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Department of Foreign Affairs and Trade
Australian Safeguards and Non-Proliferation Office

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The Hon Richard Marles MP
Chair
Joint Standing Committee on Treaties
Parliament House
CANBERRA ACT 2600

Dear Chair

On Monday 17 June 2013, the Director General of the Australian Safeguards and Non-Proliferation Office (ASNO) with colleagues from the Department of Foreign Affairs and Trade (DFAT), Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), Department of Resources, Energy and Tourism (DRET), and the Australian Nuclear Science and Technology Organisation (ANSTO), appeared before the Joint Standing Committee on Treaties in relation to the proposed Australia-United Arab Emirates nuclear cooperation agreement. Following the hearing the Committee sent a list of 29 questions on notice on 25 June, asking for a response within seven business days. Attached are the responses to these questions.

Yours sincerely

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Assistant Secretary

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1. **Has the Department received or sought any industry or agency response to the application of a user-pays/supplier- supports approach to enhancing the nuclear safeguards and monitoring capacity of the IAEA - particularly through the use of a dedicated levy on uranium producers?**
2. **What has been the nature of any responses?**
3. **Is the Department aware of any comparable contribution models that might be apply in other sectors?**

   All Australian uranium producers are subject to the Uranium Producers Charge imposed by the *Nuclear Safeguards (Producers of Uranium Ore Concentrates) Charge Act 1993*. The charge, payable to consolidated revenue, is set in the Nuclear Non-Proliferation (Safeguards) Regulations 1987, and is currently 10.3077 cents per kilogram of uranium in the uranium ore concentrates produced by each uranium producer in the previous financial year. For the financial year 2011-12 the total amount levied across all four uranium producers was $616,757. The Australian Safeguards and Non-Proliferation Office (ASNO) is responsible for the implementation of the Uranium Producers Charge, and reports the charge rate and charge levied in its Annual Report.

   ASNO, DFAT and the Department of Resources, Energy and Tourism have not explored any other levy models that may be used in other sectors.

4. **Given that the commercial considerations of Australian uranium producers have been explicitly identified as a driver of this treaty action what mechanisms have been used to explore the extent and wider impact and benefit of these?**

   The extent of the potential supply of Australian uranium under this agreement is a commercial matter for the UAE and Australian uranium producers. Australian uranium producers and the Australian Uranium Association have stated that the settlement of bilateral nuclear cooperation agreements, such as the proposed agreement with the UAE, provide greater market access and flexibility as production increases.

5. **Has the Department received any industry or agency response in relation to the economic critique of the uranium sector contained in the Yellowcake Fever report? (Appendix 1 of the ACF submission)**

   Appendix 1 of the ACF's Yellowcake Fever report provides data on Australian uranium export and revenue for the past ten years. The figures appear to be broadly accurate and based on World Nuclear Association data. The Department of Resources, Energy and Tourism has not thoroughly analysed the report, nor has it received any industry or agency communication in relation to this data. ASNO and DFAT have not analysed this report.

6. **In the context of addressing the recommendations of the United Nations system-wide study on the implications of the accident at the Fukushima Daiichi nuclear power plant – September 2011- what information has been provided to the Department on the UN review process?**

   The UN-wide study mentions issues in relation to uranium mining that are covered or currently being addressed by Australian jurisdictions through establishment of a nationally uniform system of Codes and Guidance. The Australian Radiation Protection and Nuclear Safety Agency

(ARPANSA) promotes national uniformity, informed by international best practice, through the Radiation Health Committee, consisting of regulators from all Australian jurisdictions.

7. **What advice has been given or action taken by the Australian government or its agencies or by Australian uranium producers to give effect to the clear recommendation for a domestic in-depth assessment of the net cost impact of the impacts of mining fissionable material on local communities and ecosystems?**

   The Department of Resources, Energy and Tourism has not undertaken any specific action in relation to this report. The impact of uranium mining on communities and ecosystems is monitored by relevant Australian jurisdictions and the Department of Sustainability, Environment, Water, Population and Communities for matters of National Environmental Significance.

