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The IAEA Assistance Programme for Transport Security

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ABSTRACT

The International Atomic Energy Agency's (IAEA) Office of Nuclear Security has been working cooperatively with the U.S. Department of Energy's Global Threat Reduction Initiative, European Union and other nuclear member States (e.g. Australia) to provide transport security assistance to countries throughout the world. This assistance programme is complementary to the development of the Nuclear Security Series publications which include transport security in their scope.

The assistance programme has three primary components: assessment; upgrades; and, training. Assistance is directed at implementing a consistent level of security throughout the life cycle of nuclear and other radioactive material to provide the same level of security during transport as when in a fixed facility.

The assistance is available to countries for assessing and/or upgrading all elements of their transport security programmes, either at the State level (regulatory and other government agencies) or at the operator level (shippers and carriers). This includes diverse assistance such as:

- expert advisory missions to provide advice and guidance, including as part of the broader scope International Physical Protection Advisory Service (IPPAS) missions;
- planning support to identify and prioritize needs (developing security approaches and plans) and developing model security plans and procedures;
- equipment (vehicles, packages, command and control equipment, etc.);
- training as suggested by the assessment or in order to improve capacity building.

A large spectrum of training courses on security in transport of either radioactive material or nuclear material is currently available:

- training for regulatory, governmental and industry personnel, and nuclear security students;
- training to "train the trainers" and developing national training courses;
- transport security awareness, including a high level short course for managers and decision makers;
- detailed training on developing and implementing transport security programs.

This paper describes the current IAEA assistance programme and training for transport security, including all of the IAEA Office of Nuclear Security activities which include transport security in their scope and the related achievements.

Development of Nuclear Security Series publications

Among its many functions, the Office of Nuclear Security of the International Atomic Energy Agency develops recommendations and guidance that are then used for developing, implementing and maintaining nuclear security programmes (regimes and systems). The recent development of Nuclear Security Series (NSS) publications related to transport security include

- the publication of the nuclear security fundamentals (NSS No. 20 ¹);
- the publication of three sets of recommendations covering nuclear security of nuclear material and nuclear facilities (NSS No.13 ²), nuclear security of radioactive material and associated facilities (NSS No.14 ³) and detection of and response to nuclear and other radioactive material out of regulatory control (NSS No.15 ⁴);
- the drafting of an implementing guide (NST017) 'Security of Nuclear Material in Transport' ⁵ ⁶ and
- the drafting of a technical guidance (NST008) on a 'methodology to detect illicit trafficking of nuclear and other radioactive material across borders' ⁷ ⁸.

The IAEA has adopted a top down approach with the publication of the security fundamentals and the three sets of recommendations and then with the preparation, revision and publication of related implementing guides and technical guidance.

Peer reviews and assistance/evaluation missions

The three sets of recommendations (NSS No.13, NSS No.14 and NSS No.15) provide the basis for questionnaires aimed at determining the level of development and implementation of nuclear security regimes and systems by either Member States and/or operators. These different questionnaires are used in peer reviews and advisory missions performed by the Office of Nuclear Security. These reviews and missions result in the identification of best practices, the development of recommendations for strengthening the security programme and the planning for an assistance programme by the IAEA to the Member State.

IPPAS (International Physical Protection Advisory Service)

IPPAS was created by the IAEA to assist States in strengthening their national nuclear security regimes. IPPAS provides peer advice on implementing international instruments, and Agency guidance on the protection of nuclear and other radioactive material and associated facilities.

In late 2012, a questionnaire covering nuclear material transport security was developed on the basis of the newly published IAEA Recommendations NSS No. 13 (INFCIRC/225 Revision 5). Also at the end of 2012, the scope of IPPAS was extended to cover security of radioactive material and associated facilities and associated activities. A related questionnaire on transport security of radioactive material matching NSS No. 14 recommendations and NSS No. 9 implementing guide is under development.

At the request of a Member State, IPPAS assembles a team of international experts that examines the State's system of physical protection, compares it with international best practices and makes recommendations for improvements. IPPAS missions are conducted both on a nationwide and facility-specific basis.

International Nuclear Security Advisory Service (INSServ)

The International Nuclear Security Advisory Service (INSServ) serves as a flexible instrument to help a State to review the general status of measures that protect against nuclear terrorism and identify ways to improve a broad spectrum of nuclear security activities. The recommendations provide a platform for preparation of a country-specific Integrated Nuclear Security Support Plan (INSSP) for future implementation, through IAEA programmes and bilateral assistance.

During an INSServ mission experts cover the following main topics: the legislative and regulatory system related to the nuclear security; physical protection of nuclear and radioactive material; detection of and response to illicit trafficking in nuclear and radioactive material and human resources development in nuclear security.

