

IMPLEMENTING THE CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES AUSTRALIA'S EXPERIENCE AND PROGRESS

Paper submitted by Australia in reply to Note Verbale TM-32461 of 9 February 2007

EXECUTIVE SUMMARY

Australia is a federation of six States, which, together with two major self-governing territories and the federal government comprise 9 separate legal jurisdictions. Australia has a land mass of 7,686,859 square kilometres. Australia manufactures Category 2 and 3 sealed radioactive sources but uses category 1 to 5 sealed radioactive sources for a broad range of medical, industrial and research purposes. Australia gave a non-binding commitment to work towards implementing the guidance in the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources* (consistent with the terms of GC(47)/Res/7.B) in May, 2004 and notified the IAEA Director General of its intention to act in accordance with the IAEA *Guidance on the Import and Export of Radioactive Sources* (consistent with the terms of GC(48)/Res/10.D) in November 2004.

Since Australia's report to the *International Conference on the Safety and Security of Radioactive Sources: Towards a Global System for the Continuous Control of Sources Throughout their Life Cycle* at Bordeaux in 2005:

- the Council of Australian Governments has prepared a report on the security of radioactive materials and agreed to recommendations to strengthen the security of high activity radioactive sources;
- the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), the federal government body responsible for promoting national uniformity in radiation policy and practice and regulating the federal government's use of radioactive sources, has published the *Code of Practice for the Security of Radioactive Sources*;
- Australia has established an interim national register of Category 1 and 2 radioactive sources;
- Australia has enacted legislation to ensure the safe and secure storage of radioactive materials that were intended or have been used in a malicious act;
- Australia has enhanced facilities and services to search for missing sources, secure found sources and to intervene in the event of a malicious act involving a radioactive source;
- Australia has made regulations to control the export of Category 1 and 2 radioactive sources in accordance with the IAEA Guidance (Australia has a longstanding control on the import of radioactive material).

1. INFRASTRUCTURE FOR REGULATORY CONTROL

1.1 Implementation:

Acquisition, use, storage, transfer and disposal of radioactive material in all States or territories within Australia are regulated by specialist units within either a Department of Health (4 States and 2 Territories) or an Environmental Protection Authority (2 States). The same activities at the national level are regulated by ARPANSA under the *Australian Radiation Protection and Nuclear Safety Act 1998* (the ARPANS Act) and Regulations.

The legislation across Australia is not uniform due, in the main, to the age of the enabling legislation and assorted policy issues. It is evident from a recent study that, amongst other things, the levels of penalty for illegal possession and use of radioactive material should be made uniform across Australia.

One of the functions of the CEO of ARPANSA is 'to promote uniformity of radiation protection and nuclear safety policy and practices'. The Radiation Health Committee (RHC), established under the ARPANS Act also has functions in support of national uniformity. The Committee includes the CEO of ARPANSA and representatives from each State and Territory radiation control authority.

In August 1999, a Ministerial meeting endorsed the development of a *National Directory for Radiation Protection* as a means of achieving uniformity in radiation protection practices between jurisdictions. The meeting agreed that, upon consideration and approval of the provisions of the Directory by the RHC, the regulatory elements shall be adopted in each jurisdiction as soon as possible using their existing regulatory frameworks.

The first version of the National Directory was accepted by Ministers on 29 July 2004 and by adopting the National Directory each jurisdiction then has an agreed set of terms and definitions to be embedded into legislation, thus providing a mechanism for uniform adoption of an approach to radioactive source safety.

To address the security requirements of the IAEA Code of Conduct, the Radiation Health Committee endorsed the development of a *Code of Practice for the Security of Radioactive Sources*. The intention is that version 2 of the *National Directory* will refer to this code and hence provide uniform legislated source security requirements in all jurisdictions. The Code of Practice was developed by ARPANSA in consultation with national counter-terrorism policy making and response agencies involved in coordinating the development of the Council of Australian Government's report on security of chemical, biological, radiological and nuclear materials. ARPANSA published the Code of Practice in January 2007 and it is available at <http://www.arpansa.gov.au/rps11.cfm>.