8. **It is proposed this treaty action 'shall remain in force for an initial period of thirty years and upon expiry of this initial period shall be renewed automatically for successive thirty year periods'. Some maintain that such a carte-blanche approach is inconsistent with the advancing the best non-proliferation and nuclear safety outcomes. Does the Department believe that this proposed treaty approach is consistent with best practise, especially given the growing consensus that best practise necessitates a commitment to practice continual improvement and observance of leading transparency and consultation methods?**

   Australia's bilateral nuclear cooperation agreements give effect to the conditions in Australia's policy for the supply of uranium for peaceful uses through providing a framework for supply. This framework includes accountability and transparency on the use of Australian obligated nuclear material (AONM) through the provision of reports to ASNO (required by an administrative arrangement established pursuant to Article XIII of this proposed Agreement) and consultation on the effective implementation of the Agreement (Article XIV in this proposed Agreement). Australia's other agreements either remain in force indefinitely unless the parties otherwise agree, or contain similar provisions for the extension of the agreement after thirty years have expired.

   These provisions are also standard features in the agreements of other uranium suppliers and represent international practice in bilateral nuclear safeguard agreements. Australia's bilateral nuclear cooperation agreements, including this proposed Agreement with the UAE, encourage Australia and a bilateral partner to consult on the effective implementation of the agreement; a vehicle through which changes in accountability and transparency can be made. ASNO consults with the competent safeguards implementation authorities with jurisdiction in Australia's major uranium trading partner countries approximately once per year for detailed discussions on the implementation of bilateral agreements.

9. **Given the widespread recognition of the proliferation dangers inherent in plutonium stockpiles, what is DFAT's justification for not stipulating a ban on reprocessing in all circumstances?**

   Reprocessing is the chemical processing of spent nuclear fuel to separate waste fission products from reusable plutonium and uranium. The reprocessing stage of the civilian nuclear fuel cycle is used in a limited number of countries as an alternative to permanent disposal of spent fuel. The principal advantages of reprocessing are that the volume of unusable radioactive material (e.g. waste) is reduced, and the uranium and plutonium are recovered for re-use in reactors for

electricity generation (so more energy is extracted from the original fuel). Reprocessing is a sensitive fuel cycle technology requiring robust safeguards and security measures.

Australia has provided reprocessing consent to a limited number of bilateral nuclear cooperation partners, France, UK and Japan[1], in accordance with Australia's policy on reprocessing of AONM released in 1980[2] and subsequently considered in the 1983-84 review of Australia's role in the nuclear fuel cycle[3]. The consent given to these countries was on the basis of Australia being satisfied with the commitments these countries had made in relation to safeguards, security and accountability, meeting Australia's policy requirements. Spent nuclear fuel containing AONM can only be reprocessed in countries to which Australia has given consent. To include in this proposed Agreement a prohibition on UAE doing so would be to constrain reprocessing in the countries with which Australia has already given consent for such activities, and would deny UAE the option of significantly reducing its radioactive waste volumes.

10. How does the Department believe that the rapid pace of political change and unrest in the Middle East and the very uncertain future for the region politically influence Australia's wish to promote nuclear power in the region?

Australia respects the sovereign decision of countries to choose their own mix of technologies for electricity supply providing it is in accordance with international requirements. Australia is in the position to supply uranium for civil nuclear power use for countries that choose to make nuclear part of their energy mix, and does so in accordance with strict conditions given effect in bilateral nuclear cooperation agreements.

Australia's decision to enter into a nuclear cooperation agreement with the UAE enabling the supply of Australian uranium to support its civil nuclear power industry, reflects our confidence in the UAE's capacity and willingness to comply fully with the stringent nuclear safeguards, security and transparency conditions set out in the proposed Agreement.

11. Can ASNO confirm that nothing in the Australia-UAE Agreement, or in any other bilateral or international agreement to which the UAE is a party, precludes the stockpiling of separated or unirradiated plutonium in the UAE?

12. If so, does that not seriously undermine whatever non-proliferation benefits arise from prohibitions on domestic enrichment and reprocessing in the UAE?

We cannot foresee a plausible operational requirement whereby the UAE would need to receive and stockpile unirradiated plutonium in separated form. One scenario for fuelling its reactors that might potentially be open to the UAE in the future is using a mixed uranium-plutonium oxide fuel, known as MOX. We are not aware of UAE's long term plans in this regard but it is an option that a small number of countries have taken. Plutonium in fresh MOX fuel is categorised as unirradiated plutonium, but importantly it is encapsulated in an oxide mixture within the fuel element. Once fed into a reactor the plutonium becomes irradiated, thereby significantly reducing the levels of safeguards and security controls required.

