

Convention on Nuclear Safety Joint 8th and 9th Review Meeting – 2023



International Atomic Energy Agency IAEA, Vienna

Country Review Report for AUSTRALIA

Drafted by Country Group [N° 2]

(Australia, Belarus, Cuba, Czech Republic, France, Libya, Morocco,
Niger, Portugal, Slovenia, Spain, Syrian Arab Republic, The
Netherlands)

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DISCLAIMER: Per INFCIRC 571, Revision 7, Para. 16-19 and Annex IV, Contracting Parties were invited to comment on the implementation of the CNS reporting guidance. Contracting Parties were also encouraged to submit proposed Good Practices, Challenges, and Suggestions prior to the Review Meeting. The draft Country Review Report documents the preliminary observations identified by the Contracting Parties. The Country Review Report is the result of the CNS Review Process and was agreed by consensus by the Country Group.

Glossary

The Glossary provides here the definitions of “Challenges”, “Suggestion” and “Good Practice” according to Annex IV of INFCIRC/571/Rev. 7. The definition of “Area of Good Performance” was agreed upon by the Officers of the 8th CNS Review Meeting at the CNS Officers’ Meeting on 24 to 25th September 2019.

A **Challenge** is “a difficult issue for the Contracting Party and may be a demanding undertaking (beyond the day-to-day activities); or a weakness that needs to be remediated.”

A **Suggestion** is “an area for improvement. It is an action needed to improve the implementation of the obligations of the CNS.”

A **Good Practice** is “a new or revised practice, policy or programme that makes a significant contribution to nuclear safety. A Good Practice is one that has been tried and proven by at least one Contracting Party but has not been widely implemented by other Contracting Parties; and is applicable to other Contracting Parties with similar programmes.”

An **Area of Good Performance** is “a practice, policy or programme that is worthwhile to commend and has been undertaken and implemented effectively. An Area of Good Performance is a significant accomplishment for the particular CP although it may have been implemented by other CPs.”

Executive Summary

Australia does not have any ‘nuclear installations’ as defined under Article 2 of the CNS. Australia has no nuclear power plants, and none are planned. Australia operates one operating research reactor, the Open-Pool Australian Light Water Reactor (OPAL). Another research reactor, the High Flux Australian Reactor (HIFAR), has been permanently shut down, awaiting decommissioning and all fuel elements have been removed.

Two (2) out of three (3) Challenges from the 7th Review Meeting have been closed. One (1) challenge remain open due to its long-term nature and is from the 6th CNS review meeting.

Country Group 2 highlights the following measures to improve safety in Australia’s national nuclear programme:

- In the last reporting period, a number of amendments have been made to the ARPANSA Regulations 2018, including the requirement for new licence applicants to submit a Safety Analysis Report (SAR) and a Decommissioning Plan for each stage of licensing; introduction of cost-recovered licence application fees for complex facilities, including an hourly rate, to reflect the true cost of assessment; and the introduction of a requirement for licence holder to review and update plans and arrangements for managing safety following safety events.
- ARPANSA also introduced a new obligation in the Regulations for licence holders to minimise/prevent human errors and organisations failures involving controlled materials, apparatus or controlled facilities and to include consideration of human factors in their Safety Analysis Reports.
- ARPANSA also published a new regulatory guide: Preparation of the Safety Analysis Report for Non-Reactor Facilities in March 2021 to provide further explanation and clarification of ARPANSA’s expectations for the preparation and maintenance of a safety analysis report for non-reactor facilities.
- ARPANSA recently sought stakeholder feedback, including public comment, on a draft advisory note on public health considerations for disposal of radioactive waste. The note informs how health and well-being will be considered as part of licence applications such as those relating to the government’s proposed NRWMF.
- In 2019, in response to another recommendation from the 2018 IRRS mission, ARPANSA developed and piloted a custom-built safety culture maturity model within the Regulatory Services Branch (RSB). The model was consistent with the guidance for safety culture assessment of the International Atomic Energy Agency (IAEA) Safety Standard GS-G-3.5 The Management System for Nuclear Installations although modified to be more targeted at the role of the regulator rather than the operator. The results of the initial safety culture assessment has

been published on the ARPANSA website with a follow up assessment planned for October 2023.

