



Commonwealth of Australia

Convention on Nuclear Safety

Australian National Report

Extraordinary Meeting of Contracting Parties

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Australian Radiation Protection and Nuclear Safety Agency



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Introduction

Australia is pleased to submit its national report to the Extraordinary Meeting of Contracting Parties to the Convention on Nuclear Safety. Australia recognises the importance of strengthening the international framework for nuclear safety including enhancing the effectiveness of the Convention.

Australia ratified the Convention on Nuclear Safety in December 1996. While it does not have any “nuclear installations” as defined in the Convention, Australia’s regulatory framework and arrangements for ensuring the safety of nuclear installations are based on the IAEA’s Safety Standards and the contemporary practices of countries with nuclear power reactors.

Following the events of the Great Eastern Japan Earthquake and Tsunami in March 2011, Australia’s nuclear safety regulator, the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), immediately mobilised its resources to provide the Australian Government and the public with accurate and timely advice on reactor status, the spread of radioactive substances, worker and public doses, consequences for human health and the environment in Japan and Australia and protective measures.

ARPANSA’s actions were coordinated with the federal Department of Health and Ageing and the Department of Foreign Affairs and Trade. The agency’s advice was based on its assessment of information published by the International Atomic Energy Agency (IAEA) and other sources. ARPANSA also called on subject matter experts from the Australian Nuclear Science and Technology Organisation (ANSTO) in the initial stage of the accident.

Scope

This report has been prepared in accordance with the guidance provided by the General Committee of the Convention in order to inform Contracting Parties of the actions, responses and new developments that have been initiated or influenced by the accident at the Fukushima Dai-ichi Nuclear Power Station.

Topic 4: National Organisations

The principal agencies involved in nuclear safety in Australia are ARPANSA and ANSTO.

National Regulatory Body:

ARPANSA was established in 1998 by the *Australian Radiation Protection and Nuclear Safety Act 1998* (ARPANS Act). The agency’s mandate extends to regulating the safety of nuclear installations and the preparedness for, and response to, accidents or malicious acts involving radiological hazards

Section 10 of the ARPANS Act prohibits the issuing of a licence authorising an Australian Government entity from building or operating a nuclear fuel fabrication plant, nuclear power plant, enrichment plant or reprocessing plant.

ARPANSA currently has just above 150 staff comprised of scientists, engineers, lawyers, policy professionals and administrative personnel. The ARPANSA Operations Services Branch (with the primary responsibility for the oversight of Australian Government licence holders) has 32 staff.

ARPANSA's financial needs are met through budget appropriation, services revenue and licence fees and charges. In 2010/2011, approximately 66% of ARPANSA's annual operating costs of A\$27 million came from budget appropriation.

The ARPANS Act is, at the time of preparation of this report, subject to review and will potentially be considered for revision and updating in 2012-13. Major issues raised for potential inclusion relate to ARPANSA's formal role in radiation and nuclear security and emergency preparedness, and enabling ARPANSA to adopt a more proportionate approach to minor non-compliance issues.

ARPANSA is committed to transparent operation. Under the ARPANS Act, all breaches of license conditions are required to be reported to the Australian Parliament. In addition, all inspection reports by ARPANSA are now published on the agency's public website.

The structure of the license for the OPAL license is closely based on IAEA approaches and guidelines.

In 2011, ARPANSA created a new Safety Analysis Section to develop tools and expertise in more holistic safety assessment (focusing on 'safety culture') in line with lessons learned internationally and not restricted to the nuclear area. This work is being done in close collaboration with license holders and the first draft safety culture assessment tool is currently with a number of license holders for review.

Regulatory documents relating to procedures and also guidance have been reviewed and updated continuously and are incorporated into the quality management system for the Branch.

The licence for the OPAL research reactor required that a PSR be undertaken two years after the completion of commissioning, and that process is currently underway. Part of the PSR is to assess OPAL's siting, design and operation in light of the 2011 Japanese earthquake. In addition, the PSR will produce an action plan with priorities, a timetable for implementation, and how ANSTO intends to demonstrate that the actions are completed. A preliminary assessment report by ANSTO received in December 2011 is encouraging. However, ARPANSA has requested that ANSTO give consideration to some additional issues related to OPAL's operational life.

Operating Organisation:

ANSTO is an agency within the Australian Government portfolio of Industry, Innovation, Science, Research and Tertiary Education. ANSTO is responsible for delivering specialised advice, scientific services and products to government, industry, academia and other research organisations. It does so through the development of new knowledge, delivery of quality services and support for business opportunities.

