

# Action Plan for the Safety of Transport of Radioactive Material

## A. Introduction

### A.1. Background

1. The use of radioactive material necessitates its transport in the public domain and therefore careful attention needs to be paid to the safety of the public and workers involved, as well as of the environment. Many types of radioactive material and all modes of transport are involved.
2. The International Atomic Energy Agency (IAEA) has a statutory function “to establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for protection of health and minimization of danger to life and property..., and to provide for the application of these standards ... at the request of a State...” In July 1959, the United Nations Economic and Social Council (ECOSOC) requested the United Nations Secretary-General, in the light of recommendations made by its Committee of Experts, to inform the IAEA of ECOSOC’s desire that the IAEA be entrusted with the drafting of recommendations on the transport of radioactive material. Subsequent to that decision, the IAEA produced the first regulations for the safe transport of radioactive material in 1961. These regulations have been and continue to be revised as necessary to support changes in transport operations.
3. Provisions compatible with the IAEA Regulations for the Safe Transport of Radioactive Material have been adopted into domestic requirements by many IAEA Member States. In addition, the IAEA Regulations for the Safe Transport of Radioactive Material serve as the basis for the “model regulations” of ECOSOC’s Subcommittee of Experts on the Transport of Dangerous Goods, which in turn serve as the basis for the international “modal regulations” issued by the International Civil Aviation Organization (ICAO) for air transport, the International Maritime Organization (IMO) for sea transport, the United Nations Economic Commission for Europe (UNECE) for road, rail and inland waterway transport in Europe, and the Universal Postal Union (UPU) for transport by post. The Member States of these modal transport-related organizations are generally bound through various legal instruments to regulate according to the requirements of the IAEA Regulations for the Safe Transport of Radioactive Material.
4. An International Conference on the Safety of Transport of Radioactive Material (the International Conference) took place in Vienna, Austria, from 7 to 11 July 2003 to address a range of important issues associated with the safe transport of radioactive material. The International Conference was attended by 451 senior officers and scientists from 73 Member States, three co-sponsoring organizations, two co-operating organizations, and seven international professional bodies, and by three observers. It was organized by the IAEA; co-sponsored by ICAO, IMO and UPU; and convened in cooperation with the International Air Transport Association (IATA) and the International Organization for Standardization (ISO). The Summary and Findings of the International Conference’s

President were brought to the attention of the IAEA General Conference in Annex 1 to document GOV/INF/2003/15-GC(47)/INF/4.

5. On 19 September 2003, the IAEA General Conference, in resolution GC(47)RES/7.C, commended the Agency for having convened the International Conference, welcomed “the constructive discussions of the issues at the Conference and the President’s Summary and Findings”, and requested the Agency “to develop an Action Plan, in consultation with Member States and for approval by the Board, if possible in March 2004, based on the results of the Conference and within the Agency’s competence”. This Action Plan has been prepared pursuant to resolution GC(47)/RES/7.C. The findings of the International Conference and relevant parts of the General Conference resolution are reproduced in this Action Plan to provide the background to the identified actions and activities.

6. A separate Action Plan is being prepared on strengthening the international preparedness and response system for nuclear and radiological emergencies pursuant to resolution GC(47)/RES/7.A.

## **B. The International Action Plan**

### **B.1. Actions Related To Technical Issues in the Safety of Transport of Radioactive Material**

7. The Agency’s involvement in these Actions will be within the Agency’s competence.

#### **B.1.1. Regulations for the Safe Transport of Radioactive Material and Harmonization with UN and Other International Organizations**

8. The International Conference found, inter alia, that:

- *the current regulations provide a high level of safety and are implementable by Member States and industry* (section 3.3 of the Findings of the International Conference’s President<sup>1</sup>);
- *the regulatory process for transport should be sufficiently flexible to take into account the latest developments, while providing sufficient stability in the Regulations themselves* (section 3.3);
- *the current IAEA Transport Regulations provide safe packaging options for the entire spectrum of radioactive material: nuclear fuel cycle material; medical and industrial sources; naturally occurring radioactive material; and non-specification material (particularly ‘orphan’ sources). Packages for both fuel cycle and non-fuel-cycle material have been safely operated for many years throughout the world* (section 2.1);
- *relative to maritime transport, the test requirements for Type B packages (thermal test and 9-metre drop test) are based on proven science and engineering* (section 2.3);

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<sup>1</sup> The Summary and Findings of the President of the International Conference on the Safety of Transport of Radioactive Material are available on the website:

[http://www-rasanet.iaea.org/downloads/meetings/july2003\\_trans\\_saf\\_conf\\_summary\\_and\\_findings.pdf](http://www-rasanet.iaea.org/downloads/meetings/july2003_trans_saf_conf_summary_and_findings.pdf)

- *IAEA guidance provides a framework for a comprehensive strategy for anticipating and dealing with transport accidents involving radioactive material* (section 1.3); and
- by following the requirements of the IAEA Transport Regulations, the designer of a package for the transport of radioactive material strives not only to meet the requirements of the regulatory tests, but also to produce a package that is safe under all conceivable conditions (section 3.2).

9. In resolution GC(47)RES/7.C, the General Conference

- expressed satisfaction with “the progress that has been made in establishing a schedule for regular reviews of the Agency’s Transport Regulations with a view to issuing a revised or amended edition, as necessary, every two years, beginning in 2003, consistent with the schedules of the United Nations Sub-committee of Experts on the Transport of Dangerous Goods and of the relevant international modal organizations” (op. para. 11); and
- recognized that “such a record can best be maintained by continuing efforts to improve the regulatory and operational practices and ensure strict implementation of guidelines” (op. para. 3).

10. The above results provide confidence that the Regulations for the Safe Transport of Radioactive Material are of high quality. To maintain this high quality and, in particular, to take account of the latest knowledge relating to transport safety, a two-year review and, if necessary, revision of the Regulations for the Safe Transport of Radioactive Material are undertaken. Additionally, harmonization with other UN Organizations is essential for uniform application of transport safety requirements worldwide. Working closely with the UN and the Modal Organizations facilitates harmonization of requirements.

**Actions:**

- (i) The Secretariat to publish the 2003 English edition of the Agency’s Regulations forthwith and a revised or amended edition, as necessary, every two years thereafter, and expedite its translation into the official UN languages.
- (ii) The Secretariat to continue the current Agency process for the review and, if necessary, revision of the Regulations.
- (iii) The Secretariat to undertake a review of the process itself to determine what efficiencies can be made, taking account of the need for harmonization with the other International Organizations that make use of the Agency’s regulations.
- (iv) The Secretariat to consider the need for additional flexibility in the light of the broad range of materials to which the Regulations apply.

**B.1.2. Compliance Assurance, and Quality Assurance**

11. The International Conference found that *robust compliance assurance and quality assurance programmes are essential foundation stones in building trust and confidence in the safety and effective regulation of the transport of radioactive material* (section 1.2).

**Actions:**

- (v) The Secretariat to continue the current Agency process for the review of Safety Series 112 on compliance assurance and Safety Series 113 on quality assurance, revise the text, as appropriate, and publish new guides in the TS-G series.

After publishing the guidance document, the Secretariat to develop training course material to assist National Competent Authorities in developing a compliance assurance programme that meets the requirements of TS-R-1, “Regulations for the Safety Transport of Radioactive Material.”

### **B.1.3. Guidance on the Safety of the Transport of Recovered Orphan Sources**

12. The International Conference found that *guidance would be beneficial for ensuring safe transport and consistent application of the IAEA Transport Regulations for ‘orphaned’ or lost and discovered sources* (section 2.4).

13. An *orphan source* is a source which poses sufficient radiological hazard to warrant regulatory control, but which is not under regulatory control because it has never been so, or because it has been abandoned, lost, misplaced, stolen or otherwise transferred without proper authorization. Orphaned sources have, in some cases, led to serious injury to persons, even death. In addition, there is the possibility that they might be used for malevolent purposes. It is therefore essential that such sources, when identified, be transported to an appropriate location for storage or disposal. This may not be straightforward in that appropriate transport packages conforming to the requirements of the Regulations for the Safe Transport of Radioactive Material may not be readily available. Guidance is therefore needed, particularly for countries that do not have a sufficiently developed regulatory infrastructure for transport safety to handle this problem adequately.

#### **Action:**

- (vii) The Secretariat to provide input on guidance for the safe transport of recovered sources to an appropriate storage or disposal site. This guidance should be included as part of the Action Plan on Emergency Preparedness and Response being developed pursuant to GC(47)/RES/7A.

### **B.1.4. Transport Safety Appraisals**

14. The International Conference found that *the IAEA Transport Safety Appraisal Service (TranSAS) is an important tool for assessing and assuring compliance at the State level* (section 1.2).