INSServ teams utilize a number of IAEA guidance documents that are useful for States to develop plans and programmes that are effective, efficient and consistent with internationally recognized guidance and practices.

INSServ is not restricted to any particular group of Member States. INSServ missions are available to any country having nuclear and/or radioactive materials and associated facilities. Assistance is provided upon request from the Member State.

Integrated Nuclear Security Support Plan (INSSP)

The Agency has taken steps towards consolidating States' nuclear security needs into integrated plans for nuclear security improvements and assistance. The Agency drafts, in consultation with the host State, the Integrated Nuclear Security Support Plan (INSSP), which is tailored to the State's specific needs on the basis of findings and recommendations from other peer reviews and assistance missions like IPPAS and INSServ, and supported and supplemented by other Agency information.

The establishment of the INSSP mechanism has brought *ad hoc* interventions into a systematized approach. As a holistic mechanism, an INSSP provides a platform for nuclear security work to be implemented over a period of time, thus ensuring sustainability. All needs are included irrespective of how the need is fulfilled. The INSSP enables the Agency, the State concerned and any donors financing the work to plan and coordinate activities from both a technical and a financial point of view, optimizing the use of resources and avoiding duplications. It also enables some States to prepare and implement the necessary nuclear security improvements internally and without external assistance.

A typical INSSP presents five components of work related to nuclear security: Legislative and Regulatory Framework, Prevention, Detection, Response, and Sustainability. The INSSP identifies the needs, responsible entities and organizations within the State as well as the timeframe for the implementation of agreed activities.

Like INSServ missions, many INSSP missions conclude in the agreed plans to hold a national training course on transport security of radioactive material. Transport security is considered as an illustrative domain to implement security as a first step.

In conclusion, for all these peer reviews and advisory missions, agreed follow-up activities are identified and undertaken by the host and the IAEA, as soon as is practical. At the request of the host, follow-up activities may include:

- Staff training and related human resources development;
- Development of nuclear security regulations and laws; and
- Improvement of nuclear security systems.

The IAEA NSS recommendations are taken *de facto* as reference in the framework of the peer reviews and advisory missions to determine the level of implementation of nuclear security regimes and systems by Member States.

Assistance specific to transport security

The International Atomic Energy Agency's (IAEA) Office of Nuclear Security is working cooperatively with the U.S. Department of Energy's Global Threat Reduction Initiative (GTRI), the European Union and Australia to provide transport security assistance to countries throughout the world. Assistance is being made available to countries in reviewing and upgrading their transport security programs at all levels, including the:

- National level (regulatory and other government agencies); and,
- Operator level (shippers and carriers).

GTRI has developed similar tools to provide assistance to Member States in the domain of transport security; GTRI shared its experience and tools with IAEA providing kits for training, experience and lecturers for national/regional/international training courses, questionnaires, methodology and experienced staff to conduct assessment missions.

Transport security assessment mission

This assistance is directed at implementing a consistent level of security throughout the life cycle of nuclear and other radioactive material (same level of security during transport as when in a fixed facility), particularly for high activity radioactive sources and for Category I and II nuclear material. The assistance programme is intended to help establish uniform transport security in participating countries.

A transport security assistance process has been established to ensure that the assistance program uses a structured and repeatable approach. The intention is to provide integrated comprehensive transport security support for Member States which includes:

- performing assessments of transport security cultures, programs and implementation at the national and operator (consignor/shipper, carrier and consignee/recipient) level to identify gaps and weaknesses; This is done cooperatively with the host country and is focused on identifying where assistance is desired in order to structure the nature of the assistance provided.
- developing recommendations for upgrades;
- developing standardized upgrade suites for use in countries where this is beneficial; and,
- providing transport security awareness and detailed training to national authorities and operators.

The assessment process establishes a uniform approach to evaluating the transport security culture and practices of a country. This process uses a written assessment protocol that ensures a comprehensive, consistent, and effective approach to conducting the assessments.

Included in the scope of the assessment process are:

- assessment preparation and planning;
- roles and responsibilities of assessment participants;
- performance and reporting of the assessment;
- follow-up and verification; and,
- agreement on the actions to be taken as a result of the assessment.

Implementation of this standardized methodology ensures that assessments are performed and documented in a consistent manner by qualified and experienced transport security subject matter experts.

The result of each assessment is a report that includes recommendations to further develop or strengthen a country's transport security program. The recommendations provide a path forward that will allow the IAEA and other donor states to determine how to best assist the assessed country or organization to strengthen their transport security program.

To date, transport security assessments have been provided to China, Indonesia, Malaysia, Nepal, the Philippines and Sri Lanka; Peru, Canada and Mexico; Armenia, Belarus, Bulgaria, Georgia, Hungary, Kazakhstan, Russia and Ukraine.