The *Code of Practice for the Security of Radioactive Sources* applies to the use, storage and transportation of Category 1 to 3 radioactive sources and sets a security outcome to be achieved for each Category by a mix of physical and procedural security measures identified using a risk informed, performance based approach. These security measures are set in a scalable manner based on the threat level and are formulated into a source security plan or source transport security plan which requires approval from the regulatory body. The Code of Practice also contains provisions regarding trustworthiness checks, regulatory requirements for the transfer or disposal of a Category 1 to 3 source and incident reporting and recordkeeping.

1.2 Lessons learned:

Categorisation for the purposes of allocating a security outcome requires consideration of factors in addition to those required for a safety categorisation.

It is not feasible to set a security outcome of 'timely response' for Category 2 and 3 radioactive sources. Other security outcomes need to be developed that enhance the prospects of rapid recovery of the sources and identify/recognise the existence of other counter terrorism measures.

While a prescriptive based approach to security regulation may unduly restrict business activity, a performance based approach requires the availability of experienced security experts or substantial performance data for security measures.

In Australia's case, source security regulation will be undertaken by regulatory bodies that have no security expertise. While effective implementation of regulation requires access to this type of expertise, there are different models for how it can be acquired and each are equally valid.

Effective implementation of a source security regulatory framework requires users and the regulatory body to have and maintain an effective security culture.

2. FACILITIES AND SERVICES AVAILABLE TO MANAGE SOURCES

2.1 Implementation:

2.1.1 Searching For Missing Sources And Securing Found Sources

In the event of a missing or uncontrolled radioactive source, current processes require the authorised person to notify the regulatory authority. In the case of theft, the local police service would also be notified. The timescales for this notification and the systems available for locating and securing missing sources varies across the regulatory jurisdictions within Australia. The Code of Practice

requires a security breach (including theft, loss, damage, unauthorised access or transfer) to be immediately reported to the local police service and to the regulatory body.

Portable vehicle mounted radiation search systems are available at the national level and commercial aerial radiometric survey systems are available and can be configured for searching for missing sources.

Consistent with a recommendation in the COAG report, ARPANSA will formalise arrangements for reporting security breaches to relevant government agencies with responsibility for intelligence, law enforcement and counter-terrorism. Arrangements are also being formalised to ensure the transmission of threat related information from these agencies to the relevant local police service and regulatory body. Existing arrangements have been revised to ensure the timely deliver of reports to the IAEA's Illicit Trafficking Database (ITDB) concerning trafficking in radioactive sources and the dissemination of reports from the ITDB to regulatory bodies.

In December 2006, the federal government enacted legislation to allow the Australian Nuclear Science and Technology Organisation (ANSTO), based in Sydney, to accept radioactive material arising from an intended or actual malicious act. ANSTO has the onsite and mobile facilities and services to condition, package and store such radioactive material.

2.1.2 Intervention In The Event Of An Accident Or Malicious Act Involving A Radioactive Source

The responsibility for emergency response and the implementation of protective measures following an accident or the malicious use of radioactive material rests with the jurisdiction in which the incident occurred in the first instance. In the event of the jurisdiction's resources being overwhelmed or the incident being identified as terrorism related, a set of federal government plans are initiated as appropriate including the National Counter Terrorism Plan. First responders now have significant training and equipment to deal with a range of CBR incidents including those involving radiation. The radiation protection framework to assist in intervention-related decisions is provided in an ARPANSA document published in December 2004: *Recommendations on Interventions in Emergency Situations Involving Radiation Exposure, RPS7*.

2.1.3 Personal Dosimetry And Environmental Monitoring; And The Calibration Of Radiation Monitoring Equipment

There are a number of suppliers of personal dosimetry for external radiation exposure and calibration services for radiation monitoring equipment within Australia. The capacity for environmental monitoring exists both for routine monitoring of facilities using radioactive materials and for radiation emergency response. Australia is developing environmental monitoring teams, with equipment and procedures, that are consistent with IAEA methods and compliant with the requirements of the IAEA ERNET.

