

Good Practices Guide to Secure Road Transport of Civilian Nuclear Material

Nuclear Security Summit Transport Gift Basket

*Lessons Learned from Road Tabletop Exercise and Sharing the Experiences based
on INFCIRC/225/Revision 5 and its Implementing Guide*

By Canada, France, Japan, Republic of Korea, and
the United States of America

Contents

- 1. Introduction** 3
 - 1.1 Background..... 3
 - 1.2 Contents 4
 - 1.3 Exercise carried out by Japan 4
- 2. Pre-operational planning, coordination and logistics**..... 5
 - 2.1 Contingency plans 5
 - 2.2 Components of convoy 5
 - 2.3 Trucks 5
 - 2.4 Packages..... 6
 - 2.5 Routes 6
 - 2.6 Information sharing, information security..... 6
 - 2.7 Communications 7
 - 2.8 Pre-departure check..... 7
- 3. Execution of transport**..... 8
 - 3.1 Transport Control Center (TCC)..... 8
 - 3.2 Alert time..... 8
 - 3.3 Communication with the chief transporter..... 8
 - 3.4 Tracking 8
 - 3.5 Accidents..... 8
- 4. Emergency Response**..... 9
 - 4.1 Natural Disaster Case..... 9
 - 4.2 Sabotage and unauthorized removal..... 10
 - 4.3 Response to Radiation Influence..... 10
 - 4.4 Collaboration with other transport mode 11
- 5. Post Mission Analysis:**..... 11

1. Introduction

1.1 Background

To fulfill its international obligations each State party to the Convention on the Physical Protection of nuclear material bears the responsibility to protect and secure nuclear material during their transport. To facilitate the implementation of the CPPNM, the International Atomic Energy Agency (IAEA) has issued guidance on the physical protection measures of nuclear material in the document *Recommendations on Physical Protection of Nuclear Materials and Nuclear Facilities* (INFCIRC/225/Revision 5).

On the occasion of the Third Nuclear Security Summit held in The Hague (March 24-25, 2014) the leaders of the participating States of the Transport Security Gift Basket¹ issued a Joint Statement to express their further commitment to work together for improving security in the transport of nuclear and other radioactive materials. In this Joint Statement, the participating States expressed their intention to consider conducting table-top exercises for all transport modes and proposed among other actions to share the good practices of above-mentioned activities with the IAEA and other States while protecting sensitive information in order to actively contribute to the IAEA's drafting efforts of the Nuclear Security Series.

In the context of the Nuclear Security Summit (NSS) 2016, Transport Security Working Group, chaired by Japan, four participating States volunteered as “mode leads” for four modes of transportation: Japan for the road transports, the United Kingdom for the maritime transports, Kazakhstan for the rail transports and the United States for the air transports.

These “mode leads” held four national tabletop exercises (TTX) each of which covered one transport mode. These exercises were based on Section 6 of INFCIRC/225/Revision 5² and the 30 September 2014 draft of the *Security of Nuclear Material in Transport: Implementing Guide*. They aimed at providing each mode lead's national perception of how to implement the recommendations contained in INFCIRC/225/Revision 5 on the transport of nuclear material.

More specifically, these exercises were to highlight practical applications for the **protection of category I and II non-irradiated civil nuclear material** while in transport. Due to the sensitive nature of operations involving nuclear materials, the participants to this NSS transport gift basket agreed that documents produced in support of and resulting from the exercises contain only non-sensitive information.

¹ France, Japan, Republic of Korea, United Kingdom and United States

² http://www-pub.iaea.org/MTCD/publications/PDF/Pub1481_web.pdf

As a preamble, it is assumed that obligations on States parties to the Convention on the Physical Protection of Nuclear Material (CPPNM) are fulfilled. An underlying principle to ensure the fulfillment of the CPPNM obligations is the establishment by each State of a legislative and regulatory framework to govern physical protection. The INFCIRC/225/Revision 5 provides guidance of the elements to take into consideration for establishing such a national framework.