Upgrades

Upgrade assistance can include:

- Providing expert advisory missions to provide advice and guidance
- Holding training courses for regulatory, governmental and industry personnel
 - Transport security awareness (normally a one-day workshop)

- Detailed training on developing and implementing transport security programs (normally a 4-5 day detailed training course including practical exercises)
 - Planning to identify and prioritize needs (developing security approaches and plans)
 - Developing regulations, regulatory guidance, model security plans and procedures
 - Procuring and providing equipment (vehicles, packages, command and control, communications, etc.), including operational training in the use of the equipment

Transport security assistance in the form of regulatory and technical upgrades is in progress in several countries. At this time equipment is being provided to China and the Philippines; Armenia, Kazakhstan, Russia and Ukraine.

This equipment varies from basic technologies such as tamper indicating devices to vehicles that have been designed to transport large irradiator sources and are equipped with:

- Hardened locks for cargo area
- Hardened chains or other strengthened tie downs
- Vehicle anti-theft system w/starting disabling device
- Vehicle tracking & data communication system
- Cargo area intrusion detection system
- Driver duress button
- Operator ID system
- Steel security boxes
- Communications devices for short and long ranges.

Training

Two training courses have been developed, based on the implementing guides NSS No. 9 and NST017 and the related sets of recommendations NSS No. 13 and NSS No. 14, one covering the security in the transport of radioactive material and one covering the security in transport of nuclear material. The training material was developed cooperatively by the IAEA, GTRI and Australia and with numerous experts in transport security.

The goals of the transport security training courses are to:

- Illustrate the need for adequate security during the transport of nuclear and other radioactive material,
- Define levels of security for radioactive material and the category for the nuclear material, with appropriate security measures, and
- Enable member states to effectively implement transport security programs.

The target audience for the training course includes regulators, shippers, carriers and other persons (such as law enforcement agencies, e.g. Customs, police and military) involved in the shipment of nuclear and other radioactive material.

The courses use the following outlines (Table 1). The course structure is similar. It includes 12 modules for transport security of radioactive material and 16 modules for transport security

of nuclear material, and three practical exercises. The content of the modules is mainly different even when bearing the same title. Both courses have been given as national and as regional training courses on a 4-5 days basis. The two courses are complementary, addressing, when applicable, the radioactive and nuclear properties of the material to be transported.

Table 1: Outline of the Transport Security training courses

| Training on Security in the Transport of Radioactive Material | Training on Security in the Transport of Nuclear Material |
|--|--|
| Module 1 – Introduction (course and activities description) | Module 1 – Introduction (course and activities description) |
| Module 2 – Transport Background | |
| Module 3 – The Need for Transport Security | Module 2 – The Need for Transport Security |
| Module 4 – International Requirements and Guidance | Module 3 – International Requirements and Guidance |
| | Module 4 – Transport Safety and the Interface with Security |
| Module 5 – IAEA Implementing Guide on Security of Radioactive Material during Transport | Module 5 – IAEA Implementing Guide on Security in the Transport of Nuclear Material |
| | Module 6 – Characterization of Nuclear Material |
| | Module 7 – Threat Assessment and Design Basis Threat |
| Module 6 – Transport Security Approaches | Module 8 – Transport Security Approaches |
| | Module 9 – Mode Independent Measures |
| | Module 10 – Mode Specific Measures |
| | Module 11 – International Shipments |
| Module 7 – Prudent Management Practices and Basic Security Level | |
| Module 8 – Enhanced Security Level | |
| Module 9 – Additional Security Measures | Module 12 – Additional Measures Based on Potential Radiological Consequences |
| Practical Exercise 1 – Film “Safe and Secure Transport of Radioactive Material” | Practical Exercise 1 – Film “Safe and Secure Transport of Radioactive Material” |
| Module 10 – Developing the Transport Security Plan | Module 13 – Developing the Transport Security Plan |
| Practical Exercise 2 –Transport Security Plan Workshop | Practical Exercise 2 –Transport Security Plan Workshop |
| Module 11 – Readiness Review for Transport of Radioactive Sources and Materials | Module 14 – Readiness Review for Transport of Nuclear Material |
| Practical Exercise 3 – Security Readiness Review Workshop | Practical Exercise 3 – Security Readiness Review Workshop |
| | Module 15 – Recovery of Nuclear Material and Measures Against and in Response to Sabotage |
| Module 12 - Implementation | Module 16 - Implementation |

The practical exercises are intended to give the participants tools used in transport security and a first-hand opportunity to experience the work that is involved in

- identifying security measures through four scenarios condensed from a 35 minute IAEA film on the safe and secure transport of radioactive material;
- writing a transport security plan; and
- performing a readiness review, followed by a review of the existing/failing security measures according to security functions.