The UAE's nuclear energy policy explicitly rules out reprocessing nuclear fuel in the UAE, and it has reinforced this by a national law prohibiting this activity. This decision supports long-

[1] Consent has also been granted to Switzerland and Sweden but not used as these countries have not established reprocessing programs.
[2] House of Representatives Hansard, 27 November 1980.
[3] *Australia's Role in the Nuclear Fuel Cycle, a report to the Prime Minister by the Australian Science and Technology Council (ASTEC)*, May 1984.

standing international efforts to limit the spread of, and access to, sensitive nuclear technologies related to reprocessing and enrichment. If the UAE were to opt to use MOX fuel in the future this would not undermine the benefits that derive from the responsible decision the UAE has made to forego access to this technology.

To manage the spent fuel from its nuclear reactors the UAE therefore has essentially two long-term options: (1) construct a facility for the long-term or permanent disposal of spent nuclear fuel elements; or (2) send the spent fuel to another country for reprocessing, whereby the uranium and plutonium would be separated from the remaining fission product waste, and develop a long-term disposal facility for this separated waste. If the UAE opts to use the reprocessing services in another country in the future, then it could potentially take the plutonium back in the form of manufactured MOX fuel as part of the arrangements it has with the reprocessing service provider. As noted above, we are not aware if UAE will use MOX fuel in the future, but this reinforces the importance of having consultation mechanisms in bilateral nuclear cooperation agreements (in the case of this proposed agreement, Article XIV) to discuss these sort of operational matters to ensure that appropriate safeguards and security apply.

13. Can DFAT/ASNO list all the military strikes and attempted military strikes on nuclear facilities in the Middle East since 1980?

Attacks on nuclear facilities in the Middle East are well reported in the public domain. The Osiraq nuclear reactor at Al Tuwaitha in Iraq was subject to military attacks by Iran in 1980 and Israel in 1981. The reactor was non-operational at the time of these attacks. During the 1990-1991 Persian Gulf War, coalition forces conducted military attacks on nuclear facilities in Iraq, including the ISIS and IRT-5000 reactors at Al Tuwaitha. In 2007 the non-operational Syrian nuclear reactor at Al-Kibar was destroyed reportedly by an Israeli military attack.

14. What effect on safeguards does DFAT/ASNO believe result from those military strikes and attempted military strikes?

With the exception of the three reactors at Al Tuwaitha in Iraq, the nuclear facilities that have been subject to military strike have been clandestine facilities not declared to the IAEA for the application of safeguards. The strikes on these facilities alerted the international community to their existence. The States that built these facilities were in breach of their obligations under their safeguards agreements with the IAEA. Such revelations prompted the IAEA to develop strengthened safeguards measures.

15. Do DFAT/ASNO intend that instances of Material Unaccounted For (MUF) in the UAE will be publicly reported or will they be kept secret?

16. If the intention is to keep that information secret, what is the justification for that secrecy?

17. Have DFAT/ASNO discussed the issue of MUF transparency/secrecy with UAE officials?

The term "material unaccounted for" (MUF) relates to the difference between recorded quantities and measured quantities of nuclear material, and is a normal occurrence in the verification of nuclear accounts when nuclear material is in bulk form and can be measured or weighed directly. It usually arises as a result of intrinsic tolerances in the measurement equipment or processes used. A more detailed explanation of MUF, and why information on MUF in foreign jurisdictions is not published by ASNO, was provided in the Government's response to recommendation 1.(g) in JSCOT report number 94, available at:

http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=jsct/governmentresponses/94th.pdf

In the case of UAE, as Australian obligated nuclear material (AONM) will be in the form of manufactured fuel elements we expect that MUF figures for AONM will be zero. Once nuclear material is manufactured into fuel elements precise measurements of the contained weight of uranium are not possible. As the uranium is completely encapsulated, fuel elements are accounted for as discrete items and MUF does not arise.

18. **Does ASNO accept that the ASNO estimate of $94 million in revenue on the assumption that Australia supplies UAE with 1000 t U3O8 annually assumes that Australia supplies all or nearly all of the uranium that would be required to fuel the four reactors planned in the UAE?**
    a. **Why does ASNO make such an implausible assumption?**

The Department of Resources, Energy and Tourism previously (13 May 2013) took on notice the following question by the Committee: 'What is the estimated impact on ... Australian export revenue ... if Australian uranium producers provide 100% of the UAE's anticipated uranium needs for all four reactors, estimated to be 1000 tonnes per year once the four reactors are operational?' The Department provided the $94 million figure based on the supply of this tonnage at the current spot price, and noted the assumptions of such a scenario in the answer provided.