15. The International Conference suggested that *Member States speak to those who have hosted TranSAS missions regarding the benefits of such missions* (section 2.3).

16. In resolution GC(47)RES/7.C, the General Conference:

welcomed recent and planned TranSAS missions and stated that it looked forward to the publication of the results of TranSAS missions (op. para. 14);

and

- commended “those Member States that have already made use of TranSAS”, and encouraged them “to put into effect the resulting recommendations and suggestions, as well as to share their good practices with other Member States”
- and encouraged other Member States “to avail themselves of TranSAS and to improve transport practices based on recommendations and suggestions of TranSAS mission” (op. para 15).

17. In 1998, TranSAS was initiated at the request of the General Conference to render an independent peer review appraisal services to determine the status of compliance with international regulations for the safe transport of radioactive material. The appraisal teams are composed of

qualified experts and observers from Member States with a view to providing a comprehensive and balanced appraisal of a State's regulatory activities in the area of safe transport of radioactive material. Since its initiation, the General Conference has consistently commended those Member States that have requested an appraisal and encouraged other Member States to avail themselves of the appraisals and to improve their transport practices based on recommendations and suggestions of TranSAS missions.

**Actions:**

- (viii) The Secretariat to continue to provide TranSAS missions to Member States on request as resources permit.
- (ix) The Secretariat to review and revise, as appropriate, in consultation with Member States, the appraisal methodology and documentation that supports the appraisal and to report on the results of the review and revision.
- (x) The Secretariat to publish appraisal reports in a timely fashion, and to encourage the appraised States to permit wide distribution of the reports.

**B.1.5. Denial of Shipment**

18. The International Conference found that *enhanced efforts or separate treatment may be warranted for the transport of radioactive material for medical applications* (section 3.4).

19. It was noted by the International Conference that “the nuclear industry and other industries using radioactive material are facing a reduced availability of transport modes and carriers as a result of decisions by commercial carriers, ports and handling facilities not to accept radioactive material.” The International Conference suggested that “the IAEA should work more closely with the modal organizations and with NGOs in determining why shipments of radioactive material are being denied, and develop a strategy for addressing this issue.” Greater efforts to explain the use of the IAEA Transport Regulations to a wide public and industry audience, including the staff of carriers, ports and handling facilities, may contribute to a better understanding of the safety level the Regulations provide (section 2.2).

20. The International Conference suggested that *the IAEA convene a discussion forum between relevant entities (which may include the IMO, ICAO, IATA, the International Federation of Air Line Pilots' Associations (IFALPA), the World Customs Organization (WCO), shipping companies (with a specific focus on air and maritime carriers, ports and handling facilities), and national regulatory authorities to assist in alleviating problems associated with refusals by carriers, ports and handling facilities to accept consignments of radioactive material* (section 3.4).

21. In resolution GC(47)/RES/7.C, the General Conference called for “discussions to address the problems with refusal of shipments” (op. para. 13).

22. A problem with the denial of shipments is that radionuclides intended for use in medical prevention, diagnosis or treatment have been prevented from reaching patients. This is a particular problem in areas of the world where the only means of transport of such radionuclides is by air.

**Actions:**

- (xi) The Secretariat to establish a fact finding discussion forum addressing the concerns of relevant entities, which may include the IMO, ICAO, IATA, the International Federation of Air Line Pilots' Associations (IFALPA), World Customs Organization (WCO), shipping companies (with a specific focus on air and maritime carriers, ports and

handling facilities) and national regulatory authorities, about how delays and denials in transporting radioactive material might be alleviated (in particular for medical applications).

- (xii) The Secretariat to hold a Consultants Meeting (CSM) by August 2004 to analyse these facts and determine what actions might be taken to address them, taking into consideration the approaches identified by the working group on denial of shipments (education/communication, training; standardisation/regulation/harmonisation; facilitation and dispute resolution).
- (xiii) The Secretariat to report the summary findings to the 2004 Annual Meeting of the General Conference.

#### **B.1.6. Transport of Naturally Occurring Radioactive Material**

23. The International Conference identified *a need for additional research to relieve unnecessary regulatory burdens related to the transport of very low activity naturally occurring radioactive material* (section 2.5).

24. Some materials, in addition to uranium or thorium ores, contain relatively high levels of radionuclides of natural origin. The radiation hazards need to be evaluated and decisions made regarding the degree of control that should be exercised to ensure their safe transport.

