

We will never compromise safety
Nous ne compromettrons jamais la sûreté



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire



Briefing on the Safe Transport of Steam Generators

Presentation to Nuclear Law
Committee of the Nuclear
Energy Agency (OECD)

Presented by

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Safety Commission

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Canada 

Canadian Nuclear Safety Commission



Established May 2000, under the
Nuclear Safety and Control Act

Replaced the AECB of the 1946
Atomic Energy Control Act



Celebrating our 65 years of nuclear safety!

Independent Commission



- ✦ Quasi-judicial administrative tribunal
- ✦ Reports to Parliament through Minister of Natural Resources Canada
- ✦ Commission members are independent
- ✦ Commission hearings are public and Webcast
- ✦ Decision can only be reviewed by Federal Court



Transparent, science-based decision-making



The Application

- ❖ Application for a transport licence under a “special arrangement”, under section 5 of the *CNSC Packaging and Transport of Nuclear Substances Regulations (PTNS)*
- ❖ Transport by ship of 16 decommissioned steam generators (SGs) from Ontario, Canada to Studsvik, Sweden
- ❖ Purpose is to have the SGs recycled, with the non-contaminated steel separated from the contaminated components
- ❖ Contaminated components to be shipped back to Canada for storage – result in 90% smaller environmental footprint

In line with CNSC policy on waste reduction

How is the Transport of Nuclear Substances Regulated?



- ✦ Transport of all nuclear substances is governed by:
 - International Atomic Energy Agency (IAEA) *TS-R-1 Regulations for the Safe Transport of Radioactive Material*
 - *International Maritime Dangerous Goods Code*
- ✦ In Canada, these regulations are applied through:
 - CNSC's *Packaging and Transport of Nuclear Substances Regulations (PTNS)*
 - Transport Canada's *Transportation of Dangerous Goods Regulations (TDG)*
- ✦ Sweden and the US
 - follow the same IAEA Regulations and will independently evaluate the application, taking into consideration the CNSC decision

Any transport that is required to be compliant with such rigorous regulations would be the safest shipment on the St. Lawrence

How are nuclear substances transported?



Millions of shipments of nuclear substances in Canada each year

In Montreal alone, each year:

- Over 9,000 shipments pass through the Pierre-Elliott Trudeau Airport
- Over 1,050 shipments pass through the Port of Montreal
- Over 50,000 medical isotope shipments within the City of Montreal

***No precedent is being set.
This is routine activity.***

Dangerous goods are transported regularly on the St. Lawrence Seaway and Great Lakes



In 2009

Substance	Quantity (tonnage)
Gasoline	481,813
Road fuel & petroleum oils	638,177
Toluene	8,583
Urea	82,509
Calcium nitrate	3,006
Calcium ammonium nitrate	10,000
Urea ammonium nitrate	78,999
Alcohol industrial	4,785
Fertilizers	3,245
Asphalt	462,823
Biofuels	14,045
Muriate of potash	21,273
Calcium chloride liquid	53,901
Sulphuric acid	20,893
Tar pitch and creosote	38,213
Low specific activity radioactive material	7,000

