Canadian Nuclear Safety Commission (CNSC)

Canada's Nuclear Regulator

Regulation of the Transport of Nuclear Substances

E-docs # 5201139

Outline of Presentation

- Transport of Radioactive Material: Overview of the Regulatory Requirements
- Transport of Radioactive Material: Overview of Emergency Preparedness
- Transportation Security Used Nuclear Fuel

TRANSPORT OF RADIOACTIVE MATERIAL: OVERVIEW OF THE REGULATORY REQUIREMENTS

Raj Garg, Transport Advisor
Transport Licensing and Strategic Support Division

Introduction

- Regulatory Basis
- Types of packages for transport
- Certification and licensing process
- Responsibilities: consignor, carrier and consignee
- Enforcement
- Emergency response
- Security

Responsibility

The transport of radioactive material in Canada is regulated by both:

- The federal government, and
- The provinces/territories

Regulators

At the federal level, the responsibility is jointly shared by:

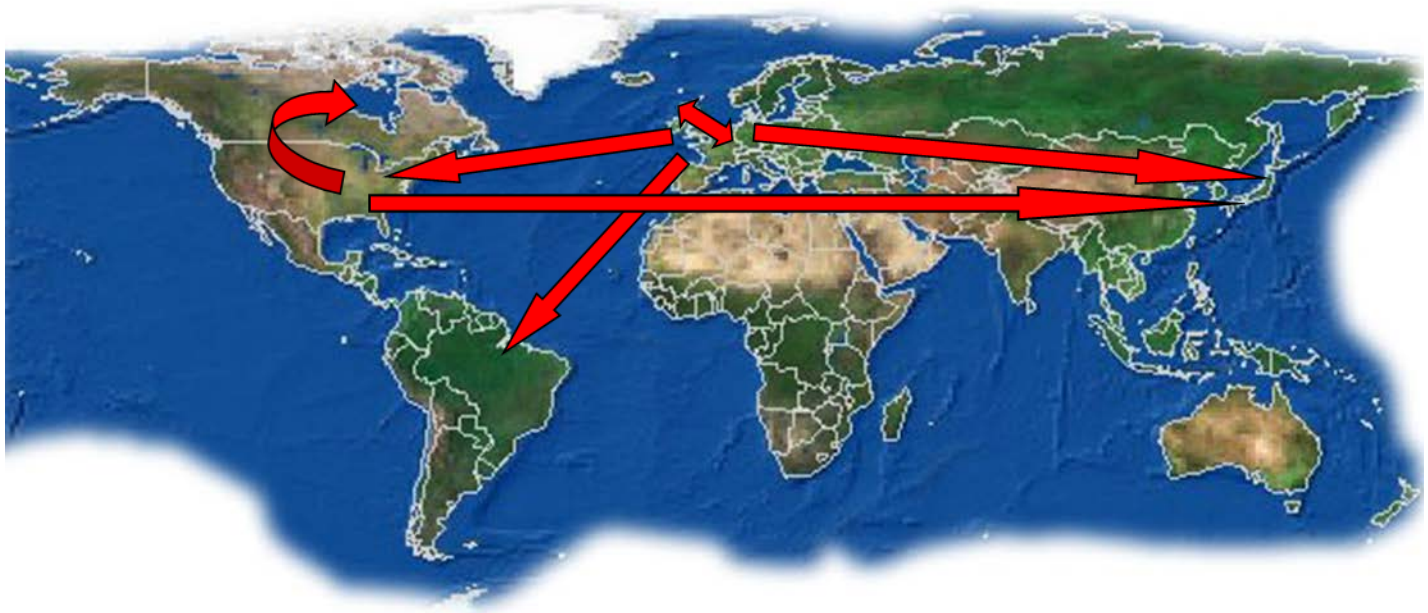
- CNSC/Nuclear Safety and Control Act / Packaging and Transport of Nuclear Substances Regulations
- Transport Canada/Transportation of Dangerous Goods Act / TDG Regulations
- MOU in place since 1981 to coordinate and minimize overlap

