THE TRANSPORT OF RADIOACTIVE MATERIALS IN CANADA

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SUMMARY

The Canadian Government is revising the nuclear regulatory agency's Act and supporting regulations and is expected to put them into force late in 1998. This Act will change the Atomic Energy Control Board's name to the Canadian Nuclear Safety Commission [CNSC]. The revised regulations made by the CNSC will continue to follow the recommendations of the IAEA for transportation of radioactive materials and will adopt the radiological exposure limits in ICRP 60.

NEW ACT AND NEW NAME

The Atomic Energy Control Board [AECB] is the national regulator controlling the use and transport of nuclear material in Canada. The mandate of the AECB is contained in the *Atomic Energy Control Act* that originated in 1946 and was amended in 1954. The regulatory portion of the old Act is being replaced by the *Nuclear Safety and Control Act* that became law in March 1997 but will not come into force until supporting regulations have been approved. The emphasis in the new Act changes from national security to health, safety, security and protection of the environment. The Atomic Energy Control Board will be renamed the *Canadian Nuclear Safety Commission* to clearly differentiate it from the national nuclear research, development and marketing organization, Atomic Energy of Canada Limited [AECL]. Promotional parts of the old Act that created AECL will be retained in a statute called the *Nuclear Energy Act*.

NEW REGULATIONS

Twelve new sets of regulations, presently near the end of the public review and comment process, will support the new Act. Among the twelve, new *General Regulations* will be applicable to all those items of a general nature that have not been included directly in the Act. This allows for increased flexibility as regulations are much easier to change in Canada. Another of the twelve, the *Transport Regulations*, will replace the Transport Packaging of Radioactive Materials Regulations that have been in effect for many years. The transport regulations will consist of an administrative framework that incorporates, by direct reference, the essential requirements of IAEA Safety Series 6, "*Regulations for the Safe Transport of Radioactive Materials 1985 Edition, As Amended 1990*." Previously, the IAEA transport requirements written into the Canadian regulations were based on the 1973 edition [AA79].

Following public review and comment of the supporting regulations, the new *Nuclear Safety and Control Act* and the twelve sets of supporting regulations are expected to come into force sometime in late 1998. A complete listing of the new regulations is included in the references to this paper.

Transport requirements applicable to all dangerous goods will continue to be regulated by the *Transport of Dangerous Goods Regulations* administered by Transport Canada. A country-wide, 24-hour emergency response centre that provides emergency information on all types of dangerous goods supports those regulations and coordinates expert advice on incidents and accidents. For radiation incidents and accidents, the response centre may call upon AECB staff to provide advice.

EVOLUTIONARY NOT REVOLUTIONARY

AECB staff has been reviewing and accepting package certifications and endorsements that conform to the IAEA transport requirements for many years. Most of the changes from a transportation perspective under the new act and regulations may be viewed as evolutionary rather than revolutionary. This is also true of other areas with the major change being the use of the latest recommendations of the ICRP [ICRP 60] for radiological exposure limits.

While use of IAEA Safety Series 6-85 (As Amended 1990), has been allowed for some time, the new *Transport Regulations* will make these requirements mandatory. The structure of the new regulations will also make the introduction of updated IAEA transport regulations easier. *Regulations for the Safe Transport of Radioactive Material* [ST-1] will be introduced in a subsequent round of revisions.

The existing Board, consisting of up to five members, will be expanded to a permanent seven-member Commission. The President of the Commission, as the chief executive officer, will be a full-time member while the others may be either full or part-time for five-year terms. The government may also appoint temporary members for a period not exceeding six months. The Commission will be a court of record with defined legal powers.

The powers and responsibilities of inspectors are thoroughly defined. For example, an inspector may order a licensee to take any measure necessary to protect the environment or the health or safety of persons.

The Commission may also make regulations, with the approval of the Governor in Council, over the full range of nuclear activities and may enter into agreements with any person, any department or agency of the Government of Canada or of a province, any regulatory agency or department of a foreign government, or any international agency as needed to achieve its objectives.

Any person directly affected may appeal decisions or orders of designated officers or inspectors of the Commission. The Commission may amend, renew, revoke, or replace a licence or licence condition(s), vary or cancel suspensions and may hear any new evidence supporting an appeal.

The protection of the environment is perhaps the most significant addition to the Commission's responsibilities. From a transport perspective, where safety is engineered into

package design and usage, one could argue that the Board has always been protecting the environment.

Fines for offences have increased a hundredfold from the original act. Where an offence is committed over more than one day, it may be deemed a separate offence.

The new *General Regulations* contain requirements for the content of licence applications, obligations of licensees and workers, licence exemptions, contamination limits, prescribed equipment, prescribed information, and reporting, record keeping and descriptions of the certificates provided to inspectors and designated officers of the CNSC. For example, the prescribed limit for contamination of a place or vehicle is defined as any quantity of a nuclear substance that would increase a person's effective radiological dose by one millisievert or more per year in excess of background radiation for that place or vehicle.

