



Alternative Commonwealth Capabilities for Crisis Response: Discussion Paper

ANSTO Submission

October 2023

ANSTO RESPONSE TO THE NEMA ALTERNATIVE COMMONWEALTH CAPABILITIES FOR CRISIS RESPONSE DISCUSSION PAPER – AUGUST 2023

Executive Summary

The Australian Nuclear Science and Technology Organisation (ANSTO) welcomes the opportunity to provide a written submission to support the National Emergency Management Agency (NEMA) discussion paper on Alternative Commonwealth Capabilities for Crisis Response.

ANSTO is the national organisation for nuclear science and technology. We focus on undertaking leading edge research, delivering innovative scientific solutions and services, and providing specialised advice to government, industry, academia and other research organisations.

ANSTO leads the development of a nuclear capable workforce aligned with government policy objectives. This includes Commonwealth crisis capability as outlined in the Australian Government Crisis Management Framework (AGCMF). ANSTO subject matter experts are recognised in nuclear operations, nuclear safety, radiation protection, holistic safety management, nuclear forensics, waste management, radiological monitoring equipment calibration, and radiation detection and imaging border security technology.

ANSTO maintains specialised Radiological or Nuclear Emergency Preparedness and Response (RNEPR) monitoring capability to support assessment of radiation levels and survey extent of radioactive contamination in the event of a radioactive release from a nuclear or radiological emergency. ANSTO currently contributes to State, Territory, and Commonwealth preparation and response for a radiological or nuclear incident across the National Disaster Management and Recovery Continuum. The capabilities and roles of these ANSTO teams are consistent with the requirements of the International Atomic Energy Agency (IAEA) Response and Assistance Network (RANET) capabilities.

ANSTO has an established relationship with the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), which as the Australian Government's primary authority on radiation protection and nuclear safety, co-ordinates radiological emergency response capability through the Radiation Emergency Coordination Centre in Melbourne.

ANSTO acknowledges the important contribution of the Australian Defence Force (ADF) to civil community emergencies, however, this is not their primary role. The scoping of capabilities required by the Commonwealth Government for effective support to State and Territory-led crisis response and recovery efforts provides an alternative to the ADF.

This submission outlines current and potential future specialist domestic capabilities that ANSTO offers. These could make a positive impact on Australia's capacity to handle concurrent crises and build capabilities for an effective Commonwealth civil community response.

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1. Introduction

1.1. ANSTO Act 1987

The ANSTO Act 1987 section 5 outlines a range of functions relevant to emergency preparedness and response activities, including:

- (a) to undertake research and development in relation to:
 - (i) nuclear science and nuclear technology; and
 - (ia) the application and use of nuclear science and nuclear technology; and
 - (iii) such other matters as the Minister directs; and
- (bc) to condition, manage and store radioactive materials and radioactive waste at the request of:
 - (i) a law enforcement agency; or
 - (ii) a Commonwealth, State or Territory agency responsible for the management of emergencies or disasters; including, but not limited to, radioactive materials or radioactive waste involved in, or arising out of, a radiological incident or a radiological emergency.
- (e) to provide advice on aspects of:
 - (i) nuclear science and nuclear technology; and
 - (ii) the application and use of nuclear science and nuclear technology; and
 - (iii) other matters related to its activities; and
- (ea) to make available to other persons, whether or not on a commercial basis, the knowledge, expertise, equipment, facilities, resources and property of the Organisation by:
 - (i) providing training and management expertise; or
 - (ii) selling or leasing equipment; or
 - (iii) leasing land, buildings and facilities; or
 - (iv) taking any other action that the Organisation thinks appropriate; and
- (f) to co-operate with appropriate authorities of the Commonwealth, the States and the Territories, and with other organisations and institutions in Australia or elsewhere, in matters related to its activities;

2. Existing Arrangements Radiological Nuclear: Prevention, Preparedness, Response and Recovery

2.1. ANSTO Trusted Cooperation in Nuclear Safety

This submission provides an overview of technical capability (personnel and equipment) required for ANSTO, to resolve national challenges as described in the ANSTO Board Letter of Intent. ANSTO is a trusted advisor to government and Australia's source of nuclear expertise, advice and services to governments, academia, industry, and community.

ANSTO's operation of nuclear (and non-nuclear) facilities and equipment requires close interactions with regulatory bodies such as ARPANSA, to provide on behalf of the Commonwealth, a co-ordinated response capability.