CNSC and Transport Canada staff at Vancouver Port in 2011

Transport Of Nuclear Substances

- Over 10 million packages safely transported each year worldwide
  - Approximately 3 millions in USA
  - Approximately 2.5 millions in Europe
  - Approximately 1 million in Canada
- Represents less than 3 percent of the total of all dangerous goods transported
- On average, 30 percent of those packages are excepted packages (i.e., the lowest risk)

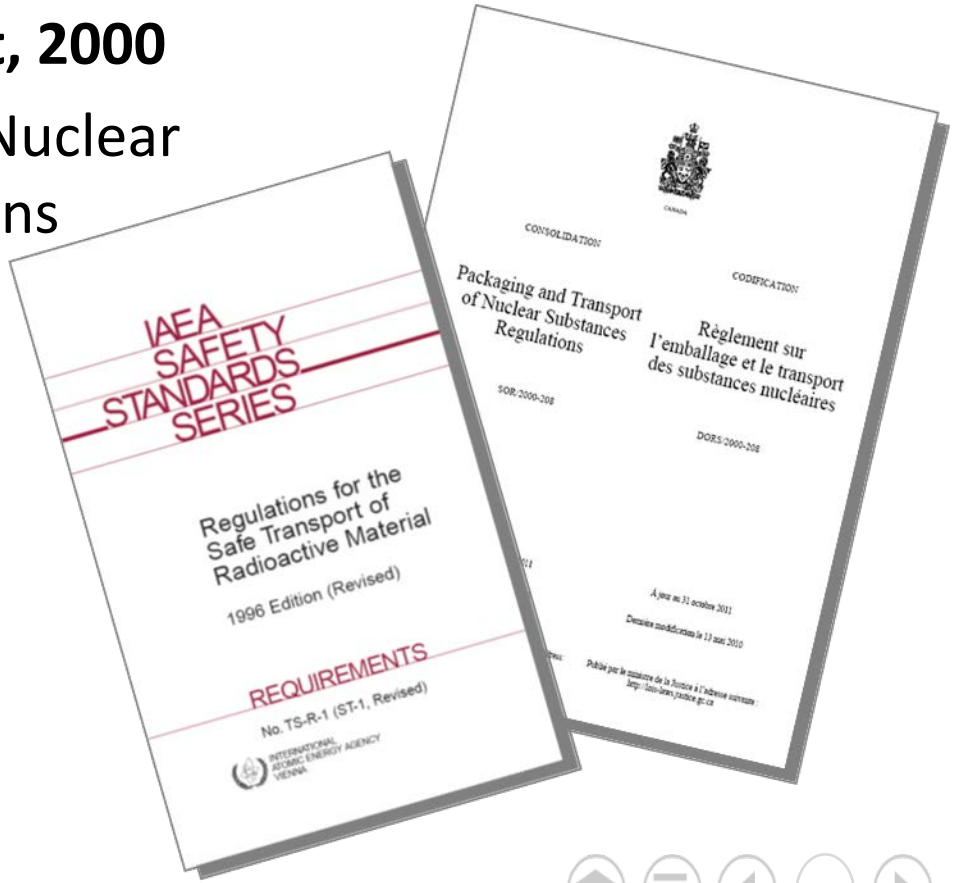
Global Nature of Nuclear Transport



Regulatory Basis: CNSC

Nuclear Safety and Control Act, 2000

- Packaging and Transport of Nuclear Substances (PTNS) Regulations
    - PTNS Regulations are based on the IAEA TS-R-1 Regulations



Transportation Involves Carriage of Nuclear Substances for:

- Movement of radioactive waste
- Shipment of nuclear fuel cycle material
- Industrial Use
- Medical Use
- Research

Transport Regulations

- Objectives of the Transport Regulations is to protect the health and safety of persons and the environment – emphasis on **package safety**
- Use graded approach in limiting radioactive contents based on types of package – the greater the radioactivity = the more **robust** is the package
- CNSC certification is required for certain types of packages