- In 2022 the OPAL completed the analysis of design extension conditions (DEC) and updated the safety analysis report accordingly. No additional mitigations for nuclear safety were required as a result of this analysis. As a result of an IRRS mission suggestion, ARPANSA now requires all appropriate facilities to complete DEC analysis.

The Second OPAL Periodic Safety and Security Review (PSSR) was completed in 2021 and is undergoing assessment by ARPANSA. The Country Group highlights the following results of international peer review missions of Australia.

- **IRRS Mission**

A full scope IRRS mission to Australia occurred 4–16 November 2018, which reviewed Australia’s national, legal and governmental framework for nuclear and radiation safety against the IAEA’s Safety Standards. This mission included participation from all Australian self-governing states and territories, as well as the Commonwealth of Australia (the federal Australian Government). This was the first IRRS mission to undertake a comprehensive multi-jurisdictional review of a federated constitution in which all of the jurisdictions are self-governing. The mission found 4 good practices and made 23 recommendations and 12 suggestions for improvement which are actively being progressed by all relevant bodies. Out of these, eight recommendations and six suggestions were directly addressed to the Commonwealth regulator, ARPANSA.

A follow-up mission will be conducted in October 2023. The follow-up mission had been delayed due to the COVID-19 pandemic.

The Country Group identified 3 Challenge(s) for Country Australia.

- **Challenge 2023-01:** Engagement with the wider Australian community over planned waste facilities.
- **Challenge 2023-02:** Resource and skill recruitment and retention remains an ongoing challenge with an increased Decommissioning programme of work and planned New Facilities.
- **Challenge 2023-03:** Implementing an action from the IRRS mission to develop a National Radiation Protection Strategy to strengthen harmonisation and National Uniformity.

In addition, the Country Group identified 0 Suggestions, 2 Areas of Good Performance and 0 Good Practices.

- **Area of Good Performance 2023-01:** ARPANSA's proactive policy of transparency and openness of the Regulatory authority is commendable. ARPANSA has undertaken a

Country Review Report for Australia

stakeholder engagement project with significant outreach activities beyond those required by regulation.

- **Area of Good Performance 2023-02:** ARPANSA's has implemented an independent verification environmental monitoring programme.

Country Group 2 concluded that Australia:

- Submitted National Reports for the 8th CNS Review Meeting and for the Joint 8th and 9th CNS Review Meeting and therefore complies with Article 5 and in time, following Rule 39 of INFCIRC/573/Rev.6.
- Attended the Joint 8th and 9th CNS Review Meeting, and therefore complies with Article 24.1.
- Held a national presentation and answered questions during the Joint 8th and 9th CNS Review Meeting, and therefore complies with Article 20.3. Basic Information on Australian Nuclear Programme

1. Basic Information on Australia Nuclear Programme

Australia does not have any ‘nuclear installations’ as defined under Article 2 of the CNS. Australia has no nuclear power plant, and none are planned. Australia operates one operating research reactor, the Open-Pool Australian Light Water Reactor (OPAL). Another research reactor, the High Flux Australian Reactor (HIFAR), has been permanently shut down awaiting decommissioning and all fuel elements have been removed.

Both reactors are managed by the Australian Nuclear Science and Technology Organisation (ANSTO), an Australian Government entity, and are regulated by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). The reactors are located at the Lucas Heights Science and Technology Centre south of Sydney in the State of New South Wales.

2. Follow-Up from previous CNS Review Meeting

2.1 Challenges

Australia provided the following updates on Challenges identified during the 7th CNS Review Meeting:

- **Challenge 1.** Acquire and maintain adequate resourcing and competence within the regulator to cope with additional/new work and activities.