2.2. National and State/Territory Plans and Arrangements

In Australia, state and territory governments have primary responsibility for protecting life, property and environment within their borders. They have established plans and arrangements to prevent, prepare for, respond to, and recover from, natural and human-caused emergencies. ANSTO has a range of specialist radiological and nuclear incident response capabilities that complement State and Territory efforts. ANSTO currently contributes capability to the States, Territories and Commonwealth in their preparation for, and response to a radiological or nuclear incident.

- Home Affairs, NEMA, The Australian Government Disaster Response Plan 2020 (COMDISPLAN).
- Home Affairs, NEMA, The Australian Government Space Re-entry Debris Plan 2017 (AUSSPREDPLAN).
- Australia-New Zealand Counter-Terrorism Committee, National Counter-Terrorism Plan 2022.
- Department of Health and Aged Care, Domestic Health Response Plan for Chemical, Biological, Radiological or Nuclear Incidents of National Significance 2018 (Health CBRN Plan).
- NSW Hazardous Materials / Chemical, Biological, Radiological, Nuclear Emergency Plan 2019 (HAZMAT/CBRN Sub Plan).
- NSW Lucas Heights Emergency Sub Plan 2023.
- Department of Defence, Visits to Australia by Nuclear-Powered Warships 2023 (OPSMAN 1).

Additionally, as a member state of the IAEA, Australia can be requested to render technical assistance through the IAEA Response and Assistance Network (RANET).

2.3. ANSTO RNEPR Competencies

ANSTO's capabilities are derived from over 70 years of safe operation of nuclear technology, including research reactors, radiopharmaceutical production, and associated nuclear fuel cycle activities. ANSTO maintains contemporary competency in areas of:

- Nuclear Safety.
- Radiation Protection.
- Radiological and Nuclear Preparedness and Response (RNEPR).
- Radioactive Waste Management.
- Transport of Radioactive Materials.
- Holistic Work Health and Safety.
- Human Health Monitoring.
- Environmental Monitoring.

2.4. ANSTO Functional Capabilities

ANSTO maintains functional capabilities for Radiological and Nuclear Emergency Preparedness and Response (RNEPR) for safety or security initiators in the following areas:

- Nuclear installation assessment and advice.
- Source search and recovery.
- Radiation survey, sampling, and analysis.

- Radiological assessment and advice.
- Decontamination
- Medical support.
- Nuclear Forensics and crime scene management
- Radiation detection and imaging.
- Dose assessment

ANSTO is the only provider of Whole-Body Monitoring for radioactivity in the body in Australia.

2.5. ANSTO Training for RNEPR

ANSTO operates Australia's only Radiological and Nuclear Emergency Preparedness and Response training course at a nuclear installation. This course establishes the baseline first responder competencies for response to nuclear or radiological emergency situations from safety and security-related initiators.

Course participants gain experience in applying the AIIMS model in the following live agent scenarios:

- Radiological exposure device (RED) search and recovery practical exercise.
- Radiological dispersal device (RDD) incident practical exercise.
- Radioactive airborne release from reactor accident practical exercise.
- Nuclear forensics radiological crime scene management.

These exercises allow radiological field assistance teams to practice radiation measurement, assessment, and decision-making skills within the safety envelope of experienced ANSTO radiation protection practitioners.

2.6. ANSTO Science and Technology Supports RNEPR

Under the Department of Defence OPSMAN 1, the Royal Australian Navy (RAN) with ANSTO assistance, has responsibility for developing and maintaining specific training for personnel engaged in support of nuclear-powered ship visits. ANSTO fulfills its obligations through the provision of an appropriately qualified and experienced Health Physicist responsible for advising the State / Territory Radiation Safety Officer (SRO / TRO) during visits by nuclear powered ships on:

- Functional status of monitoring equipment.
- Pre-visit Radiation Monitoring Group (RMG) exercising.
- Readiness status of Radiation Monitoring Group personnel and equipment.
- Radiation monitoring pattern.
- Results of radiation monitoring that may affect the public.
- Protective actions that should be taken or considered.

This collaborative effort between RAN, ANSTO, State/Territory Radiation Authorities, and Emergency Service Organisations enables first responders to prepare, protect, and respond.