19. **Can DFAT/ASNO provide any specific information, or aggregated non-country-specific information, on Material Unaccounted For (MUF) involving AONM?**
    a. **If not, what is the justification for that secrecy?**
20. **Are provisions for transparency/secrecy in relation to MUF contained in Administrative Arrangements (which are also to be kept secret) or elsewhere?**
21. **If commercial confidentiality is given to justify secrecy in relation to MUF, can ASNO/DFAT explain precisely how i) commercial interests could in any way be jeopardised by the release of MUF information and ii) why commercial interests should take primacy?**
22. **What steps have DFAT/ASNO taken in response to the recommendation in JSCT Report #94 that: "Further consideration is given to the justification for secrecy of Material Unaccounted For'"?**
23. **Do DFAT/ASNO accept the JSCT Report #94 view that "assurances of safety must override commercial interests" in relation to public reporting of MUF information?**

ASNO/DFAT's response to the question of publishing information on MUF in other countries was provided in the Government's response to the recommendation 1.(g) in JSCOT report #94 (see URL link in question 17), and no further action has been taken. As noted in that response, the question of publishing data on MUF in other countries is not a decision that can be made by Australia, but rather a decision for each bilateral partner. This is not specified in Administrative Arrangements but the details of nuclear inventory provided in bilateral reports have long been considered by bilateral partners to be confidential.

DFAT/ASNO accepts that safety is of primary importance however conclusions on safety cannot be drawn from the size of MUF in a particular process

24. Can DFAT/ASNO provide detailed country-by-country information on the separation and stockpiling of Australian-obligated plutonium?

25. If not, why not?

Bilateral partners consider information on irradiated and separated plutonium to be confidential. ASNO is not aware of another uranium supplier that publishes this level of detail. ASNO provides details in its annual report of the total amount of Australian-obligated plutonium in foreign jurisdictions, both in irradiated form and separated form, but does not provide country specific information (for example, see page 65 of the 2011-12 ASNO Annual Report available at: http://www.dfat.gov.au/asno/annual_report_1112/).

26. Can DFAT/ASNO release all Administrative Arrangements pertaining to AONM?

27. If not, why not?

Administrative Arrangements are considered confidential between the parties. At various times Australian officials have sought the agreement of bilateral partners to publish Administrative Arrangements but agreement has not been forthcoming. However, recognising that there is some public interest in the content of Administrative Arrangements, ASNO (then known as the Australian Safeguards Office (ASO)) published an overview in its 1993-94 Annual Report (copied below).

28. ASNO has previously stated that: "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." (ASNO Annual Report, 2001/02). Does each and every one of the countries holding AONM consider that information to be confidential? For example, does Japan consider that information to be confidential?

ASNO has sought the views of several bilateral partners in the past on the question of publishing country specific information on quantities of AONM held. Most bilateral partners confirmed that they considered the information on their respective holdings of AONM to be confidential. It would not be appropriate to repeat the views of individual countries.

ASNO provides details in its annual report of the total amount of Australian nuclear material in foreign jurisdictions for each category of nuclear material, in addition to information on transfers of nuclear material between jurisdictions (for example, see page 65 of the 2011-12 ASNO Annual Report available at: http://www.dfat.gov.au/asno/annual_report_1112/). ASNO is not aware of another uranium supplier that publishes this level of detail.

29. What is DFAT/ASNO's response to the recommendation in JSCT Report #94 that: "Further consideration is given to Article IX of the Agreements, 'State Secrets'" until the Government is confident that this article will not undermine the intent of this agreement?

The Government's response to this JSCOT recommendation is available at:

http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=jsct/governmentresponses/94th.pdf

There are no 'state secret' provisions in the proposed agreement with the UAE.

A GUIDE TO ADMINISTRATIVE ARRANGEMENTS

From Annual Report of the Director Safeguards, Australian Safeguards Office (ASO) 1993-04

Australia's bilateral safeguards agreements establish a framework through which ASO and its counterpart organisations may account for, and control the use of, uranium supplied by Australia, or subsequent generations of nuclear material derived from its use. Each agreement is supplemented by an Administrative Arrangement (AA). This is a confidential document of less than treaty status which describes the way in which the obligations contained in the bilateral agreement are to be fulfilled.