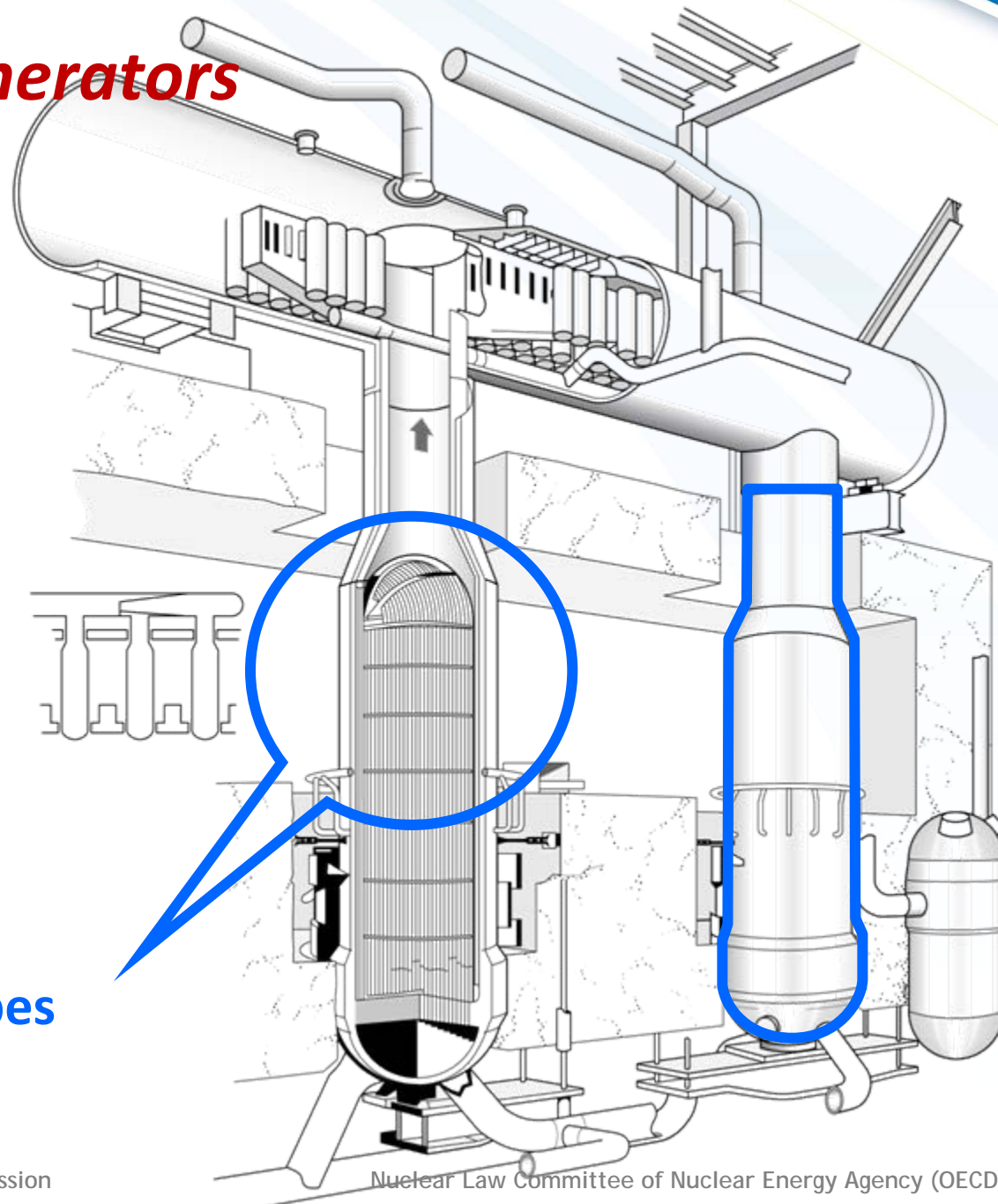


Steam Generators



100 tons of steel but less than 4g of radioactive substances

Steam Generators

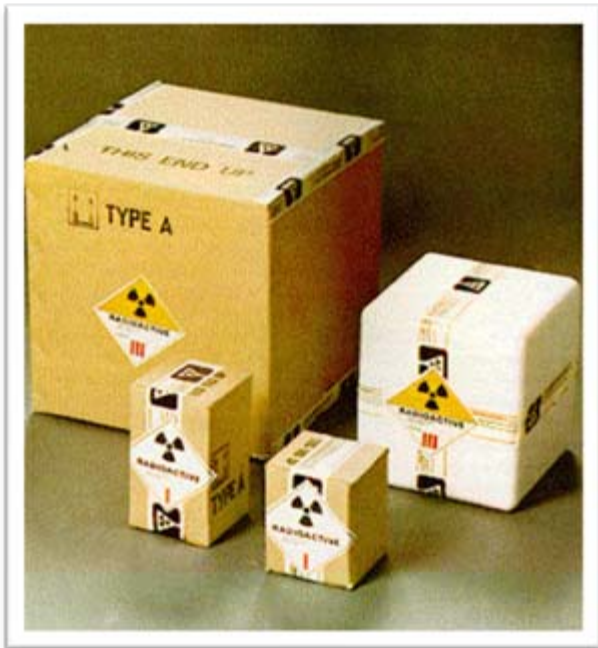


Inner tubes

Radiation Dose Rate in Perspective



Medical isotopes



~ 0.5 mSv/hr

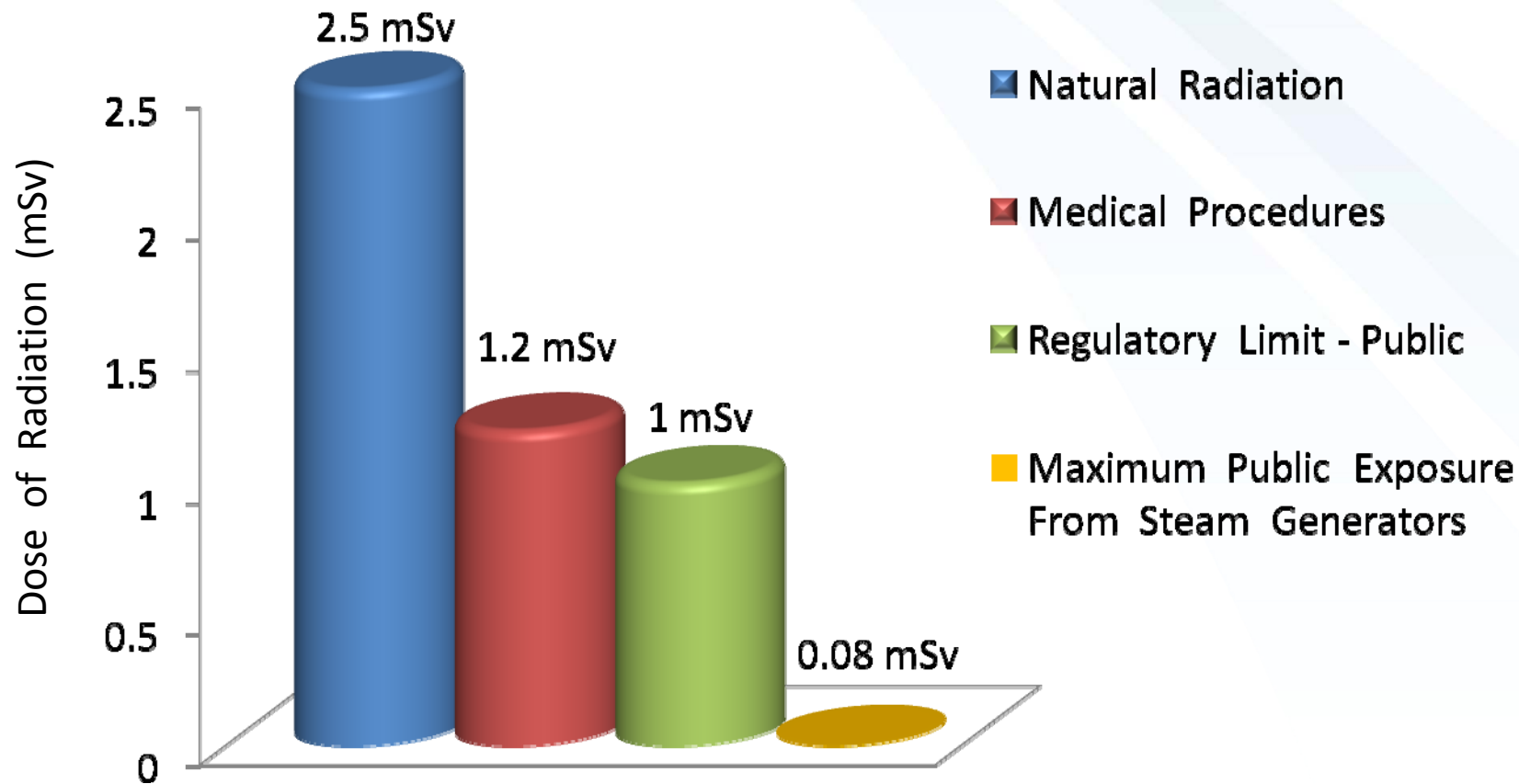
Steam generators



0.08 mSv/hr

Safe to be around

Radiation in Perspective

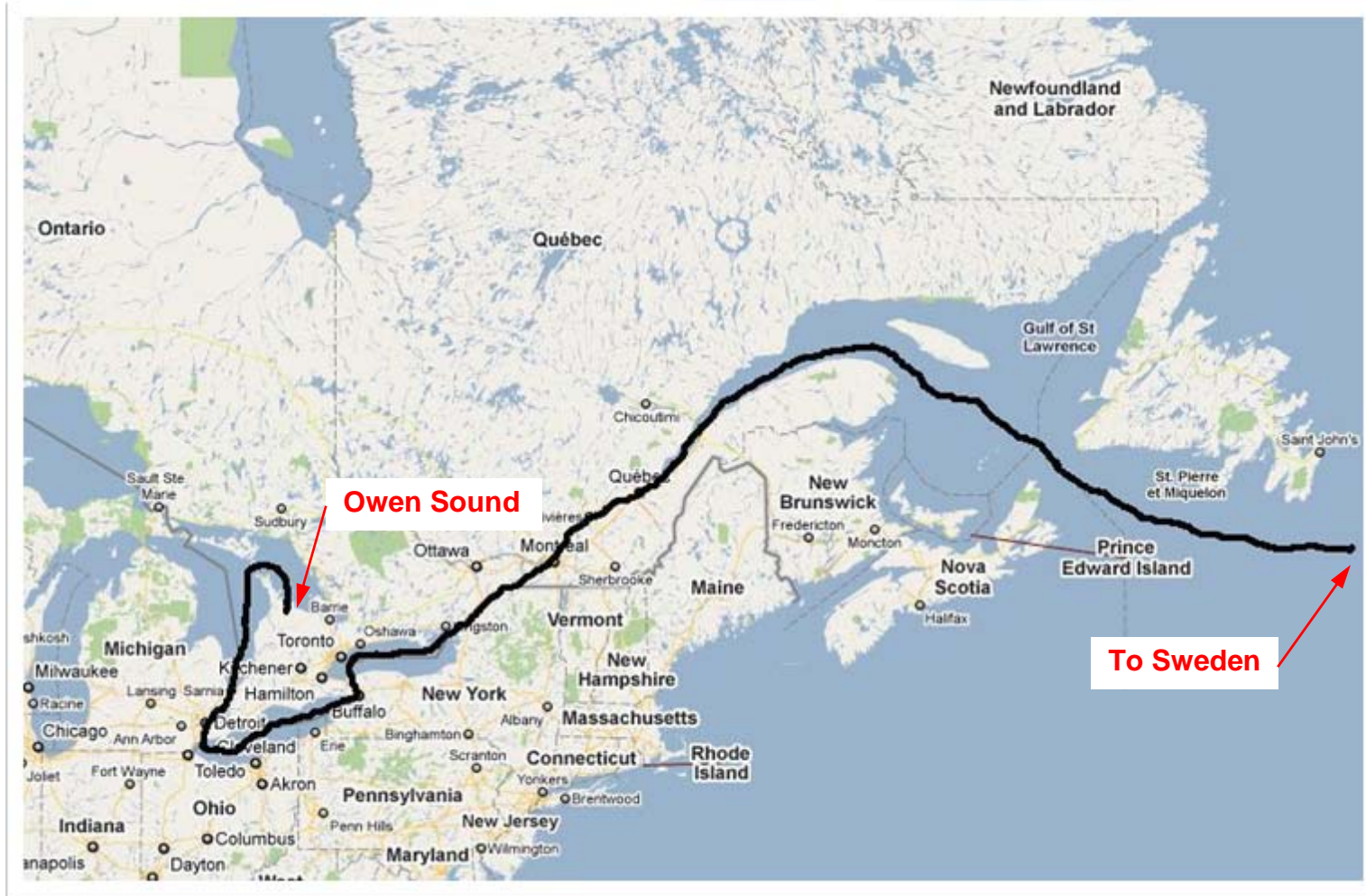


Transport Packages – Special Arrangement



Due to their size, the steam generators do not fit in approved package; hence, the need for a special arrangement licence.

Route within Canada and the US



Route from Canada to Sweden



CNSC Staff thoroughly evaluated the following safety areas



- 1. Packaging and transport**
- 2. Protection of the environment**
- 3. Radiation protection**
- 4. Emergency measures**
- 5. Security**