3. Opportunity for Reform - Commonwealth Longer-Term Capabilities and Capacities needed for the Evolving Strategic Environment

3.1. ANSTO Science and Technology Supports RNEPR

State and Territories have primary responsibility for developing and maintaining specific training for personnel engaged in support of radiological or nuclear incidents.

Longer term capabilities and capacities needed for the evolving strategic environment include:

RNEPR Monitoring Competencies:

- Functional status of monitoring equipment.
- Radiation monitoring drills and exercises.
- Radiation monitoring pattern.
- Results of radiation monitoring that may affect the public.
- Protective actions that should be taken or considered.

RNEPR Functional Competencies:

- Radiological and Nuclear Preparedness and Response.
- Radiation Protection.
- Nuclear Safety.
- Radioactive Waste Management.
- Transport of Radioactive Materials.
- Holistic Work Health and Safety
- Human Health Monitoring.

RNEPR Functional Capabilities:

- Nuclear installation assessment and advice.
- Source search and recovery.
- Radiation survey, sampling, and analysis.
- Radiological assessment and advice.
- Decontamination
- Medical support.
- Nuclear Forensics and crime scene management
- Radiation detection and imaging.
- Dose assessment

4. Opportunity for Reform - Commonwealth RNEPR Challenges for Competing and Concurrent Crises

The Australian Disaster Preparedness Framework (HA, 2018) describes a national disaster preparedness capability as the collective ability of governments, the community, non-government organisations, the private sector and international support to manage the risks and address the consequences of a severe to catastrophic disaster.

Australian organisations have excellent preparedness, response, and recovery capabilities, however, as the 2023 Western Australia source search and recovery incident demonstrated, no single organisation can manage the entire radiological or nuclear National Disaster Management and Recovery Continuum.

Current state:

Australian Defence Force (ADF) Defence Assistance to the Civil Community (DACC) provides means through which the Commonwealth can assist State and Territory Governments (DOD, 2023) in Radiological or Nuclear Emergency Preparedness and Response.

Future state:

The National Emergency Management Agency Alternative Commonwealth Capabilities Discussion Paper for Crises Response proposes Australian Defence Force (ADF) Defence Assistance to the Civil Community (DACC) as a capability of last resort for State and Territory Governments (NEMA, 2023).

Pressure point 1: Capability

The capabilities and roles of ANSTO teams are consistent with the requirements of the International Atomic Energy Agency (IAEA) Response Assistance Network (RANET) capabilities.

Pressure point 2: Capacity

Under Department of Defence OPSMAN 1, ANSTO is required to provide up to twelve suitably qualified and experienced radiation monitoring group responders and holistic safety liaison support for a single nuclear powered warship incident within 12 hours.

While ANSTO RNEPR capability is scalable, growing this capability takes time and employing concurrent capability across multiple crises could be challenging under current arrangements.

Pressure point 3: Enhance and Develop Capabilities

We need experienced nuclear facility radiation protection experts to assist with emergency response:

- Fear and lack of familiarity about radiation add complexity and uncertainty to decisions and operations.
- Responders do not routinely respond to radiological or nuclear emergencies and may lack radiological monitoring skills to support an emergency.

Pressure point 4: Foster Partnerships, Plan & Coordinate Capabilities

The role of ANSTO as trusted advisor for nuclear science and technology is determined by national arrangements. It can range from performing radiological or nuclear training and accreditation, performing a technical action requested by a regulatory body to full involvement in state, territory and national Emergency Preparedness and Response (EPR) plans.

5. Opportunity for Reform: ADF Alternative RNEPR Options

5.1. Option 1: Do nothing

This option does not increase Commonwealth Australian Defence Force (ADF) alternative capability for crisis response in the civil community.

5.2. Option 2: Capability and Safety

The role of ANSTO as trusted advisor for nuclear science and technology is determined by national arrangements. It can range from performing radiological or nuclear training and accreditation, performing a technical action requested by a regulatory body to full involvement in state, territory and national Emergency Preparedness and Response (EPR) plans.

RNEPR Monitoring Competencies:

- Functional status of monitoring equipment.
- Radiation monitoring drills and exercises.
- Radiation monitoring pattern.
- Results of radiation monitoring that may affect the public.
- Protective actions that should be taken or considered.

