AUSTRALIAN RADIATION PROTECTION AND NUCLEAR SAFETY AGENCY

ARPANSA

Regulatory Impact Statement for Proposed Code of Practice for the Safe Transport of Radioactive Material

This draft Code of Practice in the ARPANSA Radiation Protection Series has been developed by a working group of the Radiation Health Committee

Comment on the Draft Code of Practice for the Safe Transport of Radioactive Material should be forwarded by close of business on Monday 28 May 2001 to:

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BACKGROUND & ISSUES

Transport of radioactive materials has the potential for release of radioactive materials into the public arena and is therefore recognised as a potentially hazardous activity. The sources involved, particularly those of the higher activity used for gamma sterilisation, radiation therapy and in nuclear reactors could, if transported improperly or if involved in a serious accident without appropriate packaging, cause significant radiation exposure leading to radiation injury. A high degree of safety therefore needs to be engineered into transport packages and an easily recognisable, uniform method of package and vehicle identification needs to be employed by carriers of radioactive materials to ensure that any risk is small.

The 1990 Code, as did the 1982 Code, incorporated the most recently available International Atomic Energy Agency's (IAEA) ***Regulations for the Safe Transport of Radioactive Material***. For the 1990 Code, the most recent IAEA Regulations were the 1985 Edition incorporating the 1988 Supplement.

The IAEA Transport Regulations were first published in 1961 and there have been five comprehensive revisions since (1964, 1967, 1973, 1985 and 1996) following consultation with Member States (of which Australia is one) and other international organisations. These regulations have become recognised throughout the world as the uniform basis for both national and international transport safety requirements in this area. The first IAEA Transport Regulations formally adopted in Australia by a Code of Practice were those in the 1973 Revised Edition (as amended). These Regulations were the basis of the 1982 Code, the predecessor of the 1990 Code.

The Regulations establish standards of safety with the purpose of providing an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment associated with the transport of radioactive material. With the worldwide adoption of the 1996 Edition (revised 2000) of the regulations for all modes of transport, a continued uniform very high standard of safety in the transport of radioactive material will be achieved.

In summary, the changes to the 1985 IAEA Regulations reflected in the 1996 IAEA Regulations include:

- the introduction of a more robustly designed package type, called a Type C package, for high-activity packages transported by aircraft;
- the introduction of a material category known as "low dispersible radioactive material" (LDM) to complement Type C packaging;
- provisions for the safe transport of uranium hexafluoride including packaging testing criteria;
- incorporation of the exemption values from the ***International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources (BSS);***
- revisions to the requirements applicable to fissile materials;
- consideration of accident conditions such as crush and the Type C test conditions;
- changes to the package activity limits for some radionuclides. Of the 400 isotopes listed, approximately 50% of the activity values for special form radioactive material (A_1 values)

remain unchanged and about one third retain the same activity value for radioactive material other than special form (A_2 values). About one quarter have lower values of A_1 in the 1996 Regulations while about 40% have higher values. One quarter have lower A_2 values in the 1996 Regulations and about 50% have higher A_2 values.

- inclusion of a requirement that a Radiation Protection Program be established for the transport of radioactive material.

Australia imports radioisotopes that equate to approximately 2500 transports per annum, mainly from the United States and the United Kingdom. Exports number some 10,000 per year and these exports are primarily to the Pacific region including New Zealand and South-East Asia. Most, if not all, of Australia's trading partners in relation to radioactive material are Member States of the IAEA and as such will have adopted the 1996 Regulations at some stage. However, as international air and sea carriers will adopt the Regulations on 1 July 2001, all movements of radioactive material to and from Australia will need to comply as of that date regardless of whether the trading partner is a Member State or not.

The majority of imports and exports of radioactive material to and from Australia are of a medical nature and would generally involve relatively small amounts of radioactive material. Each year, however, there are several transports involving high radioactivity sources used for radiation therapy and for gamma sterilisation of medical and non-medical products where, although the risk of accident is low, the consequences in the event of an accident are potentially high.