ANSTO operates the OPAL 20 MW_{th} research reactor at Lucas Heights in southwest Sydney. Following the nuclear accident at the Fukushima Dai-Ichi NPP, ANSTO conducted a review of OPAL Safety Case to identify and lesson learnt and remedial actions that may be necessary. This report was presented to ARPANSA in December 2011. An updated version of the report is currently being prepared.

The review included analysis of the likelihood and impact of the following events and issues on OPAL:

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- station blackout for less than 30 minutes, between 30 minutes and 10 days and for more than 10 days;
 - individual external events including aircraft impact, bushfires, industrial and transport accidents, military activities, onsite-activities, extreme wind and earthquakes; other external events such as tsunami flooding were deemed incredible due to OPAL being 150 metres above sea level;
 - combination of these external events both in conjunction and in succession;
 - hydrogen explosions;
 - spent fuel cooling; and
 - venting of containment.

The report concluded that there were no safety implications for OPAL from the accident at the Fukushima Dai-Ichi NPP due to the fundamental design differences between the two reactors. However, it was recommended that the OPAL Safety Analysis Report be updated to:

- increase the analysis of a station blackout from the current 10 days to 15 days;
- include analysis on the combination of external events; and
- include analysis of a 15 day station blackout when the operational core has been temporarily unloaded to the service pool during a major shutdown.

Topic 5: Emergency Preparedness and Response and Post-Accident Management

National:

Regulations under the ARPANS Act prescribe requirements for on-site emergency plans for 'nuclear installations' as defined under the Act.

The Regulatory Guideline to the ARPANS Regulations is summarised as follows:

- Detailed emergency plans for any action that could give rise to a need for emergency intervention. These plans should be based on an assessment of the consequences of reasonably foreseeable accidents, including accidents with off-site consequences, and should aim to minimise the consequences and ensure the protection of on-site personnel, the public and the environment.
- Comprehensive emergency procedures are to be prepared in accordance with the objectives of the emergency plan.
- All external organisations identified in the emergency plan are to be prepared for such emergencies, and adequate facilities and equipment are to be available and maintained.

ANSTO submitted an OPAL Reactor Emergency Plan as part of the Application for an Operating Licence. The implementation of these plans is regularly discussed with emergency response agencies, the local council and others at the ANSTO Local Liaison Working Party. This involves discussions on exercises, public information and changes to emergency plans or arrangements. ARPANSA has an observer role on the Local Liaison Working Party. The ANSTO general emergency plans and arrangements are available in the local public libraries.

In addition to the OPAL Emergency Plan, ANSTO has an emergency plan for the entire site. ANSTO's emergency plans form part of an overarching Disaster Plan (DISPLAN) for the State of New South Wales. The DISPLAN has been developed and accepted by relevant

agencies including the NSW Police, and State Emergency Services. Review of the plans is ongoing and regular meetings of the relevant agencies are held to plan exercises and discuss changes. There is also a specific sub-plan covering a major event at ANSTO, which may involve evacuation of a 3 kilometre radius around the site.

Assessments of the radiological consequences of acts of sabotage and terrorism in relation to OPAL have been undertaken by ANSTO and reviewed by ARPANSA. It has been concluded that the current emergency plans and arrangements, including adoption of the World Health Organization (WHO) guidelines for the dissemination of iodine tablets, provide adequate protection of the public for such events.

Australia also receives visits to its ports from foreign Nuclear Powered Warships. Australia maintains a robust process for the radiological assessment of suitability of ports for these visits and has in place emergency planning at the national and local levels to respond to any radiological emergencies associated with these visits.

ARPANSA, as the advisor to the Australian Government on preparedness and response to radiological and nuclear emergencies, has a key role in any emergency that may occur on the ANSTO site. Consistent with the IAEA *Safety Requirements Preparedness and Response for a Nuclear or Radiological Emergency* (GSR 2) ARPANSA acts as an advisory body to government and response organisations in respect of nuclear safety and radiation protection.

International:

The geographical isolation of Australia from neighbouring States precludes any possibility that an emergency in OPAL will impact on the population of neighbouring States. However, Australia is a Party to the Convention on the Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. ARPANSA is the designated National Competent Authority for these Conventions in the event of a nuclear or radiological emergency and the Attorney General's Department Coordination Centre is the designated Australian National Warning Point.

Australia is not geographically close to neighbouring States currently operating a nuclear installation and this minimises the possibility that an emergency in such an installation would impact on the Australian population. Nevertheless, Australia has appropriate precautions in place in relation to radiation emergencies in other countries, including the monitoring of imported foodstuffs.