2.2 Lessons learned:

Clarification of roles and responsibilities amongst organizations likely to be involved in searching for or intervening in a malicious act prior to an incident is critical to effective interaction and performance during an incident.

The development of the radiation emergency monitoring and the supporting radiation protection intervention framework is complex, with the elements derived from a range of guidance documents, including IAEA Safety Standards, TecDocs and training material. There is currently no "one stop shop" or roadmap, and this has slowed progress.

Active management of media messages and public perceptions is critical to achieving a successful outcome.

3. TRAINING: REGULATORY BODY, LAW ENFORCEMENT AGENCIES AND EMERGENCY SERVICES

3.1 Implementation:

Staff within Australian regulatory bodies have appropriate radiation protection and scientific training to ensure the safe use of radioactive materials. In implementing the Code of Practice, some regulatory bodies have or will recruit security experts, in addition, ARPANSA is in the final stages of developing a training course on protective security fundamentals and requirements for implementing the Code of Practice. Following consultation with regulatory bodies and industry, ARPANSA will identify, develop and deliver training courses on a core set of topics critical to implementation of the Code of Practice (for example 'insider threat').

As part of national programmes for CBR emergency response enhancement, law enforcement agencies, fire hazmat and ambulance service personnel have developed and delivered training on radiation emergency response in conjunction with organizations offering radiation protection training. The training varies between jurisdictions but is coordinated nationally.

3.2 Lessons learned:

Preparation of emergency personnel for radiation incident is a significant task, both due to the number of personnel and the technical nature of the training. The familiarization with radiation and radiation protection needs to occur across all levels of the response agencies, including the decision makers.

In Australia's case, the regulatory bodies with principal responsibility for security of radioactive sources are safety focused organizations. Appropriate skills and knowledge training is essential to effective implementation and monitoring of a source security regulatory framework.

4. NATIONAL REGISTER OF SOURCES

4.1 Implementation:

ARPANSA, working with the nation's other 8 radiation regulatory bodies, has established an interim national register of Category 1 and 2 radioactive sources. The register includes the following fields: radionuclide, activity level, activity level measurement date, chemical form, physical form, serial number, nature of use, manufacturer name, model details and security fields related to the source. The register also contains fields relating to the container holding the source. The register receives quarterly updates from registers in each jurisdiction. The register could also be updated on an 'as needed' basis. The register along with information communicated to/from the register is secured in an appropriate manner.

As the Australian national register matures, it will be extended to Category 3 sources for the following reasons:

1. because it is possible to accumulate Category 3 sources to have an equivalent to a Category 2 source and without adequate tracking of the Category 3 sources this accumulation may not be evident;
2. the chemical and physical composition of some sources, even at the Category 3 level, means that they may be able to be effectively used to expose humans to large doses of radiation.

When finalized, the Australian national register will present an integrated holistic picture of radioactive sources including inventory, imports, exports and domestic transfers.

4.2 Lessons learned:

Ensure clarity of the legal basis, role and responsibility of stakeholders involved with the national register. Australia has 9 separate radiation regulators each with its own register capable of keeping data on sources located within that jurisdiction. The national register presents an opportunity for these regulators to collect, contribute and receive data, however, it also requires the federal government to play a key coordination role while also maintaining the register.

Quality data (accuracy, completeness and timeliness) is critical to having a useful register.

The national register can be used to generate analysis and reports that support/reinforce effective implementation of the source security framework and the development of a security culture.

5. NATIONAL STRATEGIES: GAINING OR REGAINING CONTROL OVER SOURCES

5.1 Implementation:

Australia has a mature radiation safety regulation system with the infrastructure in place to facilitate the safe use of radioactive material. In order to address concerns that the current systems for the reporting of uncontrolled sources currently only operate within the local jurisdiction, informal national reporting arrangements are being formalised into a national source reporting system, in parallel with the development of the national register of high activity sources. This national system will formalise links with customs, law enforcement and intelligence bodies and will support initiation of federal government specialized source search teams if required.