1.2 Contents

This practical guide offers general advice to safely and securely plan road transport of category I and II civil nuclear materials and reflects information discussed during the Japan-led road TTX. The guide's structure follows the TTX:

- **Pre-operational planning, coordination, and logistics** which includes security planning (e.g., convoy formation, route selection, information security); and final pre-departure meeting.
- **Execution of transport**, including communication at departure; and route security
- **Emergency response**, including natural disaster case; and sabotage case
- **Post mission analysis**

1.3 Exercise carried out by Japan

As INFCIRC/225/Revision 5 states, it is important to have legislative and regulatory frameworks in place governing the physical protection of nuclear material. Japan has laws and regulations to do so. At the implementation level, the Nuclear Regulation Authority (NRA) and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), which regulate the transport of Category I & II nuclear materials (INFCIRC/225/Revision 5, Table 1, Categorization of Nuclear Materials), have published rules and regulations for these transports such as the Ordinance on Transport out of Factories or Establishments of Nuclear Fuel Material, etc. (核燃料物質等の工場又は事業所の外における運搬に関する規則) and the Ordinance on Transport of Nuclear Fuel Material, etc. by Vehicles (核燃料物質等車両運搬規則) based on the Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors. These ordinances outline the requirements for the road transport missions in Japan.

The final version of the road TTX is provided in Appendix I. The Ordinance on Transport out of Factories or Establishments of Nuclear Fuel Material, etc. (核燃料物質等の工場又は事業所の外における運搬に関する規則) and the Ordinance on Transport of Nuclear Fuel Material, etc. by

Vehicles (核燃料物質等車両運搬規則) are provided in Appendix II and III respectively, written in Japanese.

2. Pre-operational planning, coordination and logistics

2.1 Contingency plans

- Contingency plans are recommended to guaranty a fast and proportionate response.
- In case of an emergency situation, local authorities would organize appropriate coordination with national authorities and assets.
- To check the effectiveness of contingency plans and everybody's understanding of their part in them, preliminary exercises are recommended.

2.2 Components of convoy

- The transport vehicles are to be fully equipped according to the category and local requirements of the nuclear materials transported.
- In some cases, to prepare for emergency response, the necessity to deploy rearguard support vehicle with emergency responding personnel, which is separate from the convoy, should be considered.
- Critical transport operation personnel who should be on board in case of emergency include the chief transporter, who is the responsible person on board, as well as specialists in handling radiation and nuclear fuel material.
- It is also recommended that lookouts are deployed to appropriate (e.g. fore or aft) positions of the convoy and, depending on the route, other lookouts are deployed in advance to make sure the safety and security of the route. Furthermore, carrying radiation measuring devices and radiation protection devices are recommended for radiation accidents.

2.3 Trucks

- The Trucks must satisfy the safety standards and be surely taken measures under the physical protection plan of nuclear material transport (immobilization, lock, seal, etc.). These should be submitted as transport plans to the competent authorities in advance and to be checked by the competent authorities before the transport.

2.4 Packages

- Packages must answer safety standards and provide the appropriate level of robustness and weight to protect from malicious act. They should be adequately certified, and loading and lashing to the truck should be checked prior to departure;

2.5 Routes

- Transport plans are to minimize transport distances and the time;
- More than one transport routes taking into account various factors such as the road works, amount of traffic, circumstances of the urban areas, sidewalks, bridges, and tunnels are required.
- At the same time, it is required that the route is not identified by outsiders, who are neither the national or local government officials nor the operators involved in the operation. Regarding the choice of the route, the operator should submit a notification of nuclear fuel transport to law enforcement authorities.

2.6 Information sharing, information security

- Authority's threat information is to be shared with transporter and competent authorities to react appropriately.
- All relevant players should be identified in advance and how much information each player is shared should be clarified.
- The contents of the message and how to coordinate it in case of emergency should be clarified among all relevant players in advance.
- Regarding information security, according to the need-to-know principle, the need of information sharing should be well argued and only the necessary information should be shared with specific players.
- Security of the information management and communication tools should be fully considered. When electronic media are used, security methods such as encryption or password setting should be surely taken.
- Printed documents should be thoroughly kept under lock and key. Measures such as numbering for control should be taken.
- The operators should develop guidance for information management and teach transport personnel the information management including importance of information security.
- The trustworthiness of individuals involved during transport should be predetermined as much as possible by the methods in consistent with the domestic laws and regulations.