Follow-Up Status: **Closed**

Basis

The staff number at the ARPANSA RSB branch is considered adequate for regulatory oversight of the licence holders following the implementation of the Regulatory Delivery Model (now superseded by the Inspection Manual, Review and Assessment Manual and Compliance and Enforcement Manual), that applied resources to inspection and compliance monitoring using a graded, risk-informed approach..

ARPANSA has benchmarked the regulatory framework against the IAEA General SSG-12 and 13 which resulted in an action plan regarding further resourcing which included use of external contractors and secondment of regulatory staff from State and Territory regulators. ARPANSA has developed an updated Workforce Strategy and supporting Program Plan for 2022-25. The Plan notes that capability and workforce planning including operational workforce planning is one of the key areas for focus and this includes reviewing the identification, development and maintenance of competency requirements.

The IAEA Methodology for the Systematic Assessment of the Regulatory Competence Needs (SARCoN) for Regulatory Bodies of Nuclear Installations has been used to perform this review for staff in RSB. In addition, ARPANSA has completed a comprehensive review of all positions in the organisation as part of ongoing succession planning. This included identification of vulnerable areas and priority areas for strengthening resilience of some key competencies.

ARPANSA is working on knowledge management approaches including knowledge management and knowledge transfer plan and is developing a knowledge resilience map based on critical and/or core knowledge. ARPANSA has identified key areas of concern for knowledge loss by conducting a skills audit and mapping out the current and future operational needs. A draft knowledge management plan is being developed, taking into account the deliverables in light of key strategic activities and the results of the knowledge resilience map and knowledge risk assessment. ARPANSA is recommending its graduate program also in 2023.

The 2018 IRRS mission noted that ARPANSA has a well-developed strategy to compensate for the departure of qualified staff that systematically assessed succession risks for every position in the organization and prioritised the development of competencies that were found to be vulnerabilities to the long-term capability of the organisation. This was considered a Good Practice by the IRRS Team.

In addition, the follow-up statuses of the following two challenges identified in the 6th CNS Review Meeting were assessed as “Open” in the 7th Review Meeting (Actions have been taken, but due to the nature of the challenge, it is still on-going):

- **Challenge 2 in 6th RM:** Maintenance of competence within both the operator and regulator, including readiness to cope with expected applications for new (non-reactor) facilities. (In the 7th RM, Actions have been taken, but due to the nature of the challenge, it is still on-going)

Follow-Up Status: Closed

Basis

See above response to challenge. In addition, ARPANSA requires ANSTO to demonstrate adequate managerial structure and resources. This includes demonstrating clear lines of authority as well as systems for staff selection, training, and personnel stability. OPAL continues to maintain competence through the approved OPAL training plan which draws on IAEA Tech Doc 525 and NS-G4.5).

- **Challenge 3 in 6th RM:** Engagement with the wider Australian community over planned waste facilities.

Follow-Up Status: **Open (in progress)**

Basis

ARPANSA approved a licence to prepare a site for a new temporary waste storage facility (Intermediate Level Waste Capacity Increase - ILWCI) at ANSTO in March 2022. The outcome of the licence decision was announced along with the report detailing the regulatory assessment of the application and a statement of reasons published by the CEO when making the decision. As part of the decision ARPANSA conducted public consultation as per the requirements of the Regulations. The submissions made by the public and ARPANSA's responses are available on the ARPANSA website.

ARPANSA continues to undertake a stakeholder engagement project for the NRWFM where possible... This is not required under the Act or Regulations, but ARPANSA believes this is best practice. Activities include engaging in outreach activities with the communities that were identified in the site selection process to inform the public and local organisations on the regulatory process, ARPANSA's role, and what the public can expect in terms of interaction with the regulator during review and assessment of an application to prepare a site for a waste facility.

2.2 Suggestions

There were no suggestions identified for Australia.