There are also infrequent transports of spent fuel from the research reactor at Lucas Heights in New South Wales for reprocessing overseas. Furthermore, if the proposal for the replacement research reactor goes ahead as scheduled, there will also be import of fuel during the lifetime of the proposed Code of Practice.

There have been several prosecutions in various jurisdictions for failures to comply with provisions of the current Code of Practice. These have usually involved failures to properly label packages, using the wrong class of package, failure to placard vehicles or failure to properly document shipments.

Where damage to a package has resulted from a transport accident, this has invariably not led to the release of radioactive material thus supporting the fact that the packaging has provided a satisfactory level of protection. Even with this level of safety, the proposed Code provides improvements over the current Code in the areas outlined the summary of changes listed above.

PROBLEM

The uncontrolled transport of radioactive material represents a risk of radiation exposure and injury to transport workers and the public, and represents a risk of contamination of the environment.

Transport of radioactive material by means inconsistent with international requirements would also present difficulties for Australian exporters in arranging shipments.

The current controls (the 1990 Australian Code of Practice) for transport of radioactive materials, while still providing for a high degree of safety, have now become dated in some

areas. In light of the current knowledge of the risk of exposure to radiation, some packaging controls need to be tightened, whereas, other packaging controls can now be relaxed.

OBJECTIVE

1. The objective of this Code of Practice is to protect persons, property and the environment from the effects of radiation during the transport of radioactive material.

2. The secondary objective of the Code of Practice is to achieve internationally uniform packaging, labelling and documentation of radioactive consignments thus ensuring that radioactive material can be imported and exported to and from Australia without impediment.

POSSIBLE OPTIONS

OPTION 1
Maintain the status quo

The changes occurring internationally could be ignored and the 1990 Code be maintained as the requirements for Australia.

OPTION 2
Direct adoption of the 1996 IAEA Regulations (as revised 2000) without an Australian Code

The 1996 IAEA regulations could be adopted directly by State, Territory and Commonwealth regulators without the development of an Australian Code.

OPTION 3
Code of Practice (incorporating the IAEA Regulations for the Safe Transport of Radioactive Material 1996, as revised 2000)

An Australian Code could be developed to adopt the 1996 IAEA regulations and include any modifications to the Code that would facilitate efficient application in the Australian situation. Such modifications would include details of Australian competent authorities for transport, details of the most recent dose limitation as applicable to Australia and amendments to the IAEA Regulations that would result in unnecessary regulation of material that would be otherwise classed as radioactive. It is intended that an Australian Code would be uniformly adopted by all State, Territory and Commonwealth radiation protection regulators.

IDENTIFYING AFFECTED PARTIES

Parties likely to be affected by the proposal include transport companies and workers, suppliers of radioactive sources and equipment (eg industrial radiography equipment, radiation gauges, medical isotopes, research isotopes), users of radioactive materials (eg industries, universities and medical facilities), Government regulators (State, Territory and Commonwealth), and the community.

IMPACT ANALYSIS

OPTION 1
Maintain the status quo

Benefits

There would be a short-term cost benefit to both Government and industry in maintaining the *status quo*. These cost benefits would result from:

- not having to print new Codes;
- not having to obtain copies of the 1996 IAEA Regulations;
- not needing to retrain regulatory enforcement personnel in new requirements;
- not needing to consult with and advise key stakeholders about changes to legislation; and
- avoiding the costs associated with legislative change.

A secondary benefit would arise from the familiarity that stakeholders would have with requirements that have been in place for over a decade.

Costs

If the 1990 Code were not replaced, there could be serious implications for international trade between Australia and other countries who have already adopted the 1996 Regulations. For instance, other countries might not accept material packaged under the 1990 Code criteria, particularly items such as high activity sources transported by air.