1. Packaging and Transport: Marine Transport

- ❖ Transport saddles welded to the floor of the cargo hold
- ❖ No other cargo on board
- ❖ Ship only loaded to 25% capacity
- ❖ Ship crew is trained in radiation safety and emergency measures

Conclusion: Commission concluded that packaging and transport comply with all national and international requirements

2. Protection of the Environment (1)



- ✿ Protection of the environment is a statutory mandate under the *Nuclear Safety and Control Act* (NSCA)
- ✿ The CNSC has to fulfill the requirements of the *Canadian Environmental Assessment Act* (CEAA) before making a licensing decision under the NSCA
- ✿ Proposed packaging and transport of 16 steam generators did not require an EA under the CEAA because the proposed activity is not a “project” as defined by the CEAA
- ✿ A thorough evaluation of the potential effects of this activity on the environment and the health of workers and of the public was conducted under the NSCA



2. Protection of the Environment (2)

- ❖ The evaluation conducted under the NSCA covered all the requirements of the CEAA
- ❖ Evaluated multiple potential accident scenarios including worst-case scenarios for a credible marine accident
- ❖ In a very unlikely worst case accident the public dose would be less than 1% of the public dose limit of 1 mSv/year

Conclusion: CNSC staff conclude that the environmental and human health risk from a release from an accident would be negligible

3. Radiation Protection

- ❖ The programs meet the CNSC requirements.
- ❖ Doses to workers from all 16 steam generators will be less than 2% of public dose limit.
- ❖ Negligible dose to people driving or walking by the steam generators while they are transported by road.