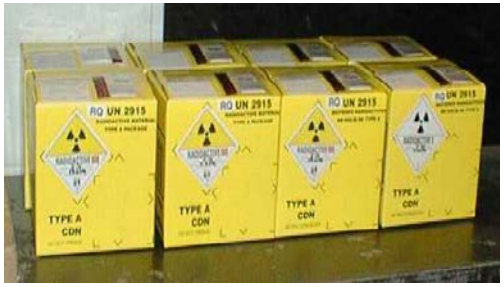
Approvals Required

- Package Design Certificate
- Licence to Transport
- Registered User

Types of Packages

Excepted Package

Industrial Package



Type A Package

Type B Package for Co-60

Type B Package for Medical Isotopes

Fissile Material Package

Tests Required for a Type B Package

- Type B packages are designed to withstand accidents in transport
- Simulated by cumulative effects of:
  - Free drop onto an unyielding surface from a height of 9 metres
  - Puncture test (package dropped from a height of 1 metre on a bar)
  - Thermal test (800 ^{o}C for 30 minutes)
  - Water immersion test (15 metres for 8 hours)

Responsibilities (consignors/shipper)

- The **consignor** is responsible for:
  - Selecting the proper package type
  - Preparing the package for shipment
  - Displaying proper safety marks
  - Preparing the shipping documents
  - Preparing Emergency Response Plan
  - Provide the carriers any additional information required during transport
  - Reporting Incident
  - Ensuring Radiation Protection and TDG training for workers
  - Maintaining records

Enforcement

- The responsibility for the enforcement of transport regulations, including class 7, is shared between:
    - Federal inspectors (CNSC and TC) and
    - Provincial/Territorial inspectors

Conclusion

- In Canada, more than a million packages are transported each year
- Basic philosophy: safety is built in the packages
- Regulations are largely independent of the mode of transport
- Package design is not dependent on the end use (nuclear fuel cycle or medical applications) rather on the radionuclides transported
- In Canada, not many shipments of used nuclear fuel; worldwide it is routinely done. In U.S., over 3,000 shipments since the mid 60s
- Historically, overall safety record has been excellent
- Safety record is backed by stringent regulatory regime