These changes to package activity limits for some isotopes could result in imported sources being "incorrectly" packaged in relation to the 1990 Code requirements. Likewise, Australia may export radioactive sources in inappropriate packages (eg. in a Type A package where a Type B(U) would be needed). Other problems that may be experienced by maintaining the *status quo* could include:

(a) prevalence of packaging that would not meet the most up-to-date international standards (including packing radioactive sources in inappropriate containers);

(b) failures in appropriate radiation protection procedures due to radiation protection programs inconsistent with international transport requirements, resulting in people handling radioactive consignments without an appropriate level of knowledge of how to do so safely;

(c) overloading of vehicles resulting in consignments where the total dose rate could be unacceptably high (currently restricted by the total of the transport indices of the consignment – the transport index is related to the dose rate at 1 metre from the surface of a package, overpack or freight container).

It would be difficult to quantify the difference in collective dose (a measure of the total radiation exposure of a population obtained by summing the individual doses) to persons handling radioactive consignments in Australia that would arise from maintaining the 1990 Code. Codes with similar packaging, handling, documentation and labelling requirements to the 1996 IAEA Regulations have been in place in Australia for 17 years. The dose limitation philosophy in the 1990 Code, however, predates the dose limits recommended by the International Commission on Radiological Protection (ICRP) in its publication 60 [ICRP, 1991] as adopted in Radiation Health Series 39. As ICRP 60 prescribed lower dose limits for occupationally exposed

persons and the public, maintenance of the 1990 Code might result in an upward trend in collective dose over time.

Further, option 1 would not encompass international best practice as it does not provide for adoption of up-to-date international recommendations.

OPTION 2

Direct adoption of the 1996 IAEA Regulations without an Australian Code

Benefits

This option has the advantage of being consistent with international transport requirements resulting in a benefit to Australian importers and exporters.

There is also a short-term cost benefit to Government with this option in not having to prepare and print an Australian Code of Practice.

Improved packaging of radioactive material as prescribed in the 1996 IAEA Regulations has the additional benefit of reducing the risk of contamination of the environment.

Transport of radioactive materials, by its very nature, requires a high degree of uniformity from both a national and international standpoint. Without appropriate uniform international requirements and recommendations, substandard packaging of radioactive consignments and inconsistent package labelling could result in handlers receiving avoidable doses of radiation. Adoption of the IAEA regulations would ensure that packages transported in Australia originating from here in Australia as well as countries who are also member States of the IAEA would be packaged and labelled uniformly. Consequently, handlers of radioactive packages would be aware, to the maximum extent possible, of the risk involved with any given radioactive consignment.

The 1996 IAEA Regulations cover:

- General provisions of transport including radiation protection programs, emergency response, quality and compliance assurance and special arrangement;
- Contents Limits for Packages;
- Requirements and Controls for Transport;
- Requirements for radioactive materials and for packagings and packages;
- Test procedures;
- Approval and administrative requirements; and
- Schedules of requirements for the transport of specified types of radioactive material requirements.

As technology in the transport industry advances, it is important that legislative bodies keep abreast of the changes to ensure that unsafe practices or hardware are not imposed upon society as a whole. The 1996 IAEA Regulations (as revised in 2000) have attempted to do this. The introduction of a transport package able to carry high activity sources but designed to withstand aircraft accidents is an important innovation that would reduce the risk to emergency personnel or the public in the event of an aircraft crash.

Further, uranium hexafluoride, a material for which chemical toxicity is generally of more concern than its radiotoxicity and which is routinely shipped in large volumes overseas, has now been given special packaging consideration in the international requirements for the first time. Packaging to the requirements specified in the Regulations would result in reduced risk to packagers, handlers and carriers alike. However, as uranium hexafluoride is not currently transported in Australia, this clause has no immediate impact in the Australian situation.

By adopting the approach of the IAEA *International Basic Safety Standards for Protection Against ionizing Radiation and the Safety of Sources* to the definition of radioactive material, the package limits for given radionuclides have been reassessed in the 1996 IAEA Regulations. This assists in reducing the risk to those handling or carrying radioactive transports by ensuring that the package design is appropriate for the level of hazard of the contents.