Each of the National, State and Territory plans which include ANSTO sets expectation for suitably qualified and experienced ANSTO responders to support an incident. Under Department of Defence OPSMAN 1, ANSTO is required to provide twelve radiation monitoring group responders and holistic safety liaison support for a single nuclear powered warship incident within 12 hours. While ANSTO capability is scalable, growing the capacity to support multiple incidents at different geographic locations takes time and represents a challenge under current arrangements.

5.3. Option 3: Full Scope

This option will provide the scope elements under option 2, plus additional items listed below:

RNEPR Functional Capabilities:

- Nuclear installation assessment and advice.
- Source search and recovery.
- Radiation survey, sampling, and analysis.
- Radiological assessment and advice.
- Decontamination
- Medical support.
- Nuclear Forensics and crime scene management
- Radiation detection and imaging.
- Dose assessment

RNEPR Functional Competencies:

- Radiological and Nuclear Preparedness and Response.
- Radiation Protection.
- Nuclear Safety.
- Radioactive Waste Management.
- Transport of Radioactive Materials.
- Holistic Work Health and Safety
- Human Health Monitoring.

ANSTO can assist the Commonwealth establish workforce RNEPR surge capability and capacity through Radiological or Nuclear Emergency Response Capability training and technology.

6. Opportunity for Reform: Alternative RNEPR Models for Commonwealth Consideration

6.1. United States of America: Federal Emergency Management Agency CBRN office

The Federal Emergency Management Agency's (FEMA) mission is helping people before, during and after disasters. Following public misconception that radioactive fallout from the Fukushima Daiichi nuclear power plant could impact the United States west coast, the FEMA CBRN office contacted the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) – DHS's research arm – for assistance.

This collaborative effort between FEMA and S&T laboratories supports first responders to prepare, protect and respond through science and technology programs including:

- Radiological Operations Support Specialist (ROSS).
- Rad Responder.
- Responder Training and Exercise (RTE).
- Test and Evaluation (T&E).
- Research and Development (R&D).
- Community Emergency Response Team (CERT).

6.2. United Kingdom: Health Security Agency Radiation Emergency Preparedness Service

The UK Health Security Agency (UKHSA) is the UK's primary authority carrying out research to advance knowledge about protection from the risks of radiation. Their Radiation Emergency Preparedness Service provides a range of radiation emergency related consultancy, training and research and development services to government, industry, and others.

UKHSA's Radiation Emergency Preparedness Service offers experience in preparing for and responding to radiation emergencies and sits on numerous national committees influencing national policy. UKHSA Radiation Emergency Preparedness Service undertakes the following activities:

- Contributes to national plans for radiation and nuclear emergencies.
- Provides support to government departments and other national and local agencies in preparing, conducting, participating in, and learning lessons from, emergency exercises.
- Participates in research and development related to facilities, techniques, and studies to support radiation emergency planning and response.
- Provides and participate in a range of training courses for staff of organisations with a role to play in radiation and nuclear emergencies.
- Participates in nuclear emergency exercises and contribute to government reviews of emergency arrangements following terrorist attacks.

7. Opportunity for Reform: Commonwealth Workforce Surge

The Australian Public Service (APS) surge reserve offers an established and mature surge capacity to support resilience of Commonwealth capability. Australian organisations have excellent preparedness, response, and recovery capabilities however, as the 2023 Western Australia source search and recovery incident demonstrated, no single organisation can manage the entire radiological or nuclear National Disaster Management and Recovery Continuum.

Australian State and Territory government health agencies involved in managing or supporting RNEPR could include, amongst others:

- Department of Health (DoH).
- Department of Climate Change, Energy, the Environment, and Water (DCCEEW)
- Australian Radiological Protection and Nuclear Safety Agency (ARPANSA)
- Australian Nuclear Science and Technology Organisation (ANSTO).
- National Critical Care and Trauma Response Centre (NCCTRC).
- Australian Medical Assistance Team (AUSMAT).
- Disaster Assistance Response Team (DART).
- Australian Federal Police (AFP)

RNEPR capability replicated in a scalable, efficient, and effective way through training in radiological or nuclear safety capability could include:

- ANSTO Radiological or Nuclear Emergency Preparedness and Response.
- ANSTO Advanced Radiation Safety Officer.
- Nuclear forensics radiological crime scene management.