3. Measures to improve safety

3.1 Changes to the regulatory framework and the national nuclear programme

Since the last Review Meeting, the Country Group took note of the following changes to the regulatory framework and the national nuclear programme:

- In the last reporting period, a number of amendments have been made to the ARPANSA Regulations 2018, including the requirement for new licence applicants to submit a Safety Analysis Report (SAR) and a Decommissioning Plan for each stage of licensing; introduction of cost-recovered licence application fees for complex facilities, including an hourly rate, to reflect the true cost of assessment; and the introduction of a requirement for licence holder to review and update plans and arrangements for managing safety following safety events.
- ARPANSA also published a new regulatory guide – Preparation of the Safety Analysis Report for Non-Reactor Facilities in March 2021 to provide further explanation and clarification of ARPANSA's expectations for the preparation and maintenance of a safety analysis report for non-reactor facilities.

- ARPANSA also introduced a new obligation in the Regulations for licence holders to minimise/prevent human errors and organisations failures involving controlled materials, apparatus or controlled facilities and to include consideration of human factors in their Safety Analysis Reports.
- ARPANSA published an advisory note on public health considerations for disposal of radioactive waste in 2023. The note informs how health and well-being will be considered as part of licence applications such as those relating to the government’s proposed NRWFMF.
- In 2019, in response to another recommendation from the 2018 IRRS mission, ARPANSA developed and piloted a custom-built safety culture maturity model within the Regulatory Services Branch (RSB). The model was consistent with the guidance for safety culture assessment of the International Atomic Energy Agency (IAEA) Safety Standard GS-G-3.5 The Management System for Nuclear Installations although modified to be more targeted at the role of the regulator rather than the operator. The results of the initial safety culture assessment has been published on the ARPANSA website¹⁴ although the actions are ongoing, having been delayed by the COVID-19 pandemic. A follow up assessment is planned for 2023.
- In 2022 the OPAL research reactor completed the analysis of design extension conditions (DEC) and updated the safety analysis report accordingly. No additional mitigations for nuclear safety were required as a result of this analysis. As a result of an IRRS mission suggestion, ARPANSA now requires all appropriate facilities to consider DEC analysis.
- The Second OPAL Periodic Safety and Security Review (PSSR) was completed in 2021 and is undergoing assessment by ARPANSA.

3.2 Safety improvements for existing nuclear power plants

There are no existing Nuclear Power Plants in Australia therefore this section is not applicable.

3.3 Response to international peer review missions

➤ IRRS Mission

The Country Group took note of the following implemented or planned measures in response to the results of international peer review missions:

A full scope IRRS mission to Australia occurred 4–16 November 2018, which reviewed Australia’s national, legal and governmental framework for nuclear and radiation safety against the IAEA’s Safety Standards. This mission included participation from all Australian self-governing states and territories⁷, as well as the Commonwealth of Australia (the federal Australian Government). This was the first IRRS mission to undertake a comprehensive multi-jurisdictional review of a federated constitution in which all of the jurisdictions are self-governing.

The mission found 4 good practices and made 23 recommendations and 12 suggestions for improvement. Out of these, eight recommendations and six suggestions were directly addressed to the Commonwealth regulator, ARPANSA. A follow-up mission will be conducted in October 2023. The follow-up mission had been delayed due to the COVID-19 pandemic.

Australia has developed a national action plan to provide strategic guidance and progress on implementation of the findings of the 2018 IRRS mission. The plan provides a governance structure for monitoring progress against the findings and has been endorsed by the Australian Health Protection Principal Committee (AHPPC).

Work is progressing within the Environmental Health Standing Committee (enHealth), a subcommittee of the Australian Health Protection Principal Committee (AHPPC), to address the findings addressed to all the jurisdictions. While COVID-19 has impacted the work program, a number of the findings have been partially addressed and work is ongoing to address as many in full before the return mission. As of August 2022, ARPANSA has completed 12 of the 14 ARPANSA specific findings from the action plan and continues to support the implementation of the multi-jurisdictional findings. ARPANSA aims to complete all 14 ahead of the follow-up mission.

4. Implementation of the Vienna Declaration on Nuclear Safety (VDNS)

Australia has no nuclear installations and no plan for their construction; therefore, it did not need to provide information on the implementation of the VDNS. However, Australia report that they continue to meet the three Principles in the Vienna Declaration on Nuclear Safety (VDNS) in respect to the OPAL research reactor.