Depending on the scope of the relevant agreement, each AA applies to nuclear material, material, equipment and technology transferred between the two parties (some agreements cover only nuclear material). The requirements set out in an AA apply to both ASO and its counterpart organisation, and are designed to ensure the smooth transfer of material and/or equipment between the parties, and for its tracking within the recipient's fuel cycles. The purpose of such tracking is to ensure the conditions set out in Australia's bilateral agreements are adhered to.

AA procedures dovetail as much as possible with IAEA safeguards. To avoid duplication, the IAEA accounting system is used for the purposes of the AA. However, since the IAEA system does not identify material by country of origin (or safeguards obligation), the AA sets out procedures by which material coming under the agreement can be so identified.

Once Australian yellowcake has been converted into a useable form it becomes subject to IAEA safeguards. Inspection activities carried out by the IAEA provide assurance that the nuclear material is not diverted from peaceful uses.

Accounting and Control

The system of accountancy and control established by each AA enables the parties to account for Australian obligated nuclear material, "AONM", as it moves through the nuclear fuel cycle after export as yellowcake from Australia.

This identification is achieved by means of the principles of proportionality and equivalence which are based on the recognition that atoms or molecules of any substance are indistinguishable from one another, and that in industrial processes it is impracticable to keep atoms from a particular country separate from atoms from other countries. Using the proportionality principle, the recipient country will track AONM through its fuel cycle by attributing a quantity of (say) uranium hexafluoride (UF_6) as being AONM in the same proportion that the quantity of Australian yellowcake bore to the total amount of yellowcake used to produce the uranium hexafluoride. Mixing by the recipient country of Australian material with material of other origin does not result in "contamination" of all the material.

Processing losses are accounted for in the same way. If out of 10 tonnes of U_3O_8 used to make a quantity of UF_6, 5 tonnes is AONM, half the processing losses come from the Australian material and half the final quantity of UF_6 will be AONM.

The principle of equivalence ensures that it does not matter what part of the UF_6 in the above example is designated as AONM, provided that the proportionality principle continues to apply. The principle of equivalence does not allow substitution of lower quality material to be designated as the material subject to the agreement – e.g. a quantity of enriched uranium derived from AONM using the proportionality principle could not be replaced by natural or depleted uranium.

The application of these principles enables the ASO and its counterpart organisation to exchange regular reports so that each is able to account for all nuclear material subject to the agreement. These reports are based on records kept by ASO and its counterpart. The records start from an initial inventory of material transferred from one country to the other after a certain date (usually the date of entry into force of the agreement). The inventories and records are continually updated as further material arrives in, or leaves the country, or as it changes its form as it goes through the fuel cycle, and take into account all inventory increases and decreases.

Communications

When any nuclear material is to be shipped between Australia and its bilateral partner, communications have to be exchanged stating, amongst other things, the point at which the nuclear material will come under the terms of the agreement, the owner, its intended use and when responsibility for the purposes of the IAEA/NPT safeguards and responsibility for physical protection are transferred between the two parties. In most cases nuclear material transferred between Australia and its bilateral partner becomes subject to the agreement when it enters the latter's territory.

Before a recipient country can retransfer any AONM to a third country, it must seek Australia's prior consent. The AA specifies the information which must accompany the request so as to enable tracking of the AONM into third countries. The requests must specify, for example, the owner, form of the material, from whom it is being retransferred, the facility to which it is going in the third country, and the proposed use of the material.

Arrangements for material, equipment and technology

Where a bilateral safeguards agreement covers these matters, the AA provides for the ASO and its counterpart organisation to establish inventories of all material, equipment and technology subject to the agreement transferred between their two countries. They have to inform each other regularly of the location of the items, and of compliance with any conditions attaching thereto under the agreement. Any requests to retransfer will need to specify the same sort of information as applies to nuclear material.

Third party considerations (multi-labelling)

AONM sold to a customer automatically attracts conditions imposed by the bilateral safeguards agreement between Australia and the customer country. This AONM may also become subject to conditions contained in agreements or arrangements with third parties. For example, if AONM passes through the USA for conversion, enrichment or fabrication, it may attract conditions imposed by an agreement between the USA and the customer country. In these circumstances ASO and its counterpart in the customer country will consult. The consultations aim to simplify procedures required to ensure compliance with all conditions, without of course detracting from conditions under the Australian agreement.

Consultations

The ASO and its counterpart may consult on any matters connected with the implementation of the agreement or the AA, and the latter can be amended by mutual agreement between ASO and the counterpart.