A large proportion of transports of radioactive materials in Australia relates to transports of medical radioisotopes to hospitals and private practices. Implementing either Option 2 or Option 3 would not have a significant impact on the transport of this material as the majority of medical radioisotopes are transported in Type A packages, for which the requirements are substantially the same. The changes to package limits also have no impact on medical radioisotope transports as the activity levels of materials transported are such that no change in the type of packaging would be necessary.

Costs

The 1996 IAEA Regulations do not have any reference to Australian conditions or situations and, as such, do not outline the competent authority within Australia. This is an important consideration as there are eleven competent authorities within Australia, each of who have authority over transport of radioactive material within their jurisdiction.

Although individual States, Territories and the Commonwealth would still maintain the competent authority responsibilities within their own jurisdiction, such a method of adopting the 1996 IAEA Regulations (as revised in 2000) could result in a lack of uniformity of their application between the jurisdictions. This was evidenced by the method in which the States and Territories adopted the 1990 Code of Practice. Each jurisdiction adopted the Code slightly differently, some adopting it *in toto*, others specifying paragraphs to be complied with by consignors and carriers. This led to subtle differences between jurisdictions even given though it was an Australian Code of Practice.

A problem exists in the international requirements in defining exemption limits for material that contains low levels of naturally occurring radionuclides (eg washed sands and tailings from alumina mining – see paragraph 107(e) of the 1996 IAEA Regulations). If the IAEA requirements were adopted directly, the requirements would be applied to enormous quantities of material that present a very low hazard, introducing the practical inconvenience of regulating large quantities of material with naturally occurring low activity concentration and significant cost to exporters and suppliers of such materials. There is also a cost to Government in regulating the transport of this material. Individual State, Territory or Commonwealth regulators could individually choose to implement such a modification, however, such an approach could once again lead to a lack of uniformity in requirements throughout Australia.

Australian Regulators have reported that the industries who would be affected by paragraph 107(e) are unhappy that they would be required to comply with the IAEA Regulations where they previously did not, arguing that compliance with such a requirement would have a significant cost to their business. Since producing the 1996 Regulations, the IAEA has drafted a clarification of this paragraph. In addition, Australia has proposed an amendment to the Regulations to the IAEA but until this is incorporated, the 1996 Regulations as they stand are the requirements that will be adopted internationally for air and sea transport on 1 July 2001.

With the introduction of any new legislation, the regulators themselves require some retraining and familiarisation with the legislation. As the 1996 IAEA Regulations are an improvement on the previous version (the 1985 Regulations) and not a totally new set of requirements however, this cost would be expected to be small.

OPTION 3
Code of Practice (incorporating the IAEA Regulations for the Safe Transport of Radioactive Materials 1996)

Benefits

An Australian Code of Practice that empowers the 1996 IAEA Regulations (as revised in 2000) would give clear guidance to consignors and carriers of radioactive materials of their obligations within Australian jurisdictions. By identifying the paragraphs that consignors and carriers need to comply with, it avoids the potential for lack of uniformity in interpretation across Australia. This format is new to the proposed Code of Practice and was included to overcome the subtle variations in the method of adoption of the current Code of Practice within different jurisdictions.

As the proposed Code of Practice incorporates the 1996 IAEA Regulations, the benefits outlined for Option 2 would also apply for this Option. Similar to Option 2, the improved packaging of radioactive material over that prescribed in the existing Code of Practice would have the additional benefit of reducing the risk of contamination of the environment. This option also has the advantage of being consistent with international transport requirements resulting in a benefit to Australian importers and exporters.

