/2014-03-23/japan-s-plutonium-potential-stokes-china-tensions-on-a-bomb-risk.html

does not have the authority to prohibit stockpiling, it does have the authority to permit transfers and reprocessing of AONM and could therefore put an end to the stockpiling of Australian-obligated plutonium.

Not all facilities processing AONM are subject to IAEA inspections

Australia allows the processing of AONM in facilities which are not covered by IAEA safeguards at all. While AONM is meant to be subject to IAEA safeguards from the enrichment stage onwards, ASNO is willing to make exceptions.

For example, ASNO has recommended that the Australian government agree to the processing of Australian uranium in unsafeguarded enrichment plants in Russia and the recommendation was readily accepted by the federal government. ASNO states: "Russia does not propose to place these enrichment facilities on its Eligible Facilities List because the facilities were never designed for the application of safeguards and could not be readily adapted for safeguards purposes."[81]

The enrichment facilities would not require any adaptation whatsoever. Russia simply needs to permit the application of safeguards and the IAEA could then adopt safeguards measures such as inspections, the use of video monitoring etc.

Australia's uranium exports are shrouded in secrecy

Nuclear transfers and developments demand the highest level of transparency; however this is often not the case. Some examples of unjustified secrecy include the refusal of successive Australian governments to publicly release:

1. Country-by-country information on the separation and stockpiling of Australian-obligated plutonium.

2. 'Administrative Arrangements' which contain vital information about the safeguards arrangements required by Australia.

3. Information on nuclear accounting discrepancies (Material Unaccounted For) including the volumes of nuclear materials, the countries involved, and the reasons given to explain these accounting discrepancies. The JSCOT has previously recommended that: "Further consideration is given to the justification for secrecy of 'Material Unaccounted For'."[82] There is no legitimate justification for the secrecy surrounding MUF. ASNO has done no better than to cite commercial confidentiality.[83] All MUF information, past, present and future, should be reported publicly and this should be done on a country-by-country and facility-by-facility basis. Some other countries (e.g. Japan) release MUF data and thus Australia's secrecy clearly fails to meet best practice.

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[81] ASNO, 2008, Answer 'DD' in response to Questions on Notice to ASNO, Question 20, Output 1.1.10, October 2008 session of Senate Estimates, questions by Senator Ludlam.

[82] Joint Standing Committee on Treaties, 2008, 'Report 94: Review into Treaties tabled on 14 May 2008', List of Recommendations, www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/report1/fullreport.pdf

[83] www.aph.gov.au/parliamentary_business/committees/house_of_representatives_committees?url=jsct/14may2008/subs/sub22_1.pdf

4. The quantities of AONM held in each country are confidential. ASNO states: "The actual quantities of AONM held in each country, and accounted for by that country pursuant to the relevant agreement with Australia, are considered by ASNO's counterparts to be confidential information."[84]

The following information should be public released: country-by-country information on the separation and stockpiling of Australian-obligated plutonium; all current and future 'Administrative Arrangements' pertaining to uranium exports; detailed information on nuclear accounting discrepancies including the volumes of nuclear materials, the countries involved, and the reasons given to explain accounting discrepancies; and the quantities of Australian Obligated Nuclear Materials held in each country.

Safeguards and Australia's uranium exports − uranium sales to India

Despite the best efforts of JSCOT and others, the Australian government severely compromised the safeguards system by pursuing a nuclear cooperation agreement with India that weakens safeguards standards in many respects. The agreement was strongly opposed by, among others, a former Director-General of the Australian Safeguards and Non-Proliferation Office (John Carlson), a former Chair of the Board of Governors of the International Atomic Energy Agency (Ronald Walker), a former Assistant Director of the US Arms Control and Disarmament Agency (Prof. Lawrence Scheinman), and an Australian nuclear arms control expert (Crispin Rovere).[85]

John Carlson, who headed Australia's safeguards office for 21 years, argued that the agreement with India "represents a serious weakening of Australia's ... safeguards conditions" and that weaknesses in the agreement "mean Australian material could be used in support of India's nuclear weapon program."[86]

John Carlson noted in a submission to JSCOT that the agreement potentially sets a poor precedent with wider, adverse consequences: "If the Government does compromise Australia's safeguards conditions, inevitably this will lead to other agreement partners asking for similar treatment."[87]

Moreover, other nuclear and uranium exporting countries will follow Australia's lead and weaken their safeguards requirements. This disturbing and cascading retreat from responsibility would further compromise non-proliferation objectives and mechanisms. Again, these concerns are raised by non-proliferation experts in submissions to JSCOT.

Uranium sales should not be permitted to countries that have not signed the Non-Proliferation Treaty or the Comprehensive Test Ban Treaty and are actively expanding their nuclear weapons arsenals (e.g. India).

Safeguards and Australia's uranium exports − uranium sales to Russia

Submissions to the JSCOT India inquiry by John Carlson and some others argued that Australia's safeguards requirements were robust other than the seriously defective Australia−India Nuclear Cooperation Agreement.