- Some of the methods to predetermine the trustworthiness may include proof of identity based on official documents, interviews, and aptitude tests.

2.7 Communications

- It is recommended that encrypted communication assets are redundant and that communication numbers and communication assets be checked prior to departure (mobile phones, mobile satellite solutions, and radio).
- Continuous communications are to be maintained between the Transport Control Center (TCC) and the nuclear transport while in process.
- For category I and II civil non irradiated nuclear materials transports, communication means need to be diverse and secured.
- It is advised that contingency plans are in place with relevant State organizations.
- To ensure the communication means are usable in emergency, it is important that the personnel for transport operation check the communication tool numbers each other at the pre-departure meeting, and after the pre-departure meeting, try to use the communication tools among the transport personnel. Furthermore, it is important to make sure the communication with the Transport Control Center (TCC). Especially in case of Category I transport, it is required that the communication means are diverse and secure. In addition, a contingency plan at the place where communication breakdown may occur such as tunnel should be considered with relevant organizations such as law enforcement authorities in advance.

2.8 Pre-departure check

- For category I and II civil non irradiated nuclear materials transports, special attention is to be paid on organization and coordination of security while nuclear materials are in process of transport between the departing facility and the destination facility.
- Prior to departure, a pre-departure security meeting to which both authorities and carrier participate is required. Reconnaissance of the itinerary is highly recommended.
- The security company should check the circumstances on the route by running a covert surveillance shortly before the convoy departs. The report of this advance run is crucially important information for the transport operator to make a decision to implement the transport at the pre-departure meeting. If any worries were found while the security company checks the route in advance, it is important to consult with law enforcement authorities as appropriate.

- The safety of the packages should be ensured before the departure by checking that the packages are appropriately tied down to the vehicle and can not be damaged by moving, rolling, or falling.

3. Execution of transport

3.1 Transport Control Center (TCC)

- The TCC has to be fully manned during all the transport process.
- The TCC should be able to make decision, gather and share information.
- Changing route while transporting should be considered when the nuclear transport is or might be blocked or slowed down due to traffic congestion. In this case, the TCC decides the safe and secure alternative route together with authorities. Perfect coordination between the TCC and the transport personnel is required.
- If the route is changed, law enforcement authorities should take necessary measures as appropriate such as leading the convoy and dispatching reinforcements, considering the cause and security environment.

3.2 Alert time

- Transports must be carefully scheduled and alert time perfectly shared and known among those who need to know.

3.3 Communication with the chief transporter

- The TCC should have priority to contact the chief transporter as well as to contact all involved parties.
- The escort commander is responsible for the security of the transport. He is in permanent radio / telephone contact with the chief transporter.

3.4 Tracking

- Continuous tracking of the convoy should be real time. Especially for Category I, satellite based tracking systems are recommended.

3.5 Accidents

- In case of technical breakdown on the vehicle, the carrier is responsible to provide repair or tow truck. States authority should provide necessary asset to guide the nuclear material to the nearest safest place where complementary security measures are to be taken.
- To prepare for incapacitation of drivers, it is recommended that the operators designate backup drivers in advance and allocate them in the convoy.
- When the convoy stops because of driver's incapacitation, the escort unit takes measures to ensure safety and security such as traffic guide while protecting the convoy.
- The chief transporter notifies the situation and reasons of delay to the TCC. The TCC notifies the situation and reasons of delay to the competent authorities and law enforcement authorities. If it is necessary to change the route according to the situation and reasons of delay, the route should be changed with permissions of the competent authorities and law enforcement authorities after consultations with them.
- If the route is changed, law enforcement authorities should take necessary measures as appropriate such as leading the convoy and dispatching reinforcements, considering the cause and security environment.
- If the convoy deviates from the route because of negligence of the transport personnel or accidents, the chief transporter should notify the TCC as soon as possible. The TCC should notify the cause of deviation and the change of the route to the competent authorities and the law enforcement authorities as soon as possible and discuss the next actions with them.