##### **Action:**

- (xiv) The Secretariat to initiate, in response to Member States commitment, a CRP on the appropriate level of regulatory control for the safe transport of naturally-occurring radioactive material (e.g. ores and other materials).

#### **B.1.7. Radiation Protection Programmes**

25. The International Conference found that, *in general, the individual and collective doses both to workers and to members of the public from the transport of radioactive material are very low, but there are some exceptions* (section 1.1).

26. The International Conference encouraged *broader application of the requirement for radiation protection programmes to be established based on prior risk assessment, and the appropriate collection, analysis and dissemination of radiation exposure data* (section 1.1).

##### **Action:**

- (xv) The Secretariat to complete and publish the existing draft material relating to the establishment of radiation protection programmes and to investigate what further assistance can be provided to Member States. In particular, the Secretariat to consider whether its system for the collection and analysis of data on occupational exposure received during transport of radioactive material (EXTRAM) might be improved to meet the needs of Member States relating to the establishment of effective radiation protection programmes.

#### **B.1.8. Severe Accident Research**

27. The International Conference found that *there may be a need to pursue with a higher priority the already approved Co-ordinated Research Project (CRP) on severe accident studies of radioactive material transport packages* (section 3.2).

28. A CRP was proposed by Member States to examine this issue, but pursuant to guidance from the Transport Safety Standards Committee (TRANSSC), the Secretariat has not solicited Research Agreements from Member States to determine sufficient interest to initiate the project.

**Action:**

- (xvi) The Secretariat to initiate a CRP, in response to Member States commitment, on severe transport accidents.

**B.1.9. Training Programmes**

29. The International Conference found that *the IAEA Transport Regulations provide an excellent basis for the establishment of an effective regulatory process. Nevertheless, there are States in which such a process needs to be put into practice* (section. 3.1).

30. In resolution GC(47)/RES/7.C, the General Conference requested the Agency to strengthen and widen the Agency's efforts in the area of education and training for the safe transport of radioactive material (op. para. 17).

**Actions:**

- (xvii) The Secretariat to publish updated training materials to reflect the latest requirements given in the "Regulations for the Safe Transport of Radioactive Material" in the official UN languages.
- (xviii) The Secretariat to organize annual regional training courses on the safe transport of radioactive material, subject to the availability of resources.

**B.1.10. Emergency Response**

31. The International Conference found that *additional dialogue is warranted to improve overall international emergency response capability, especially with respect to potential maritime incidents; coordinated management between agencies and governments, accident notification, communication, environmental monitoring and salvage/remediation issues were especially considered* (section 1.4).

32. In resolution GC(47)/RES/7.C, the General Conference noted that the International Conference had found that "IAEA guidance provides a framework for a comprehensive strategy for anticipating and dealing with transport accidents involving radioactive material, and that additional dialogue is warranted to improve overall international emergency response capability especially with respect to potential maritime incidents" (op. para. 8).

**Actions:**

Consistent with the development of the Action Plan on emergency preparedness pursuant to resolution GC(47)/RES/7.A,

- (xix) The Secretariat to review the Emergency Preparedness Review Service with respect to events involving the transport of radioactive material, provide the service upon request, and ensure that all Member States are aware of this service.
- (<sup>xx</sup>) The Secretariat's ongoing review of emergency response arrangements to include response to a maritime incident or accident involving radioactive material being transported in international waters to determine, jointly with IMO and other relevant International Organisations, if further action is necessary.

- (xxi) The Secretariat to convene a meeting of Member States, IMO and other relevant International Organisations, and the shipping industry and port authorities inter alia to facilitate dialogue to improve international emergency response capability especially with respect to potential maritime incidents.

#### **B.1.11. Member States' Regulation of the Safety of Transport of Radioactive Material**

33. In resolution GC(47)/RES/7.C, the General Conference requested the Secretariat “to continue to seek regularly from each Member State data needed in order to ensure that the information on how it regulates the transport of radioactive material which is published on the Agency’s transport safety web page is complete and updated” and urged the many Member States which had not provided such data to do so expeditiously (op. para. 10).

##### **Action:**

- (xxii) The Secretariat to request that Member States provide updated information on the status of their implementation of TS-R-1, “Regulations for the Safe Transport of Radioactive Material.”

#### **B.1.12. International Optimization of Regulations**

34. In resolution GC(47)/RES/7.C, the General Conference, taking into account and building on the results of the International Conference, called for “continuing efforts, at appropriate international and regional levels, to optimize measures and international regulations relevant to the international transport of radioactive material” (op. para. 12).