Principle 1: Australia reported that it continues to take into account the principles of the VDNS. For example, the OPAL licence approval took into account the elements of the VDNS, namely prevention of accidents during the commissioning and operations phase, application of the defence-in-depth principle, assessment of common cause failure. In addition, ARPANSA must, under the Act, take into account international best practice in radiation protection and nuclear safety

Principle 2: The OPAL and ANSTO are required to conduct Periodic Safety and Security Reviews. OPAL submitted a PSSR to ARPANSA in November 2021. This is currently under review by ARPANSA. This PSSR covered 15 Safety Factors and 18 Security Factors and included an assessment of the integration between safety and security.

Lastly, Australia meets the Vienna Declaration Principle 3 in relation to Research Reactors: taking into account IAEA Safety Standards and other good practises identified in Review Meetings of the CNS by

Restricted

imposing a licence condition to require OPAL to assess and report on DECs as per the IAEA SSR-3 Safety of Research Reactors Requirement 22. The DECs were submitted to ARPANSA in June 2021 in the form of a revision to the OPAL Safety Analysis Report and have now been approved by ARPANSA. This requirement has now been extended to all appropriate facilities by ARPANSA

5. Results of the Review

5.1 General Quality of the National Report

Contracting Parties and officers were invited to provide general comments on the National report of Australia (e.g., report submitted on time), addressed all articles, addressed the Vienna Declaration on Nuclear Safety, and addressed all Challenges, the general quality of its National Report, transparency issues, and the compliance with the CNS guidance documents and Major Common Issues identified in the previous CNS Review Meeting.

With regards to the general quality of the National Report and transparency issues, the members of the Country Group made the following observations:

- The Report is qualified to be comprehensive and reader friendly.

With regards to the compliance with the requirements of the CNS and its Guidelines, the members of the Country Group made the following observations:

- The Report for the 8th CNS Review Meeting was submitted before the deadline of 15 August 2019.
- The content and structure of Australia's National Report complies with the CNS guidance.
- The two challenges identified in the 6th CNS review meeting remain open due to their ongoing nature
- The directions given by the President of the 8th Review Meeting were mostly followed.
- The Australian Report for the 8th and 9th CNS Review Meeting was submitted on the deadline of 5 August 2022
- The content and structure of Australian National Report for the Joint 8th and 9th CNS Review Meeting do comply with the CNS guidance
- The directions of the Summary Report of 7th CNS Review Meeting were taken into consideration in the Report for the Joint 8th and 9th CNS Review Meeting.

5.2 Participation in the Review Process

With regards to Australian participation in the Review process, the members of the Country Group made the following observations. Australia

In the 8th CNS Review Cycle, Australia

- did post questions to the Contracting Parties.
- delivered answers to the questions of Contracting Parties on time.
- delivered its national presentation.

In the 9th CNS Review Cycle, Australia –

- did post questions to the Contracting Parties.
- delivered answers to the questions of Contracting Parties on time.
- delivered its national presentation during the Joint 8th and 9th Review Meeting

5.3 Challenges

The Country Group identified 3 Challenge(s) for Country Australia.

- **Challenge 2023-01:** Engagement with the wider Australian community over planned waste facilities.
- **Challenge 2023-02:** Resource and skill recruitment and retention remains an ongoing challenge with an increased Decommissioning programme of work and planned New Facilities.
- **Challenge 2023-03:** Implementing an action from the IRRS mission to develop a National Radiation Protection Strategy to strengthen harmonisation and National Uniformity.

5.4 Suggestions

The Country Group identified no Suggestion(s) for Country Australia.

5.5 Good Practices and Area of Good Performance

During the peer review of Australia's National Report, the Contracting Parties were invited to recommend Good Practices and to highlight Area of Good Performance.

The Country Group did not identify any Good Practices.