There is however, one area where the definition of radioactive material adopted in the 1996 IAEA regulations has been found to be unsatisfactory. This is in relation to material that contains low levels of naturally occurring radionuclides (eg washed sands and tailings from alumina mining). To redress this problem, the proposed Code of Practice includes a modification to paragraph 107(e) of the IAEA Regulations. Without this modification, the 1996 IAEA Regulations would apply to enormous quantities of material that present a very low hazard. The modification is based on IAEA advice produced since the 1996 Regulations to clarify this issue and is considered necessary to provide an appropriate balance between the radiological protection concerns and the practical inconvenience, and associated costs, of regulating large quantities of material with naturally occurring low activity concentration. Given that the problem with paragraph 107(e) has been recognised and is the subject of further clarification by IAEA, and a change to the IAEA regulations is proposed, trade implications by adopting this modification by way of a Code of Practice should be limited. Trade would most likely be affected if the modification were not adopted, as there would be a significantly reduced market for material classed as radioactive. It is expected that the affected industries would be likely to support the proposed modification to the paragraph.

By revising the packaging requirements as outlined in the impact analysis of Option 2, a higher degree of protection is afforded in normal handling situations as well as accidents. As accidents may involve people who are not familiar with the risks involved with radiation exposure, such as first aiders or members of the public, it is important that safety is engineered into the transport packages.

A Code of Practice would also include reference to Australia's most recent radiation protection standards that, in turn, incorporate the most recent international radiation protection guidelines. As already noted in Option 1, the 1990 Code of Practice predates the dose limits recommended by ICRP 60. As a result, the protection afforded to occupationally exposed persons, the public and the environment by the 1990 Code of Practice (Annex 2(c)) is, in effect, in conflict with the legislation of each Australian jurisdiction. A combination of the international transport regulations with international radiation protection principles would ensure that transport of radioactive material in Australia takes place with minimum risk to transport workers, the public and the environment.

A large proportion of transports of radioactive materials in Australia relates to transports of medical radioisotopes to hospitals and private practices. Implementing either Option 2 or Option 3 would not have a significant impact on the transport of this material as the majority of medical radioisotopes are transported in Type A packages, for which the requirements are substantially the same. The changes to package limits also have no impact on medical radioisotope transports as the activity levels of materials transported are such that no change in the type of packaging would be necessary.

A major advantage of implementing a new Code (Option 3) would be the consistency with international requirements. This would ensure that Australian companies dealing with overseas companies would not need to change packaging just to export or import radioactive material, thus removing any potential impediment to trade resulting from different packaging and labelling requirements in other countries. Government and the public would also have the reassurance that transport of radioactive material in Australia was meeting international standards.

An agreed Australian Code of Practice that incorporates the 1996 IAEA Regulations (as revised in 2000) would result in uniform adoption of international requirements resulting in less confusion, frustration and, ultimately, cost for stakeholders. A secondary benefit would be the availability of the Code of Practice for all stakeholders.

Costs

The most obvious potential costs of implementing a new Code would be to any company transporting radioactive material on a regular basis (eg. contract transport companies, industrial radiography companies, borehole logging companies, sales companies etc.). Costs would be incurred where, as a result in changes to the package limit values for some radionuclides, more secure transport containers, ie. Type B(U) container, would be required where previously a Type A container would have sufficed. A type B(U) container requires rigorous fire, drop, pressure and puncture testing before it can be certified for use. This type of testing, albeit often on a design prototype, can run into tens of thousands of dollars taking design costs into account. International hiring of type B(U) containers is also expensive and can cost thousands of dollars per transport depending on the source to be transported. On the other hand, a type A container is relatively cheap to design and fabricate and can often be made at the consignor's premises.

These costs would, however, be offset by changes to the package limit values that allow Type A rather than Type B(U) containers for other radionuclides. Where there are changes to the package activity limits specified in the 1996 IAEA Regulations, however, the majority are more lenient (that is, higher) in comparison to those prescribed in the 1990 Code of Practice (see discussion for Option 1). As a result, it is more likely that a company consigning radioactive material for transport would face reduced packaging costs. This is illustrated by the changes to the package limits for the main isotopes used for industrial radiography (cobalt-60, iridium-192, ytterbium-169 and caesium-137). Other than for non-special form ytterbium-169, the package limits in the proposed Code are either equal to or higher than those specified in the 1990 Code and, as such, the cost incurred by the industrial radiography industry would be small. Similarly for borehole logging companies, the package limits for caesium-137 and americium-241 (Am241/Be) are either equal to or higher than those in the 1990 Code and so may result in lower costs.