##### **Actions:**

- (xxiii) The Secretariat together with Member States and relevant groups to continue efforts with the IMO, ICAO, UPU and UNECE to optimise measures and international regulations relevant to the international transport of radioactive materials.
- (xxiv) The Secretariat together with Member States and relevant groups to explore the possibility of further harmonization of the international and modal application of the regulations with a view to simplifying multiple licensing processes.

#### **B.1.13. Transport Events Database**

35. In resolution GC(47)/RES/7.C, the General Conference welcomed “the establishment of a database on Events in the Transport of Radioactive Material (EVTRAM)” and encouraged Member States “to provide appropriate information to ensure the efficient operation of the database” (op. para. 16).

##### **Actions:**

- (xxv) The Secretariat to invite Member States to participate in the EVTRAM and SHIPTRAM databases by reporting appropriate information on transport accidents and incidents and shipment data.
- (xxvi) The Secretariat to make available to participating Member States an electronic data input program to facilitate the submission of data and
- (xxvii) The Secretariat to submit the analysed data to Member States.



## **B.2. Actions Related to the Safety of Transport of radioactive Material: Liability and Communication**

36. The Agency's involvement in these Actions will be within the Agency's competence.

### **B.2.1. Liability**

37. In resolution GC(47)RES/7.C, the General Conference stressed "the importance of having effective liability mechanisms in place to insure against harm to human health and the environment as well as actual economic loss due to an accident or incident during the maritime transport of radioactive material", acknowledged the International Conference President's conclusion that "the preparation of explanatory text for the various nuclear liability instruments would assist in developing a common understanding of the complex issues and thereby promote adherence to these instruments", and welcomed "the decision of the Director General to appoint a group of experts to explore and advise on issues related to nuclear liability" (op. para. 4).

38. The Director General has established an Expert Group on International Nuclear Liability (INLEX) that shall serve as a forum of expertise on nuclear liability issues. The functions of INLEX include, amongst others, considering and addressing the nuclear liability instruments adopted under IAEA auspices, with a view to contributing towards a better understanding of these instruments and the international nuclear liability regime as a whole, in particular by assisting the IAEA in drafting explanatory texts on the nuclear liability instruments adopted under IAEA auspices. It should further identify and explore issues pertaining to the application and scope of the nuclear liability instruments adopted under IAEA auspices and more widely. INLEX should also consider the need to develop further the IAEA nuclear liability regime, taking into account specific concerns of both nuclear and non-nuclear countries. In this regard, it should recommend measures to be taken to enhance adherence to an effective nuclear liability regime, including possible changes to fill any identified serious gaps in the regime.

#### **Action:**

(xxviii) The Secretariat to keep Member States informed about INLEX's work concerning the liability aspects of transport of radioactive material.

### **B.2.2. Communication**

39. In resolution GC(47)RES/7.C, the General Conference emphasized "the importance of maintaining dialogue and consultation aimed at improving mutual understanding, confidence building and enhanced communication in relation to safe maritime transport of radioactive material", and in that context supported the recommendation of the International Conference's President that informal discussions should continue among shipping States and relevant coastal States on communication, with Agency involvement, and encouraged interested Member States to engage in those informal discussions (op. para. 6).

40. In resolution GC(47)RES/7.C, the General Conference acknowledged the International Conference President's summary conclusion that "there was scope for additional efforts to communicate the complex technical issues involved in the area of safety which relate to transport", endorsed the International Conference President's suggestion that "the Agency hold a seminar to discuss the latest information on these issues in due course", and encouraged all concerned States to participate in such an event (op. para. 7).

41. The International Conference welcomed *the proposal to extend the INES nuclear incident reporting scale to transport incidents, in the interests of transparency and communication with the public* (section 0.4).

**Actions:**

- (xxix) The Secretariat to hold a seminar in early 2005 to discuss the latest information on the complex technical issues involving the area of safety, which relate to transport.
- (xxx) The Secretariat to review the current status of incorporation of transport events in INES and to provide Member States with a revised INES guidance when available.
- (xxxii) The Secretariat to take note of the importance placed by Member States on the maintenance of dialogue and consultation aimed at improving mutual understanding, confidence building and enhanced communication in relation to safe maritime transport of radioactive material and their support for the recommendation of the Conference President that informal discussions should continue among shipping States and relevant coastal States on communication, with Agency involvement.