Since the devastating earthquake and tsunami struck Japan, ARPANSA and the Department of Health and Ageing have been continually assessing the nuclear situation in Japan in order to properly advise the Australian Government and public on radiation protection and nuclear safety issues associated with the nuclear emergency. During the nuclear emergency phase, ARPANSA provided around the clock technical advice to the Australian Government response that was coordinated by the Australian Department of Foreign Affairs and Trade. Subject matter experts from ANSTO also assisted in this immediate response with the provision of advice.

ARPANSA used weather prediction data provided by the Australian Bureau of Meteorology to model on a daily basis the movement of airborne radioactive plumes, both potential and real, to ensure that Australians were given adequate advice while in Japan. Through its links with the IAEA, WHO and other Australian Government agencies, ARPANSA was able to monitor the radiation situation in Japan and beyond. Radiation protection advice was

provided through the ARPANSA website and updated on a regular basis. ARPANSA also established an information service to ensure that individual enquiries on the nuclear emergency situation in Japan were responded to in an effective and timely manner.

For the weeks after the accident, Comprehensive Nuclear-Test-Ban Treaty (CTBT) radionuclide monitoring stations throughout the northern hemisphere measured trace quantities of radioactive material in air coming from Japan. ARPANSA detected trace amounts of xenon-133 at the Darwin CTBT air monitoring station, which while detectable, were found to be at insignificant levels. No other detections were made in any of the six CTBT air monitoring stations maintained by ARPANSA.

Foods produced in the areas affected by the nuclear emergency at the Fukushima nuclear power plant have the potential to be contaminated with radioactive materials. ARPANSA worked with Australia's food standards regulator Food Standards Australia New Zealand in assessing the available information on the levels of contamination levels in water, milk and foodstuffs in Japan and to screen foodstuffs from Japan, to ensure that Australians were properly informed and protected.

The events of the Great Eastern Japan Earthquake confirmed ARPANSA's capability to act, assess and provide advice to the Australian Government in a radiological/nuclear emergency.

During the Fukushima accident, ARPANSA was Australia's trusted source for accurate information and advice. ARPANSA's response to the accident was considered a 'Good Practice' by the review team that performed the 2011 follow-up IRRS mission to Australia. The experience and lessons learned in responding to the event are being incorporated into the development of an agency-wide Emergency Preparedness Plan that will coordinate the agency's scientific, regulatory, governmental and public communications capabilities during an incident or emergency.

Topic 6: International Cooperation

As part of performing its regulatory, scientific and advisory functions under the ARPANS Act, ARPANSA undertakes a broad range of international nuclear safety related activities. In fact, the ARPANS Act expresses a positive requirement on the CEO to take into account international best practice in radiation protection and nuclear safety in considering licence applications and monitoring of licence conditions. ARPANSA's international program also includes activities to support emergency preparedness and response arrangements at a domestic, regional and international level.

Consistent with steps taken internationally to conduct 'stress' tests of nuclear power reactors, ARPANSA has required ANSTO to extend the PSR currently being undertaken for the OPAL research reactor to take into account the lessons learned from the Great East Japan earthquake and tsunami including preparation of an action plan setting priorities and a timetable for implementation of improvements that are identified.

Australia, through its membership of the Commission on Safety Standards and the Safety Standards Committees, is engaged in the IAEA's process to review the effectiveness of, and identify improvements to, the IAEA Safety Standards series in light of the events in March 2011. ARPANSA will consider the implications of the process for Australia's regulatory framework as soon as practicable.

Australia supports international activities to strengthen radiological and nuclear emergency preparedness and response through its participation in the National Competent Authority meetings and activities and its support to the IAEA Radiation Assistance Network (RANET). Australia has nominated radiation emergency response capabilities drawn from ARPANSA and ANSTO for membership of RANET.

At the IAEA Ministerial Conference on Nuclear Safety held in June 2011, Australia proposed that information on compliance with IAEA Safety Standards and the recommendations and resulting actions of IAEA safety missions be included in national reports submitted under the Convention. The proposal has been incorporated into the IAEA Action Plan and Australia will submit draft amendments to the guidelines on national reporting for consideration at the Extraordinary Meeting.

In November 2011, ARPANSA received a follow-up assessment of the IRRS ‘full scope’ mission conducted in 2007. The follow-up assessment concluded that the majority of recommendations and suggestions of the original mission in 2007 could be closed. The follow-up mission also included policy discussions on emergency preparedness and response, radioactive waste management, and patient protection in the context of national uniformity. The final report of the follow-up mission will be posted on ARPANSA’s website (www.arpansa.gov.au) consistent with common practice.