Given these factors, it is unlikely that the public would see the cost of any products or services go up or down as a result of implementing Option 3.

Other costs to the transport industry would be incurred as a result of setting up radiation protection programs. While the costs of running such a program would be relatively easy for a given company to determine (training cost per person, down time etc), the benefits are difficult to quantify. The long term advantages of training and education throughout all industry are however, well established. Paragraph 301 of the 1996 IAEA Regulations states that the nature and extent of a radiation protection program must be related to the magnitude and likelihood of radiation exposures. As such, any cost of a radiation protection program would be offset by the benefit of increased safety awareness of the transport industry in general and transport workers in particular. In turn, this awareness would lead to a reduction in the potential for accidents or radiation exposures. These benefits would also flow to the Government, the public and the environment resulting from:

- the Government having less cost involved in accident investigation and compliance activities;
- the public having a lower risk of exposure to radiation and greater confidence in the level of safety; and
- a lower likelihood of accidents leading to less potential for harm to the environment and, consequently, less expense on remediation activities.

Similar to the discussion in Option 2 regarding the retraining and familiarisation of regulators with the new legislation, any associated cost would be expected to be small due to the similarity of the new Code with previous Australian Codes of Practice.

It should be noted that most Australian regulators require attendance at a training course or other radiation safety assessment as a prerequisite for a licence to transport radioactive material within that jurisdiction. In jurisdictions where this is the case, the cost of implementing such a program would likely be cost neutral.

SUMMARY OF ANALYSIS

A summary of the analysis for each option is included in the table below:

OPTION	IMPACT ON				LIKELY NET BENEFIT/ IMPACT
	TRANSPORT INDUSTRY	CONSIGNORS, USERS OF RADIOACTIVE MATERIALS	GOVERNMENT	PUBLIC	
Option 1 (Status Quo)	Some costs in relation to implementing different requirements of local and international transports.	Significant costs in relation to export, import due to inconsistency with international requirements.	Some benefit in not having to formulate new requirements and change legislation but would engender criticism for inconsistency with current international requirements.	Potential cost in terms of increased risk if the most up to date standards are not implemented, and would also lead to a lack of public confidence in safety of transports.	Benefit: Little or no implementation costs; ongoing familiarity with requirements. Impact: Detrimental particularly for importers and exporters in all sectors due to inconsistency with the most up to date international requirements.
Option 2 (Direct adoption of IAEA)	Benefits similar to Option 3, but possible extra compliance costs due to lack of clarity related to the Australian situation.	Benefits similar to Option 3, but possible extra compliance costs due to lack of clarity related to the Australian situation. Problem in definition of naturally-occurring material would also have an impact.	Benefits similar to option 3, but possible impact in that jurisdictional issues may not be as clear if there is no Australian Code.	Benefits similar to option 3.	Benefits: Uniformity and consistency with international requirements; most recent dose limitation incorporated. Impact: some potential for lack of clarity of Australian situation and authorities; problem with naturally-occurring materials would not be resolved. Similar implementation costs to Option 3.
Option 3 (Adopt Australian Code)	Some costs in relation to radiation protection programs. Benefits in relation to uniformity and consistency with international requirements.	Some costs associated with changes to packaging requirements, but significant benefits flowing from uniform adoption within Australia and consistency with international requirements. Benefit in resolving the issue on naturally occurring radioactive material.	This option best fits the government objective, and particularly aids uniformity and international consistency.	Benefits from transports requirements being to the most up to date international requirements, thus developing increased confidence in the safety of transports.	Benefits: Uniformity of requirements throughout Australia while maintaining consistency with international requirements; greater clarity of Australian requirements; resolves naturally occurring material issue. Impacts: Mainly costs from implementing the changes from the existing Code.