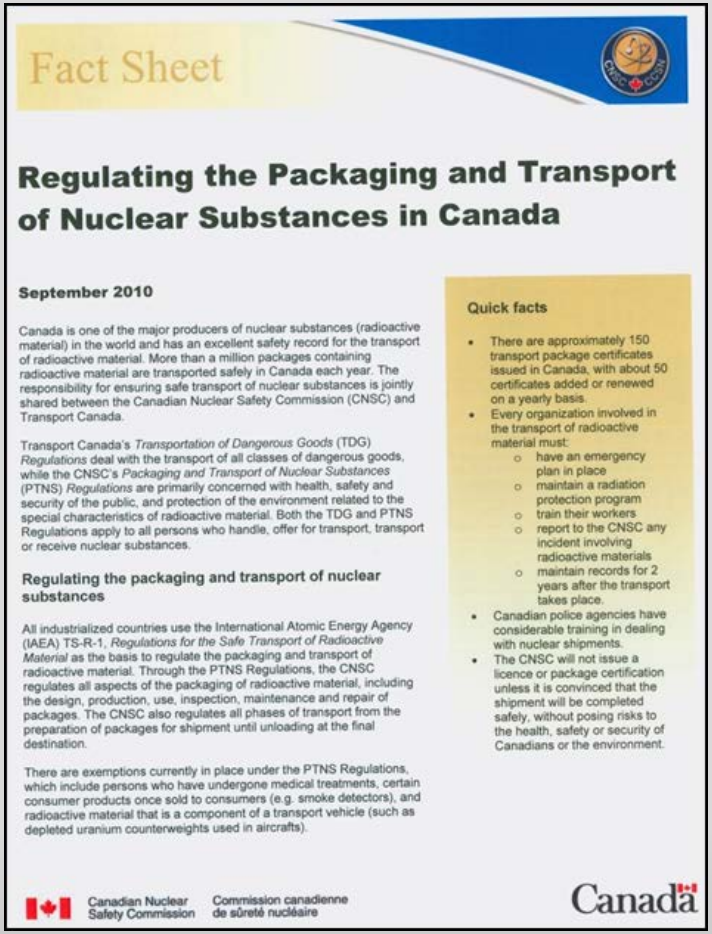
Additional Information

- Packaging and Transport of Nuclear Substances Regulations

http://laws.justice.gc.ca/eng/regulations/sor-2000-208

- Regulating the Packaging and Transport in Canada Fact Sheet

http://www.nuclearsafety.gc.ca/eng/readingroom/factsheets/packaging-and-transport-of-nuclear-substances.cfm



Fact Sheet

Regulating the Packaging and Transport of Nuclear Substances in Canada

September 2010

Canada is one of the major producers of nuclear substances (radioactive material) in the world and has an excellent safety record for the transport of radioactive material. More than a million packages containing radioactive material are transported safely in Canada each year. The responsibility for ensuring safe transport of nuclear substances is jointly shared between the Canadian Nuclear Safety Commission (CNSC) and Transport Canada.

Transport Canada's *Transportation of Dangerous Goods* (TDG) *Regulations* deal with the transport of all classes of dangerous goods, while the CNSC's *Packaging and Transport of Nuclear Substances* (PTNS) *Regulations* are primarily concerned with health, safety and security of the public, and protection of the environment related to the special characteristics of radioactive material. Both the TDG and PTNS Regulations apply to all persons who handle, offer for transport, transport or receive nuclear substances.

Regulating the packaging and transport of nuclear substances

All industrialized countries use the International Atomic Energy Agency (IAEA) TS-R-1, *Regulations for the Safe Transport of Radioactive Material* as the basis to regulate the packaging and transport of radioactive material. Through the PTNS Regulations, the CNSC regulates all aspects of the packaging of radioactive material, including the design, production, use, inspection, maintenance and repair of packages. The CNSC also regulates all phases of transport from the preparation of packages for shipment until unloading at the final destination.

There are exemptions currently in place under the PTNS Regulations, which include persons who have undergone medical treatments, certain consumer products once sold to consumers (e.g. smoke detectors), and radioactive material that is a component of a transport vehicle (such as depleted uranium counterweights used in aircrafts).

Quick facts

- There are approximately 150 transport package certificates issued in Canada, with about 50 certificates added or renewed on a yearly basis.
- Every organization involved in the transport of radioactive material must:
  - have an emergency plan in place
  - maintain a radiation protection program
  - train their workers
  - report to the CNSC any incident involving radioactive materials
  - maintain records for 2 years after the transport takes place.
- Canadian police agencies have considerable training in dealing with nuclear shipments.
- The CNSC will not issue a licence or package certification unless it is convinced that the shipment will be completed safely, without posing risks to the health, safety or security of Canadians or the environment.

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire
Canada

TRANSPORT OF RADIOACTIVE MATERIAL: OVERVIEW OF EMERGENCY PREPAREDNESS

Michael Callighen, Licensee Emergency Programs Division
Emergency Management Programs Division

Emergency Preparedness

- Multi-jurisdictional responsibility in Canada shared by all levels of government including the licensee
- Class I Facilities
  - Includes plans for both on-site and off-site emergencies
    - plans are reviewed by the CNSC
  - Programs are updated over the life of the facility
- Licensee subject to exercises and drills and assessed by CNSC

Emergency Preparedness

- Exercises and drills, assessed by CNSC staff

Emergency Preparedness

- Exercise and drills, multi-organization coordinated responses

Emergency Preparedness

- Exercises and drills, high-tech telecommunications equipment

Emergency Response: CNSC

- CNSC have Duty Officers available 24/7 to reach a Transport Specialist who can assist and provide guidance to first responders and persons involved in the remediation of an accident involving Class 7

- The CNSC can activate its Emergency Operation Centre as required in case of a major nuclear accident