The following Area of Good Performance of Australia were commended by the Country Group

- **Area of Good Performance 2023-01:** ARPANSA's proactive policy of transparency and openness of the Regulatory authority is commendable. ARPANSA has undertaken a stakeholder engagement project with significant outreach activities beyond those required by regulation.
- **Area of Good Performance 2023-02:** ARPANSA's has implemented an independent verification environmental monitoring programme.

5.6 Response to COVID-19 Situation

The Country Group took note of the following information related to the COVID-19 pandemic:

Australia reported that the licensee took the following actions or implemented the following safety measures to address difficulties or impacts from the pandemic:

- ANSTO responded to the pandemic by acting with the aim of ensuring that critical operations, particularly for nuclear medicine, continued to be conducted in a safe and compliant manner. In light of this, the following response measures were implemented across the entire organisation:

ANSTO implemented the following key arrangements for the OPAL research reactor:

- Access Restrictions - The reactor building was restricted to essential staff only with the Main Control Room (MCR) further restricted to a need to be present basis only (i.e. no access for any non-operations staff members) and strict social distancing was enforced.
- Increased Hygiene and health measures - Entry to the MCR was not permitted without a body temperature check and hand wash and twice per shift including shift handover, the operator staff conducted a deep clean of all surfaces in the MCR.
- *Way of working* - Paper based issue of permits/sign off for Operational Limits and Condition forms were minimised where practical with approvals completed by email or other online methods where possible.
- *Maintenance* - All planned maintenance was graded based on the frequency of the maintenance, the likelihood of failure within that frequency and the consequences on the safety and reliability of OPAL with only essential work conducted. In practice, most in-house maintenance was completed as scheduled by each group working slightly longer hours than normal when they were on site.
- *Working from Home* - Staff that did not require a direct operational need or have planned training worked from home. Attendance of operations, key management, maintenance and other personnel on site was staggered. The OPAL Maintenance Group was split into two teams to reduce potential spreading of the virus across the whole team. However, if needed (such as during a shutdown), most of the team came to work as the workload was too much for half the team to manage. At such times, appropriate COVID safe work arrangements were implemented (mask, distancing etc.).
- *Training* - Training of new reactor operation staff, was accelerated whilst refresher training of ex-operators who currently work on other areas of site was undertaken to ensure future resources are available if required.
- *Supply Chain* - The ANSTO executive team focused on the supply chain for reactor operation to ensure there is no interruption in receipt of essential supplies, including PPE.

The changes that were implemented at OPAL specifically, and across ANSTO more broadly, were evaluated for safety significance by ANSTO and reported to ARPANSA.

Australia reported that the regulator took the following actions or implemented the following safety measures to address difficulties or impacts from the pandemic:

ARPANSA's key response to the pandemic was as follows:

- Regulatory inspections mostly continued as planned although time on site was reduced where possible (use of video link etc.). Where attendance at site could not be avoided, social distancing and hygiene controls were applied.
- All licence holders were requested to provide their response to the COVID-19 pandemic in writing that were then assessed by ARPANSA to ensure ongoing safety/security of facilities and sources.
- ARPANSA staff worked from home in line with government advice. The presence of staff in the work premises was restricted to only those carrying out essential functions.
- After the roll out of the national vaccination program, only fully vaccinated ARPANSA staff were permitted to attend licence holders' premises.

As of August 2022, the majority of COVID-19 restrictions have been removed in Australia and the operations of the OPAL reactor is back to pre-pandemic status and ARPANSA is operating at a level and tempo that is commensurate for effective regulation.

Australia did not report any significant issues with the COVID-19 pandemic and hence no lessons learned/ \ areas of improvement or enhancements from the actions taken were proposed in the National Report relating to this.

6 Fulfilment of CNS Review Requirements

The Country Group concluded that: Australia

- Submitted a National Report for the 8th CNS Review Meeting and for the Joint 8th and 9th CNS Meeting, and therefore complies with Article 5 and in time following Rule 39 of INFCIRC/573 Rev 6.
- Attended the Joint 8th and 9th CNS Review Meeting, and therefore complies with Article 24.1
- Held a national presentation and answered questions, and therefore complies with Article 20.3