CONSULTATION

The international process to develop an IAEA publication involves significant consultation with member States throughout the development and drafting of the publication. In the case of the international transport regulations, there was continuous Australian membership (over many years) of the IAEA Transport Safety Standards Committee, and its precursors, which had the responsibility for approving the 1996 Edition. The IAEA intended that users and regulators have ample opportunity to examine in detail the requirements of the 1996 edition before its adoption by countries and its implementation worldwide. IAEA published the regulations in 1996, and reprinted them with errors corrected in 2000, with the expectation that it would be adopted worldwide in 2001.

The draft Australian Code has been prepared by a working group of the Radiation Health Committee. The Radiation Health Committee includes representatives of all State, Territory and Commonwealth radiation protection regulators, a person to represent the interests of the public, a member of the Nuclear Safety Committee and two other members. Drafts have also been distributed to the Transport Competent Authorities Working Group, which in addition to radiation protection regulators, includes representatives of air and sea transport regulators. The process for development of Radiation Protection Series publications includes a period of public comment.

RECOMMENDED OPTION

Implementation of the most up-to-date international transport requirements is essential for ensuring the protection of people, property and the environment from the effects of radiation during the transport of radioactive material (objective 1). While this objective would be achieved by implementing either Option 2 or Option 3, the Australian situation has some unusual circumstances. These include many competent authorities, the transport of enormous amounts of low level natural material that would be classed as radioactive under the IAEA definition, and the adoption of ICRP recommendations on radiation exposure. Option 3 would therefore best meet this objective by providing additional information and specific modifications, particularly in relation to naturally occurring radioactive materials, which are not included in Option 2.

Implementation of an Australian Code of Practice that adopts the international transport requirements promotes uniformity within Australia while maintaining consistency of transport on an international level and is therefore important for international import and export (objective 2). Either Option 2 or Option 3 could meet this objective. Option 3 however, provides better opportunity for uniform adoption by jurisdictions and is therefore preferred.

The preferred option is Option 3 and the recommendation is therefore:

- That the Code of Practice for the Safe Transport of Radioactive Material, which incorporates the IAEA Regulations for the Safe Transport of Radioactive Material 1996 edition (as revised in 2000) be published with the recommendation that it be adopted by all jurisdictions in Australia to regulate the transport of radioactive material by road, rail and intrastate shipping.

NATIONAL COMPETITION PRINCIPLES STATEMENT

The transport of radioactive material potentially has a major impact on public health and safety. The requirements in the proposed Code include standards on packaging, documentation, and labelling, and the training of transport workers. These requirements involve transport costs.

In terms of costs and benefits the advantages are:

- Prescribing the requirements in a nationally accepted Code enables a common standard to be applied by all jurisdictions. This is an important aspect since transport necessarily involves cross-border activities.
- Members of the public can feel confident that strict standards have been set for every activity in the transport chain that carries risks to public health and safety.
- Persons and firms involved in the use of radioactive material can access a nationally accepted Code that comprehensively covers safety in the transport of radioactive material.

The disadvantages are:

- Prescriptive standards on packaging, documentation, and other activities for the safe transport of radioactive material necessarily involve compliance costs for firms (Most of these requirements have existed in previous Codes and are not new costs of the proposed Code).
- Governments incur administrative costs for their monitoring and enforcement activities (These costs also have largely existed in previous Codes).

IMPLEMENTATION AND REVIEW

The Code will be implemented through its adoption by radiation protection regulators in the States, Territories and the Commonwealth. It is also intended that it will become a referenced Code in the *National Directory for Radiation Protection*, which is being developed through the Radiation Health Committee to establish a uniform framework for radiation control in Australia. The Code will then provide a uniform basis for control of transport of radioactive material throughout Australia.

The Code will be reviewed at intervals not greater than 10 years, to ensure that it continues to provide adequate standards of protection and consistency with international requirements. In particular, it will be reviewed against any changes arising from IAEA reviews of their publications.

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