Emergency Response: CNSC

- First responders to transport accidents are typically local firefighters and police officers
- CNSC provides training to local firefighters for incidents involving radioactive material
- In the event of serious accidents, CNSC staff may travel to the site to provide guidance

Emergency Response: Consignors

- Transport regulations require consignors to provide a 24/7 emergency telephone number on shipping documents
- Consignors must be able to provide information to first responders about the goods being transported
- Consignors are responsible for their goods involved in accidents

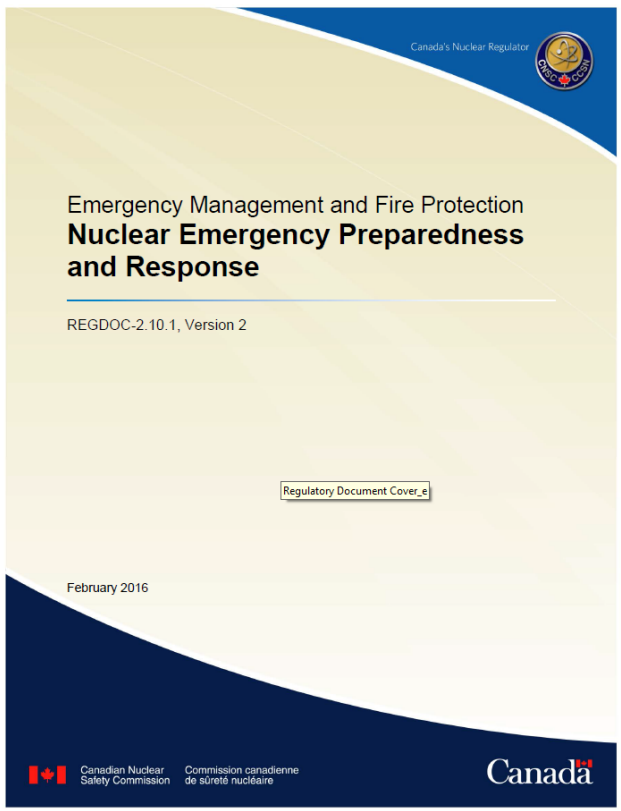
Emergency Response: Transport Canada

- **Transport Canada established the Canadian Transport Emergency Center (CANUTEC)**
  - 24/7 emergency center
  - Staffed by chemists and biologists that can provide technical information to first responders about goods being transported
  - Direct contact with CNSC Duty Officers

Additional Information

- Nuclear Preparedness and Response REGDOC 2.10.1

http://www.nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/history/regdoc2-10-1.cfm



TRANSPORTATION SECURITY USED NUCLEAR FUEL

Yves Poirier, Security Advisor
Nuclear Security Division

Transport – Used Nuclear Fuel

- The transportation of used nuclear fuel is regulated jointly by the CNSC and Transport Canada

- In order to transport used nuclear fuel in Canada a transportation security plan is required

Transportation Security Plan

- The primary purpose of a transportation security plan is to assure that the nuclear material to be transported will receive adequate physical protection against any threats during its transport

- The CNSC reviews and approves transport security plans

Transportation Security Plan

- The requirements for a transportation security plan are set out in section 5 of the Nuclear Security Regulations

Transportation Security Plan Requirements

- Complete description of material being transported – name, quantity, radiation level
- Threat assessment – to identify any credible threats
- Description of the conveyance – type of vehicle
- Proposed security measures – escort, continuous tracking

Transportation Security Plan Requirements

- Communication arrangements – between the carrier and the response force (ex: OPP)
- Arrangements between the licensee and any response force
- Primary and alternate routes

Prescribed Information

- Current regulations prohibit the public disclosure of security information on:
  - Location, routing and timing of shipments of used fuel
  - Any security arrangements or procedures specific to the transport of used nuclear fuel
  - The dissemination of Prescribed Information is limited to persons with a legitimate "need-to-know" such as police agencies

Nuclear Material Shipments

- Nuclear material shipments occur within Canada on a regular basis
- These same shipments have required an approved transport security plan
- Various Canadian police agencies (ex: OPP, RCMP) have considerable experience in dealing with nuclear shipments