For the security plan exercise, students are given information about a specific shipment for which a transport security plan must be developed. Building on a model transport security plan they are given, they must select appropriate security measures for the shipment based on its radioactivity level/Category (for nuclear material) and the threat against which they want to protect the shipment. In the third exercise, participants perform a readiness review of a simulated shipment. The host country is asked to provide a transport vehicle (typically a van) containing a package and equipped with the security provisions required for a shipment of a radioactive source. The readiness review is carried out based on the security plan the students developed in the previous exercise.

The two training materials have been used both by the IAEA and the GTRI to perform training courses all over the world. Both IAEA and GTRI sponsor the courses which are frequently given jointly.

For the training on Security in the Transport of Radioactive Material:

- At National level: Peru (2x) and Guatemala; Burkina Faso, Mauritania, Morocco and Nigeria; China (x3) and the Philippines; Armenia, Bulgaria and Ukraine; planned in Ecuador in 2013.
- At Regional/International level: Ghana, Senegal and South Africa; Germany (x3) and Ukraine; Australia; Peru and Mexico; Malaysia and Saudi Arabia; planned in Niger and Germany in 2013.

For the training on Security in the Transport of Nuclear Material

- At National level: Brazil and Mexico; South Africa; Indonesia.
- At Regional/International level: Australia; Germany; planned in Indonesia and Saudi Arabia in 2013 and 2014 respectively.

The training course on security of nuclear material in transport is available in English, and plans are made to translate this training material into Arabic and Spanish. The pilot course was conducted in August 2012 in Mexico in English.

The training course on security of radioactive material in transport has been updated in 2012 to take into account four years of feedback from course participants, new IAEA publications (on safety and security) and to be consistent with the new training material on security of nuclear material in transport. The training material is now available in English, Spanish and French all of which pilot courses have been run in 2012 and 2013.

The IAEA has initiated an effort to extend the translation to all UN languages for both training materials.

Conclusion

The assistance programme has three primary components: assessment; upgrades; and, training. Assistance is directed at implementing a consistent level of security throughout the life cycle of nuclear and other radioactive material to provide the same level of security during transport as when in a fixed facility. Initially designed for transport security of radioactive material, the programme now also covers security of nuclear material in transport.

The assistance is available to countries for assessing and/or upgrading all elements of their transport security programmes, either at the State level (regulatory and other government agencies) or at the operator level (shippers and carriers).

By performing national and operational assessments and providing training and transport security upgrades, the programme assists regulatory bodies and operators (consignors, carriers, and consignees) in understanding the importance of their role and how they interface with other organizations involved in the transport of radioactive material.

If you are interested in taking advantage of this IAEA assistance programme, please contact (Mr.) Jean-Yves Reculeau of the IAEA Office of Nuclear Security at +43-1-2600-24677 or J-Y.Reculeau@iaea.org or (Mr.) Stig Isaksson °.+43-1-2600-23149 or S.ISAKSSON@iaea.org

¹ INTERNATIONAL ATOMIC ENERGY AGENCY, Objective and Essential Elements of a State's Nuclear Security Regime, Nuclear Security Fundamentals, IAEA Nuclear Security Series No. 20, IAEA, Vienna (2012).

² INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5), IAEA Nuclear Security Series No. 13, IAEA, Vienna (2011).

³ INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Radioactive Material and Associated Facilities, Recommendations, IAEA Nuclear Security Series No. 14, IAEA, Vienna (2011).

⁴ INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Security Recommendations on Nuclear and Other Radioactive Material out of Regulatory Control, IAEA Nuclear Security Series No. 15, IAEA, Vienna (2011).

⁵ INTERNATIONAL ATOMIC ENERGY AGENCY, Physical Protection of Nuclear Material during Transport, Implementing Guide, IAEA Nuclear Security Series No. NST017, IAEA, Vienna (Under preparation).

⁶ ERIKSSON Ann-Margret, RAWL Richard R.- IAEA Recommendations and Guidance on Security in Transport of Nuclear and Other Radioactive Material, Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials (PATRAM), Son Francisco (2013).

⁷ INTERNATIONAL ATOMIC ENERGY AGENCY, Methodology to detect illicit trafficking of nuclear and other radioactive material across borders, Technical Guidance, IAEA Nuclear Security Series No. NST008, IAEA, Vienna (Under preparation).

⁸ RECULEAU Jean-Yves, COLGAN Peter, ERIKSSON Ann-Margret, NANDAKUMAR A. KRAVCHENKO Nikolay, WILSSON Leanne, ARDERN Nick, Methodology to Detect Illicit Trafficking of Nuclear and other Radioactive Material across Borders, Proceedings of the 17th International Symposium on the Packaging and Transportation of Radioactive Materials (PATRAM), Son Francisco (2013).