Orphan or uncontrolled radioactive sources are uncommon but occasional instances have arisen in the past. Following the recommendations in the COAG report, ARPANSA will commence an awareness and education outreach programme to promote compliance with the Code of Practice and the local regulatory requirements for the safety and security of radioactive sources.

5.2 Lessons learned:

A national emergency hotline where reports of lost or stolen radioactive material can be made is being developed which, when combined with existing reporting arrangements, will ensure that relevant information is being and is capable of being communicated in a consistent and predictable manner to stakeholders.

6. MANAGING END OF LIFE CYCLE SOURCES

6.1 Implementation:

ANSTO is the only organisation in Australia that manufactures sealed radioactive sources and all such sources are able to be returned to ANSTO at the end of their useful life. ANSTO is not able to store radioactive sources of other origins. ANSTO is required to account for its inventory of manufactured radioactive material to ARPANSA, as the regulatory body, on a quarterly basis. In some instances, disused sources have been returned to overseas manufacturers in accordance with the IAEA Code of Conduct.

Some States and territories do allow individuals to re-seal used radioactive sources that are then useful to industry. This recycling of unwanted radioactive sources reduces the amount of radioactive waste stored in Australia. The manufacture and recycling of radioactive sources is controlled in Australia under the existing radiation safety legislation which typically requires a specific licence allowing such activity.

6.2 Lessons learned:

Only one State has an ultimate disposal option for radioactive sources; all other States and territories, and the Australian Government, rely on some form of storage. Thus disused and unwanted radioactive sources are stored in numerous locations. The condition of these stores, the knowledge of their contents, and the risks associated with their location and security status vary widely. It is agreed that the storage of radioactive sources is an issue that needs to be systematically addressed across Australia to ensure that, amongst other things, adequate security provisions exist.

Under the source categorisation adopted by the IAEA in its Code of Conduct, the accumulation of many small sources is to be regarded as being equivalent to a single (larger) source for security purposes. Thus many radioactive waste stores throughout Australia may require higher levels of security than currently provided using this accumulation rule.

Australian jurisdictions are taking steps to ensure that adequate inventories of radioactive waste exist, that proper waste stores are constructed in each jurisdiction, and comprehensive waste management plans are prepared and implemented to ensure the number of radioactive sources available for malicious use is minimised.

The record keeping and reporting requirements associated with the manufacture and re-cycling of radioactive sources in Australia needs to be made uniform. Although relatively well controlled within each jurisdiction, the control of radioactive sources as they move across State and Territory borders, or into the jurisdiction of the Commonwealth, varies markedly.

7. IMPORT AND EXPORT OF SOURCES

7.1 Implementation:

Radiation protection legislation in all jurisdictions prohibits a person from receiving and possessing radioactive material without prior authorisation from the regulatory body. In Australia, an authorisation from the regulatory body does not include the right to import or export radioactive material. Under Australian customs law, a person intending to import or export high activity radioactive sources requires prior permission. While the import control is longstanding, the export control came into force on 31 December 2005. Since 1 January 2005, Australia has issued 20 permits for the export of 25 high activity radioactive sources and 70 permits for the import of 140 high activity radioactive sources.

7.2 Lessons learned:

Procedures in the IAEA Code of Conduct and the Guidance require information and types of expertise and resources not usually found in a regulatory body responsible for radiation safety. The Code of Conduct has required the regulatory body to form partnerships with other government bodies in order to follow the procedures.

As early as practicable, a country should identify the countries with whom it trades sources and initiate a dialogue in order to minimise administrative or technical misunderstandings or oversights in the implementation of the guidance in the Code and Guidance.

Acting in accordance with the IAEA Guidance on the Import and Export of Radioactive Sources can have a significant impact on business, particularly in terms of the time required to assess applications. This impact could be reduced through an education and awareness outreach program by the regulatory body.

It is important to link records relating to the transfer of sources to the national register mentioned in the Code in order to clarify which sources should be under regulatory control in a particular jurisdiction.