



13 October 2022

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Dear Dr Hirth

Principles and attributes of an effective independent regulator for nuclear-powered submarines

The Radiation Health and Safety Advisory Council (**Council**), as the statutory advisory body to the CEO of the Australian Radiation Protection and Nuclear Safety Agency (**ARPANSA**), has considered radiation protection and nuclear safety in relation to the future regulation of nuclear-powered submarines in Australia. Council advises that there are some fundamental principles and attributes for a future regulatory framework that are of critical importance to guide the formation of the future regulator and regulatory framework of nuclear-powered submarines in Australia.

Council considers that Australia has a unique opportunity to establish a regulatory framework that meets Australia's international obligations whilst also being suited to the safety and security and defence needs of Australia and embodying the values of its people. Given actual and perceived health and safety risks of nuclear-powered submarines, a robust and effective regulatory framework in Australia is essential and should be a priority. Regulatory frameworks utilised in other countries such as the United States and United Kingdom are useful for comparison and guidance. However, other countries' frameworks grew from an era of different drivers, priorities and expectations.

Safety, Security and Safeguards principles

A regulatory body of nuclear-powered submarines must have public safety as its primary focus, together with a strong safety culture. Council notes that laws alone cannot ensure nuclear safety and security; but rather a complex web of technical, legal, administrative, institutional, economic, social, political, ethical and psychological considerations is required. A strong legal framework can assist in enhancing a good nuclear safety culture by assisting to ensure the necessary regulatory resources are available, avoiding conflicts, facilitating transparency and ensuring independence.

Australia needs to comply with international non-proliferation and safeguards standards as well as ensuring nuclear safety and security continue to be met. It is important that the framework does not allow 'national security' to mask inadequate radiation safety protection of the Australian public, weaken regulatory authority, or inhibit transparency on matters of Australian public safety.

Regulation of any nuclear-powered submarine program must not undermine the integrity of the international nuclear non-proliferation regime currently overseen by the Australian Safeguards and Non-Proliferation Office (ASNO). Any agreement Australia reaches with the IAEA to facilitate the possession of nuclear-powered submarines should continue to ensure the IAEA's safeguards system operates effectively with access to facilities by IAEA safeguards inspectors. Where multiple regulators are involved with safety, security and safeguards due to the importance of nuclear non-proliferation, it is crucial to ensure clearly defined guidelines in legislation to ensure seamless regulation.

Independence principle

Council highlights the importance of independence of the regulatory authority to ensure that the regulator cannot be influenced in its decision-making process by political or economic issues, or other unwarranted interferences and can exercise its functions effectively and efficiently. This includes making and being perceived by stakeholders to make independent and unbiased regulatory decisions. The IAEA has recommended how a country's radiation safety, security and safeguards regulators can be effectively independent from undue influences on its decision making.

Independence of the regulator is a critical part of its effectiveness. The regulator should be independent of the operators and departments overseeing any aspect of purchase, manufacture, maintenance, and operation of the program. It is noted that some of the more significant global nuclear and radiation incidents have arisen from inadequate separation of responsibilities from regulatory capture. More than functional separation, it is important that the independent regulator can operate without influence, and with a strong voice. If a regulatory body cannot provide information on safety and incidents at licensed facilities without the approval of another organisation, issues of independence and transparency will arise. Reporting arrangements should therefore enable the regulatory body to be able to provide safety related information to the Government and the public with the maximum amount of transparency.

A fundamental element of an international best practice national radiation regulation framework is the operation and maintenance of a regulatory body with the legal powers and technical competence necessary. The regulatory body should be able to make decisions in line with its statutory obligations for the regulatory control of facilities and activities and be able to perform its functions without undue pressure or constraint¹. The regulatory body should be independent in its safety related decision making and hold functional separation from entities having responsibilities or interests that could unduly influence its decision making.

Transparency principle

Transparency to stakeholders is fundamental for the regulator to achieve credibility, trust and respect. The framework needs a mechanism that requires operators/licensees to make available relevant information that could have an impact on public health, safety and the environment, including nuclear and radiation safety management, discharges and emissions, incidents, near misses, and abnormal occurrences. Recognising national security issues are relevant, the criteria by which information is withheld for such purposes should be clear, and alternative approaches to public assurance provided. Transparency and openness of regulatory activities and decisions can assist with enhanced public confidence that decision-making is based on consistent best practice criteria and processes.

¹ **Governmental, Legal and Regulatory Framework for Safety**, General Safety Requirements, IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), Requirement 4 at 6.