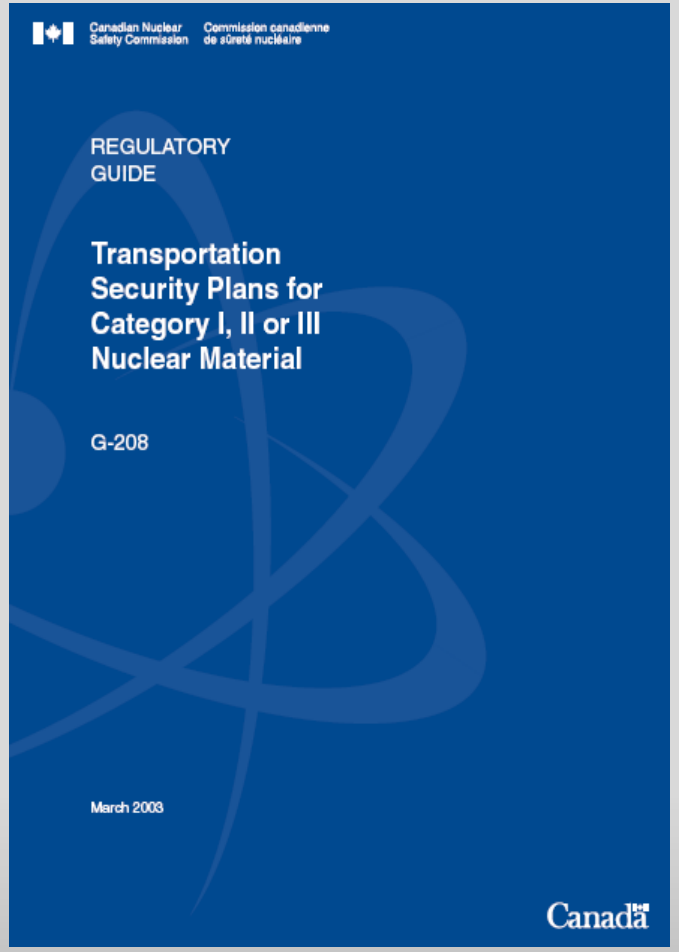
Additional Information

- Nuclear Security Regulations

http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/SOR209.pdf

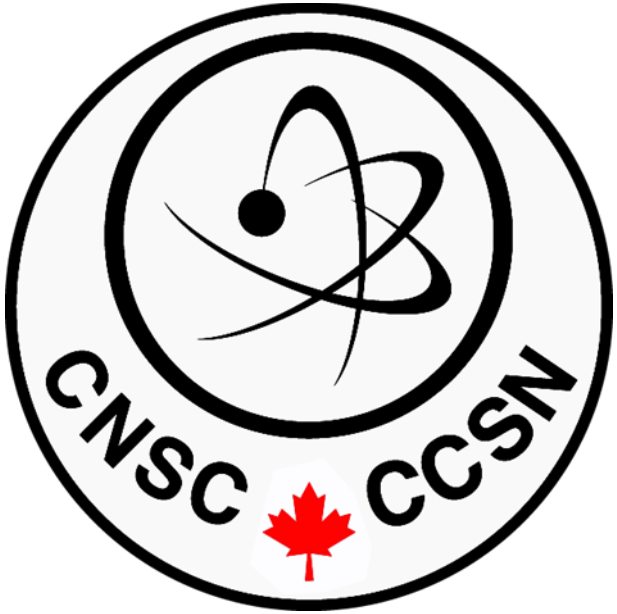
- CNSC Regulatory Guide G-208, Transportation Security Plans for Category I, II or III Nuclear Material

http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G208_e.pdf



Concluding Comments

- CNSC is Canada's nuclear regulator
- CNSC is responsible for the licensing, compliance and enforcement of the radioactive waste management facilities in Canada
- Overall safety record of the transport of nuclear substances in Canada has historically been excellent
- Protection of workers, the public and the environment is top priority
- There is a co-operative approach to relations with other agencies



We Will Not Compromise Safety