[84] ASNO − Australian Safeguards and Non-proliferation Office, 2001-02, Annual Report, www.asno.dfat.gov.au/annual_report_0102/asno_annual_report_2001_2002.pdf
[85] See their submissions to the JSCOT: www.aph.gov.au/Parliamentary_Business/Committees/Joint/Treaties/28_October_2014/Submissions
[86] www.aph.gov.au/DocumentStore.ashx?id=35fb7f72-904c-4d44-b387-f34e4afb77f9&subId=301365
[87] www.aph.gov.au/DocumentStore.ashx?id=79a1a29e-5691-4299-8923-06e633780d4b&subId=301365

Those arguments do not stand up to scrutiny, and there is no clearer illustration of profound problems than the Australia−Russia Nuclear Cooperation Agreement.[88] The JSCOT rejected[89] the agreement to sell uranium to Russia when it learnt that IAEA safeguards inspections in Russia are nearly non-existent. Among other recommendations the JSCOT said it is "essential that actual physical inspection by the IAEA occurs at any Russian sites that may handle" Australian uranium and that uranium exports "should be contingent upon such inspections being carried out." The major parties in Canberra rejected the recommendation − they were prepared to allow uranium sales to Russia despite being well aware that IAEA safeguards inspections are very nearly non-existent.

ASNO failed to advise the JSCOT that safeguards inspections in Russia are very nearly non-existent − until that information was provided to the JSCOT by an NGO. In other words, ASNO misled the JSCOT and thereby misled Parliament. Further, ASNO's submission to the JSCOT inquiry into uranium sales to Russia said that Australia exports uranium under "strict non-proliferation conditions." The reality of near-zero safeguards inspections cannot be squared with the claimed of strict conditions.

Likewise, ASNO's 'Regulation Impact Statement' stated: "These agreements establish strict safeguards and control measures to ensure that exported uranium, nuclear equipment, or technology, are used solely for peaceful, non-military purposes." That claim cannot be squared with the reality of nearly non-existent safeguards inspections in Russia.

The Australian Safeguards and Non-Proliferation Office (ASNO)

A 2007 EnergyScience Coalition paper detailed many problems with ASNO. The paper concluded:[90]

"The authors of this paper believe there is a compelling case for major reform of ASNO as a matter of urgency. An alternative course of action would be for the Australian government to establish an independent public inquiry. Such an inquiry should have a broad mandate to review all aspects of ASNO's structure and function, should be adequately resourced, and should have powers similar to those of a Royal Commission to access witnesses, documents and other evidence.

"Such an inquiry should be carried out independently of ASNO. It should also be carried out independently of the Department of Foreign Affairs and Trade (DFAT), given that the current relationship between ASNO and DFAT is arguably one of the areas in need of review. DFAT has declined a request to review a paper detailing numerous inaccurate statements made by ASNO (letter to NGOs, 28 May 2007, available on request).

"Such an inquiry should address the competence and performance of ASNO; its scientific and technical expertise; whether its current management, organisation, structure and relationships best serve its mandate; any conflicts of interest; the implications of ASNO's structural connection to DFAT (whether it has sufficient independence or operates as a 'captured bureaucracy'); and options for reform including consideration of organisational models in other countries."

[88] www.foe.org.au/anti-nuclear/issues/oz/u/cc#russia

[89] www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=/jsct/14may2008/report1/fullreport.pdf

[90] EnergyScience Coalition, 2007, 'Who's Watching the Nuclear Watchdog - A Critique of the Australian Safeguards and Non-Proliferation Office', www.energyscience.org.au/BP19%20ASNO.pdf

Since the 2007 paper was written, ASNO's performance has become even more problematic, e.g. misleading the JSCOT regarding safeguards in Russia, e.g. ASNO's defence of the indefensible Australia−India Nuclear Cooperation Agreement.

The following 2007 article summarises some of ASNO's failings:

> *Who's watching the nuclear watchdog?*
> *Richard Broinowski and Tilman Ruff*
> *Online Opinion*
> *10 September 2007*
> *www.onlineopinion.com.au/view.asp?article=6339*
> *Australia has been poorly served by the Australian Safeguards and Non-Proliferation Office, the Commonwealth agency tasked with preventing nuclear proliferation dangers associated with Australia's uranium exports. Its failures are so numerous and significant that, along with other members of the EnergyScience Coalition, we have written a comprehensive critique of the Office and call on the federal government to establish an independent public inquiry.*
> *The Safeguards Office makes the absurd claim that Australia only sells uranium to countries with "impeccable" non-proliferation credentials. In fact, Australia has uranium export agreements with nuclear weapon states (all of which are failing to fulfill their disarmament obligations under the Non-Proliferation Treaty) as well as with states with a history of covert nuclear weapons research based on their "civil" nuclear programs (such as South Korea and Taiwan).*
> *The government also permits - and the Safeguards Office supports - uranium sales to countries (including the United States) which are blocking progress on the Comprehensive Test Ban Treaty and the proposed Fissile Material Cut-Off Treaty.*
> *Now the government proposes allowing uranium sales to India, not even a signatory to the Non-Proliferation Treaty. This is a serious blow to the international non-proliferation regime yet has been met with silence from the Safeguards Office.*
> *Last year's debate on uranium sales to China showed the Safeguards Office at its worst. In testimony to the Joint Standing Committee on Treaties, the Office did not know the number of nuclear facilities in China, nor how many or which of these would process uranium and its by-products. Nor did it know how the International Atomic Energy Agency (IAEA) selected nuclear facilities for inspection. The Safeguards Office was dismissive of China having the worst record of exports of proliferation-sensitive materials and know-how of any of the nuclear weapon states.*
> *The Safeguards Office routinely misleads us when it asserts that nuclear safeguards "ensure" or "provide assurances" that Australian uranium will not contribute to weapons proliferation. These assurances contrast with the frankness of Dr Mohamed El Baradei, head of the IAEA, who acknowledges that the international safeguards system suffers from "vulnerabilities", not least because it runs on a "shoe string budget", and that efforts to improve the system have been "half-hearted".*
> *The Safeguards Office claims that all nuclear materials derived from Australia's uranium exports are "fully accounted for". That claim is false. There are frequent accounting discrepancies involving Australia's nuclear exports. What the Safeguards Office means when it says that nuclear material is "fully accounted for" is that it has accepted all the explanations provided by uranium customer countries for accounting discrepancies, however fanciful those explanations may be. Secrecy is another feature of the Safeguards Office - it refuses to provide specific or even aggregate data on nuclear accounting discrepancies.*
> *Perhaps the most misleading of the claims made by the Safeguards Office is its repeated assertion that nuclear power does not present a weapons proliferation risk. In fact, power reactors have been used directly in weapons programs. Some examples include India, which is reserving eight out of 22 power reactors for weapons production; the use of a power reactor in the United States to produce*

tritium, used to boost the yield of nuclear weapons; and North Korea's use of an "Experimental Power Reactor" to produce plutonium for weapons.
Nuclear power programs also indirectly facilitate weapons programs by providing a rationale for acquiring proliferative technologies such as research reactors, uranium enrichment plants and reprocessing plants.
The IAEA, the US Department of Energy and other authorities consider almost all plutonium to be weapons-usable, yet the Safeguards Office continues to claim that plutonium derived from power reactors is not suitable for weapons. This is not only wrong; it is dangerous.
The inevitable conclusion arising from our detailed critique of the Safeguards Office (posted at www.energyscience.org.au) is that, at best, it is ineffectual, providing an illusion that an independent agency is protecting the interests of the Australian people when it comes to the vital matter of preventing nuclear proliferation. At worst, the Safeguards Office serves the commercial interests of the nuclear industry and the political interests of those who promote it, and contributes more to the problem of nuclear weapons proliferation than to the solutions.
We call on the federal government to establish an independent public inquiry to review all aspects of the Safeguards Office - its performance; scientific and technical expertise; whether its current management, organisation and relationships best serve its mandate; any conflicts of interest; whether it has sufficient independence; and options for reform. The inquiry should be adequately resourced, and should have powers similar to those of a Royal Commission to access witnesses, documents and other evidence.

For more information on ASNO see:
www.foe.org.au/anti-nuclear/issues/oz/u/safeguards/asno

The *realpolitik* of Australian safeguards policy

It is sometimes claimed that Australia's safeguards requirements are the equal of or better than those applied by any other uranium-exporting country. However the IAEA is responsible for safeguards regardless of the origin of uranium supplies. And there are serious flaws with Australia's safeguards policies:

- Australia can claim little or no credit for the provisions of bilateral agreements given that key provisions have never been invoked (high enrichment), or, in the case of plutonium separation/stockpiling, permission has never been denied.
- In some cases Australia allows AONM to be processed in non-safeguards-eligible facilities.
- Australia allows uranium sales to nuclear weapons states which show little inclination to abide by their NPT disarmament obligations; states with a history of weapons-related research based on their civil nuclear programs; states blocking progress on the Comprehensive Test Ban Treaty and the proposed Fissile Material Cut-Off Treaty; and to undemocratic, repressive, secretive states with extensive and documented human rights abuses.
- Uranium exports are shrouded in secrecy at many levels.
- ASNO is in great need of radical reform, or abolition and replacement with a more credible safeguards agency.

Australia could use its status as the world's largest holder of uranium reserves to leverage non-proliferation and disarmament outcomes. Australia could, for example, have promoted the adoption of 'Additional Protocols', strengthened safeguards agreements which provide the IAEA with greater authority to inspect suspected diversion of nuclear materials. Australia could have led by insisting that all of Australia's uranium customer countries must have an Additional Protocol in place. Indeed Australia does now require Additional Protocols of all customer countries − but that policy was only adopted *after* all of Australia's customer countries had already concluded an Additional Protocol with no prompting or persuasion from Australia.

Repeatedly Australia has demonstrated a reluctance to actively advance and strengthen non-proliferation initiatives.

ASNO states: "The non-proliferation regime is also strengthened through Australia's requirement that recipients of Australian obligated nuclear material adhere to the Additional Protocol." But Australia had nothing at all to do with that strengthening of the safeguards system. Instead of using Australia's position to leverage a positive outcome, Australia indulged in a cynical, retrospective PR exercise in relation to Additional Protocols.