TRANSITION

During the transition phase, many transportation certificates and endorsements will expire. We intend to renew transport package certifications as they expire, subject to cost recovery guidelines as detailed below. Therefore, endorsements or certificates referencing our old name and old act will remain valid until their expiry date.

DIFFERENCES IN CANADA

Generally, the Canadian *Transport Regulations* follow those of the IAEA. However, we differ in the following areas:

- All shippers will still have to obtain a Canadian endorsement for Type B and fissile packages before use in Canada or for transit through Canada. This requirement has been in effect for many years.

- A transit licence will be required for Type B and fissile packages in addition to the Canadian endorsement.

- All users of Type B and fissile transport packages will continue registering with the CNSC. Consignors and consignees will be licenced to package and transport certified packages under their radioisotope or their facility licence.

- To contend with natural ore bodies in Canada with high uranium and thorium concentrations, LSA-I materials will have different definitions from those in IAEA SS6 Paragraph 131, which will limit ore concentrations to 2 per cent by mass.

- Tritiated water as LSA-II material will have a maximum volume limit of 225 litres per package (drum) for concentrations not exceeding 0.8 TBq/L.

- The A_1 and A_2 values for Molybdenum 99 will be decreased to 0.8 TBq.

- Another group of materials such as mill tailings and waste with an average specific activity less than 10^{-6} A_2/g will be included as LSA-I materials.

- The alternate qualification method using the ISO standards for Type 2 or Type 3 freight containers includes the changes detailed in the 1996 IAEA transport regulations.

- Exemptions from the transport regulations will include bioassay samples, human or animal tissue or liquid scintillation mediums where the activity is less than 10^{-6} A_2/kg averaged over the mass of the material. Exemptions are also provided where a licence is not required to possess or use a radioactive material and the activity is less than 10^{-3} A_2, or for material that is an integral part of the conveyance and is required for transport purposes.

- The CNSC will not grandfather packages qualified to the 1967 regulations.

MODAL IMPACT

The new *Transport Regulations* require the consignor and consignee to comply with the general obligations in the IAEA regulations, including the need to maintain and apply approved radiation protection and quality assurance programs. As this has been an international requirement for many years, most consignors and consignees already have these measures in place.

The Transport Regulations also specify the duties and obligations of carriers, consignors and persons who control the area affected by a dangerous occurrence. Among those requirements is the need to limit the spread of radioactive contamination. The new regulations also provide a definition of accidental releases for the *Transport of Dangerous Goods Act* of 1992.

Approval to use certified Type B or fissile transport packages as a registered user was required under the old regulations and is formalized under the new regulations. This registration, as distinct from the package design and manufacture approval that is commonly called the package certification, is normally obtained by the shipper (consignor). Registration is a means to ensure that all parties using the device have the information to properly prepare a package {transport, receive, unpack and maintain the package}. There are approximately 125 Type B and fissile package certificates valid in Canada, including 50 foreign endorsements.

Applications for certification or endorsement of transport packages under the new regulations must follow IAEA SS6 provisions. The new transport regulations will also require thirty days notice of intention by the CNSC to decertify certified packages, special arrangement shipments or special form radioactive material [SFRM], unless public health and safety are jeopardized. Similarly, notification of a proposed decision not to certify a new package, special arrangement shipment or SFRM will also require thirty days' notice. All decisions will be open to the right to be heard.

PERSONNEL

The Atomic Energy Control Board employs approximately 430 staff. The Materials Regulation Division employs 53 technical and professional personnel who review and inspect applications and issue licences or certificates for transport packages, accelerators, medical facilities and radioisotope devices. The Transportation Section consists of a supervisor, three

engineers, one full-time administrative assistant, and one full-time inspector. Additional help is provided by two inspectors who also inspect radioisotope licensees, one part-time engineer and one part-time clerk. Specialist advice is available from other AECB staff on an as-needed basis in areas such as criticality analysis, quality assurance audits and radiation protection assessments. Engineering advice is provided to other parts of the Division mainly for the review of radiation devices as transport packages.

COST RECOVERY

Since 1989, most activities of the AECB have been subject to *Cost Recovery Fees Regulations*. Under these regulations, all technical reviews for transport packaging are charged on an hourly basis. Where package design or content has changed, review fees are charged. Otherwise, renewal is free.

TRAINING

Training on the new Act and regulations for designated officers, inspectors and clerks is already underway. Part of the inspectors' and officers' retraining will address legal powers and obligations. The right to search and seizure under our Criminal Code is one such defined power. Understanding the new duties and obligations of their positions and those of their colleagues is also part of that training. Expected completion of the corporate training cycle is late 1998.

CONCLUSIONS

As a major producer and shipper of radioactive materials, Canada is an active participant in the support of organizations including the IAEA and the international modal organizations responsible for the regulation of air and sea transport. A 1992 transport survey reported approximately one million radioactive shipments in Canada annually, excluding excepted packages.

The adequacy of the existing regulations is reflected in the small number of nonconformances, approximately 20 shipping incidents a year. Similar or better levels of performance are expected from the Transport Regulations under the new Nuclear Safety and Control Act.

References

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