4. Emergency Response

4.1 Natural Disaster Case

- It is the chief transporters responsibility to decide whether or not to stop the transport. He reports to the TCC and provides general information about the disaster.
- Local Law enforcement authorities closely cooperate with the chief transporter, who is on site, and the TCC, and instruct them to find a safe place and a route to evacuate immediately.
- The chief transporter together with local authorities to take immediate safety measures.
- Security measures are to be taken in addition to safety measures.
- Decision whether or not to stop is to be taken by the chief transporter. It has to be confirmed by the TCC.
- When assessing the situation, the worst scenario prognosis should be considered.
- All nuclear material transports are tagged as "nuclear" even category I and II non-irradiated civil nuclear materials transports.

- The decision of the route change is to be made regarding effective threat information and the security forces are to be available to keep the transport secured.
- In case of communication breakdown, the operator implements the contingency plan and reports to competent authorities and law enforcement authorities.
- While security information is only to be shared with those who need to know, safety information is to be shared with first responders (policemen, firefighter) so that radiological measures could be taken appropriately.

4.2 Sabotage and unauthorized removal

- In the field, the transport is the one to take the immediate reactive measures (reflex security measures).
- It is crucially important that information is to be centralized at the chief transporter and shared with the TCC and local authorities.
- In case of sabotage, regardless of the category of transported material, nuclear transports are expected to be kept moving until the closest safe and secure place.
- Should one vehicle be attacked, it is of high priority that other nuclear vehicle of the convoy move to and park at a safe place to avoid second disaster.
- In case of emergency, it is necessary for the chief transporter to have procedures and assets to cooperate with the police unit.
- The operator should consult with the competent authorities and law enforcement authorities in advance when developing transport plan and contingency plan. The police security plan should be developed in conjunction with the operator's transport plan and contingency plan based on the advanced discussion
- TCC should cancel any other scheduled transport and divert those in process to the closest secure place.
- Transport vehicle should possess built in processes and equipment to avoid from car-jacking (immobilization, keys...)
- Drivers and the chief transporter are the one who can inform the safety of both nuclear material and the truck (seals, ability of the truck to move). They should be able to inform potential leaks using radiation detectors upwind.
- The escort commander gathers security and safety information and the chief transporter relays the gathered information to the TCC.
- All reaction processes are made under the TCC supervision and keeping authorities and law-enforcement and relevant agencies informed.

4.3 Response to Radiation Influence

- It is important to develop domestic laws and regulations in order to prevent nuclear security incidents and prepare for and respond to safety and security events. In this regard, the measures to minimize the impact on the local residents should be taken at the national level.
- The convoy should carry necessary radiation measuring devices such as an alpha-ray survey meter, a beta-gamma survey meter, a neutron dose rate measuring instrument, a space dose rate measuring instrument, a Smear method radioactivity measuring device, an air sampler, and a nuclide analyzer.
- In case that the safety and security of the packages are ensured, if a facility that can store and manage nuclear material is situated nearby, the transport to the facility should be considered. If the departure point is close enough, it is appropriate to give a high priority to go back to the departure point.

4.4 Collaboration with other transport mode

- All civil nuclear transports are not on road. In case that a transport operation involves transporting on road, loading to a maritime transport vessel at a port facility, and transporting by sea, for example, seamless security measures are required. For this reason, it is necessary to make an arrangement in advance of smooth transition of the escort of each transport mode, and information sharing with and instructions or recommendations to those who are involved in the next transport mode in case of an accident or terrorism incident.

5. Post Mission Analysis:

- After the transport of nuclear material, the transport operator should review and always consider improvement for the next transport. Competent authorities and law enforcement authorities should also review respectively to improve their regulations or security plans.

APPENDIX I: 2016 Nuclear Security Summit Transport Security Gift Basket Road TTX

APPENDIX II: The Ordinance on Transport out of Factories or Establishments of Nuclear Fuel Material, etc. (核燃料物質等の工場又は事業所の外における運搬に関する規則)

APPENDIX III: The Ordinance on Transport of Nuclear Fuel Material, etc. by Vehicles (核燃料物質等車両運搬規則)