Attributes for effective regulation of nuclear-powered submarines

Council considers that it is crucial that any future public agency regulator of nuclear-powered submarines must have the confidence of, and be trusted by the Australian public and international community. Such trust from the Australian public cannot be legislated for, or earned quickly. Importantly, the trust placed in a regulator by the Australian community will enable it to respond efficiently and effectively at times of emergency and crisis. Internationally recognised capabilities of a nuclear industry regulator include:

- Clear and consistent regulation;
- Consistent and balanced decision making;
- Accountability;
- Strong organisational capability;
- Strong management systems;
- Strong leadership;
- Sufficiently qualified staff;
- Continuous improvement, peer review and international involvement;
- A risk-based approach;
- Authoritative science and science led;
- Acknowledged legitimacy with the Australian public, government and international peers; and
- Credibility, trust and respect.

National Harmonization of Radiation Regulation

Council considers that there are challenges in Australia's federated and fragmented radiation regulatory system particularly as it relates to emergency preparedness, interstate transport, and logistics; and radioactive waste which are key aspects of any future nuclear regulatory activities.

Separate and unaligned nuclear and radiation regulatory frameworks, for example a Commonwealth nuclear powered submarine regulator apart from existing jurisdictional radiation regulators, could present a risk to public safety. While a separate nuclear regulator can provide adequate assessment and approvals processes, incident response needs 'boots on the ground' radiation incident response capability that will inevitably sit substantially within locally based agencies.

The development of a regulatory framework for nuclear-powered submarines offers an opportunity for a reformed approach across Australia, with coherence and alignment. The impetus of a submarine program can galvanise such reform, but importantly Council considers that such reform is essential to address the findings identified in the 2018 International Atomic Energy Agency's (IAEA) Integrated Regulatory Review Service (IRRS) report to ensure the effective protection of the Australian public. The 2018 IAEA IRRS recommended the Australian Government establish and implement a strategy to give effect to the policy principles and goals in the Australian Radioactive Waste Management Framework; should establish a national policy and strategy for decommissioning of facilities; and should ensure a consistent level of protection of people and the environment through effective coordination and harmonized implementation of codes and guides by the Commonwealth, States, Territories and regulatory bodies. The implications of a nuclear submarine program and the potential interfaces with, and principles of these national strategies should be considered in the development of any reformed regulatory framework.

Nuclear Competence - Capability, Training & Development

It is imperative that the regulatory body is provided with adequate human and financial capital to attract, train and retain the technical competence and experience required to regulate nuclear-powered submarines within Australia. In addition, it is important that funding is reliable and consistent. The development of competent human resources to regulate nuclear-powered submarines is as important for the regulatory body as it is for the operator. Maintaining competence leads to effectiveness as a regulator in the areas such as independence, transparency, credibility and trust. Technical capabilities of the regulatory body should be appropriate for evaluating regulatory compliance and nuclear and radiation safety, security and safeguards. ARPANSA is well-placed to build on this competence and capability.

Radiation Emergency Preparedness & Response

Australian governments have well-established emergency management arrangements that are constantly refined and enhanced through review of incidents. However, nationally integrated emergency management arrangements do not exist for large scale radiological or nuclear incidents. The infrequency of radiological or nuclear emergencies of significance within Australian jurisdictions means that the arrangements for this type of emergency have not been adequately tested, nor provided opportunity for reflection and review, limiting development and enhancement.

This limitation affects both national and state/territory emergency preparedness, and is reflected in the recommendations from the 2018 IAEA IRRS review. The national strategy for radiation safety acknowledges the limitations of emergency management arrangements in Australia. They are not fit for purpose for a future with nuclear powered submarines. Council considers that by strengthening ARPANSA's overall emergency preparedness, and by taking a leadership role in advocating for enhanced national and jurisdictional capability, this will enhance the ability of a future regulator to assess the emergency preparedness plans of regulated entities, such as the nuclear-powered submarines program.

International Nuclear Cooperation

Both the operator of the nuclear technology and the regulator of the nuclear activities should maintain close relationships with peers in other countries and relevant international organisations (where appropriate). An independent nuclear safety regulator is best placed to fulfil its international obligations, to share operating and regulatory experiences, to participate in the relevant international agreements and promote international cooperation and assistance to enhance safety globally.

Summary

Council advises that as a priority ARPANSA stress these principles and attributes to the Australian government as fundamental elements of a future Australian regulatory framework that protects the Australian public and enables the effective safety, security and safeguards regulation of nuclear-powered submarines.

In view of the evolving circumstances Council will continue to review the situation and offer you further advice when appropriate.

Yours sincerely



Dr Roger Allison

Chair

Radiation Health and Safety Advisory Council