APS surge volunteers would be required to meet mandatory requirements to:

- Be physically fit and meet required medical standards for deployment.
- Be over 18 years of age.
- Be able to deploy at short notice for a period of up to 14 days, including the ability to be at departure airport within 12 hours of activation.
- Participate in initial training and progress training for volunteer specialists.
- Be able to work at heights and in confined spaces.
- Complete in person and online training modules as required to meet team requirements.
- Be able to obtain a current first aid and CPR certificate.
- Have an Australian passport.

7.1. Capabilities needed for Commonwealth Workforce RNEPR Surge

RNEPR Monitoring Competencies:

- Functional status of monitoring equipment.
- Radiation monitoring drills and exercises.
- Radiation monitoring pattern.
- Results of radiation monitoring that may affect the public.
- Protective actions that should be taken or considered.

RNEPR Functional Capabilities:

- Nuclear installation assessment and advice.
- Source search and recovery.
- Radiation survey, sampling, and analysis.
- Radiological assessment and advice.
- Decontamination and medical support.
- Dose assessment.
- Nuclear Security Science: nuclear forensics and radiation detection and imaging.

RNEPR Functional Competencies:

- Radiological and Nuclear Preparedness and Response.
- Radiation Protection.
- Nuclear Safety.
- Radioactive Waste Management.
- Transport of Radioactive Materials.
- Holistic Work Health and Safety
- Human Health Monitoring.

ANSTO can assist the Commonwealth establish workforce RNEPR surge capability and capacity through Radiological or Nuclear Emergency Response Capability training.

8. Opportunity for Reform: Volunteers

The Australian State or Territory Emergency Service (SES / NTES) volunteers are the first responders to emergencies. They provide assistance in emergency situations including flood, storm, bush search and rescue and give relief to those impacted (SES, 2023). With over 44,000 volunteers (SES, 2023) the State Emergency Service plays a vital role in helping communities prepare for, respond to, and recover from emergencies.

Australian organisations have excellent preparedness, response, and recovery capabilities however, as the 2023 Western Australia source search and recovery incident demonstrated, no single organisation can manage the entire radiological or nuclear National Disaster Management and Recovery Continuum.

Australian, state and territory volunteer organisations involved in managing or supporting RNEPR could include:

- State Emergency Service (SES) / Northern Territory Emergency Service (NTES)
- State and Territory Rural Fire Service volunteer
- Disaster Relief Australia volunteer
- Australian Coast Guard volunteer

RNEPR capability replicated in a scalable, efficient, and effective way through training in radiological or nuclear capability could include:

- ANSTO Radiological or Nuclear Emergency Preparedness and Response
- ANSTO Advanced Radiation Safety Officer.
- Nuclear forensics radiological crime scene management.

Volunteers would be required to meet mandatory requirements to:

- Be physically fit and meet required medical standards for deployment.
- Be over 18 years of age.
- Be able to deploy at short notice for a period of up to 14 days, including the ability to be at departure airport within 12 hours of activation.

- Participate in initial training and progress training for volunteer specialists.
- Be able to work at heights and in confined spaces.
- Complete in person and online training modules as required to meet team requirements.
- Be able to obtain a current first aid and CPR certificate.
- Have an Australian passport.

9. Opportunity for Reform: Industry and Private Sector

ANSTO has strong academic and commercial connections with all the publicly funded research organisations currently supporting the delivery of goods, services, and advice to the defence sector in Australia.

Nandin is ANSTO's Innovation Centre where science and technology entrepreneurs, startups and graduates come together, to challenge, design, innovate and commercialise, creating new jobs in the high-growth industries of tomorrow.

Nandin is the only innovation centre in New South Wales to be part of the Design Factory Global Network. Globally connected to the world's best product design centres through the network, exploring the role of design and designing thinking in the deep technology and research commercialisation space.

10. What gaps currently exist in State and Territory emergency management capability?

Australian organisations have excellent preparedness, response, and recovery capabilities, however, as the 2023 Western Australia source search and recovery incident demonstrated, no single organisation can manage the entire radiological or nuclear National Disaster Management and Recovery Continuum.

11. Future Discussion

ANSTO offers the additional support of radiation protection expertise derived from the operation of nuclear facilities for 70 years and associated emergency management infrastructure.

This additional layer of operational experience can assist the Local, State, Territory and Nationals Governments to better uplift jurisdictional radiological and nuclear preparedness and response.