Australian Government
Australian Safeguards and Non-Proliferation Office

Inquiry into the prerequisites for nuclear energy in Australia

Submission by Dr Robert Floyd, Director General, Australian Safeguards and Non-Proliferation Office addressing term of reference h: Security Implications

There are several key security implications associated with the possible operation of nuclear power reactors in Australia. These are the risks associated with nuclear sabotage and the unauthorised removal of nuclear material from facilities, and the implications of a domestic civil nuclear program for Australia's non-proliferation commitments under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The International Atomic Energy Agency (IAEA) has comprehensive webpages devoted to nuclear security and safety and safeguards, in addition to a general description of safeguards provided at overview of safeguards.

Australia's Current Arrangements

The Australian Safeguards and Non-Proliferation Office (ASNO), led by its statutorily appointed Director General, administers the *Nuclear Non-Proliferation (Safeguards) Act 1987* (Safeguards Act). The Safeguards Act gives effect to Australia's obligations under the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and related international agreements, the Amended Convention on the Physical Protection of Nuclear Material (ACPPNM) and the International Convention for the Suppression of Acts of Nuclear Terrorism. The Safeguards Act applies to all nuclear facilities and all nuclear material in Australia.

Under the Safeguards Act, ASNO regulates nuclear facilities, nuclear material and associated items to fulfil Australia's obligations under Australia's Safeguards Agreement and Additional Protocol with the IAEA, and to prevent acts of theft or sabotage. Permits and authorities granted by ASNO include conditions on accounting for, controlling and applying physical protection to nuclear material and associated items, in use, storage and transport. For facilities, the requirement to hold a permit from ASNO commences before work may be carried out to establish a facility and continues for the lifetime of that facility, until decommissioning is complete. To promote transparency, ASNO has established a number of template permits and associated compliance codes corresponding to different industry groups that currently operate in Australia. The Safeguards Act does not prohibit the granting of permits to establish or operate a nuclear power reactor.

Australia's nuclear security regulatory requirements are derived from the ACPPNM, the IAEA document INFCIRC/225/Rev.5, associated guidance contained in the Nuclear Security Series and information security requirements as contained in the Protective Security Policy Framework.

Australia has been rated highly in the Nuclear Security Index published by the Nuclear Threat Initiative since it was first released in 2012. The Index is a public benchmarking project of nuclear security conditions on a country-by-country basis. Australia's nuclear security arrangements were peer-reviewed in 2013 and 2017 by the IAEA-led International Physical Protection Advisory Service, with positive feedback provided and recommendations made as to how nuclear security might be further strengthened.

Managing Proliferation and Security Risks with Nuclear Power Reactors in Australia

Nuclear power reactors present a higher inherent security and proliferation risk than research reactors (such as ANSTO's OPAL reactor) due to their much higher inventory of nuclear material and the greater potential consequences from sabotage. However, nuclear power reactors have a relatively lower proliferation risk than the more sensitive stages of the fuel cycle, such as enrichment and reprocessing.

Constructing nuclear power reactors in Australia would increase the frequency of IAEA inspections and the volume of Australia's regular safeguards reporting to the IAEA, but not otherwise substantially affect the application of IAEA safeguards in Australia.

The current international nuclear security framework, including treaties (ACPPNM) and international best practice guidance documents (Nuclear Security Series), cover all types of nuclear facilities, from uranium mines to nuclear power reactors. While Australia is well versed with these international guidelines, ASNO has not established specific regulatory requirements (in legislation, regulations or permits) for nuclear power reactors. If Australia were to establish a civil nuclear energy program in the future, its domestic regulatory framework would need to be appropriately revised, and ASNO's regulatory capacity would need to be scaled up to meet the needs of an expansion in Australia's nuclear footprint. Australia would need to re-examine the local threat situation and formally review its Design Basis Threat, which informs the design of security systems in order to defeat potential adversaries. The IAEA has published a guide to assist States in establishing an effective national security infrastructure for a civil nuclear power programme.

It is generally accepted that the security of nuclear material is most vulnerable during transport. Nuclear power reactors require much more nuclear fuel than research reactors and correspondingly, prompt an increased need to transport nuclear material. Some small modular reactor (SMR) designs have long refuelling intervals (meaning that the transport of nuclear fuel to the reactor would be required much less frequently), but SMRs are more

likely to be located in remote locations. Any transport of nuclear fuel in Australia requires a careful examination of transport routes, and is subject to transport security plans approved by ASNO.

Some new reactor technologies, including SMRs, have design advantages that lower their inherent security and proliferation risk. However, their deployment can conversely present new security and safeguards verification challenges. New technology presents an opportunity to fashion innovative and efficient security and safeguards solutions during the design stage but will always require sound, independent regulation and the application of IAEA safeguards, including verification by IAEA inspectors. In any case, establishing the appropriate security and safeguards arrangements in Australia to meet international standards is readily achievable.

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