Conclusion: The dose to members of the public would be less than 0.1 % of the limit for members of the public which is negligible



4. Emergency Measures

- ❖ Bruce Power's emergency response plan
- ❖ The shipboard emergency plan is compliant with International Maritime Organization Regulations

Conclusion: The emergency measures to protect the health and safety of workers and the public are adequate

5. Security

- ❖ **Owen Sound Port** – Transport Canada provides regulatory direction/oversight for security measures
- ❖ **Marine vessel** – Transport Canada provides regulatory direction/oversight for security measures
- ❖ **Marine Security Operations Centre (MSOC)** will coordinate the threat and risk assessment for the marine part of this shipment
- ❖ **MSOC** is led by the RCMP and consists of a broad range of law enforcement and public safety agencies with responsibilities for marine security including Transport Canada, Canadian Coast Guard, Ontario Provincial Police and the Sûreté du Québec

Conclusion: The security measures are adequate



Commission Decision Process

- ❖ Initially, CNSC Designated Officer decision
 - CNSC staff assessment – very low risk
 - CNSC Designated Officer approval required
- ❖ Commission public hearings in September 2010
 - Respected public interest and concerns
 - Nature of risk did not change, only perception
 - 77 interventions
- ❖ Commission requested clarification on a few points
 - 32 supplementary submissions
- ❖ Comprehensive analysis of many important issues

Careful analysis and public engagement



The Commission's Decision

- ❖ Negligible health and safety risk to the public, the workers and the environment
- ❖ Potential environmental impacts were examined
- ❖ Regulatory requirements met or exceeded
- ❖ Comprehensive analysis of many important issues
- ❖ Licence valid for one year, expires in February 2012

All requirements met, with negligible risk



The Swedish Regulator's Decision

- ❖ The Swedish Radiation Safety Authority (Stralsakerhetsmyndigheten – SSM) recently issued certificate for approval of the special arrangement
- ❖ SSM is competent authority under 7 Fj 1 Regulations (2006:3 11) on the Transport of Dangerous Goods
- ❖ Expiry date of February 3, 2012 (same as Canada)
- ❖ Reasons for decision same as Canada

Consistent findings in Canada and Sweden

Legal Considerations (1) – Special Arrangement



- ❖ Size of generators and non-access to interior did not allow them to be in certified package – needed “special arrangement” (paragraph 825 of IAEA Regulations)
- ❖ Commission was satisfied that:
 - SGs are correctly classified as Surface Contaminated Object (SCO) Group 1 (SCO1);
 - industrial package Type 1 (Type IP-1) packaging requirements are met or exceeded; and
 - the proposed shipment meets or exceeds the safety requirements for SCO-1 material
- ❖ While conveyance limits could have been exceeded, proposed compensatory measures would have ensured shipment met requirements for a special arrangement

Meets or exceeds safety requirements

Legal Considerations (2) – Return Shipment



- ❖ Return waste would require an export licence from Sweden and import licence from Canada
- ❖ 100% of waste to be returned to Canada
- ❖ No need for a transport licence if packaged in accordance with regulatory requirements

No transport licence for return waste

Legal Considerations (3) – Liability



- ❖ Commission of the view that *Nuclear Liability Act* (NLA) applies to the radioactive component of the shipment (within Canada’s territorial limits) as material was “combined, mixed or associated” with nuclear fuel
- ❖ Commission notes that comprehensive general liability insurance covers non-nuclear hazards
- ❖ Bruce Power responsible for shipment to Sweden; Studsvik under contractual obligation to maintain adequate insurance coverage for any potential incidents

NLA and CGL would provide complete coverage

Legal Considerations (4) – Aboriginal Consultation



- ❖ Crown's (government) Duty to Consult Aboriginal people is a recognized legal requirement in Canada
- ❖ Obligation is imposed on government (in this case the CNSC), but can be partly satisfied by licensee's consultation activities.
- ❖ Commission satisfied with level of consultation and that no impact on existing Aboriginal rights
- ❖ Commission is of the view Duty was not triggered and, that if triggered, was adequately discharged
- ❖ No challenge to date; CNSC already involved in other litigation regarding Duty to Consult

Duty to Consult met

Legal Considerations (5) – Environmental Assessment (EA)



- ❖ The CNSC determination that the transportation of the SGs is not a “project” under *Canadian Environmental Assessment Act* (CEAA) is being challenged before the Federal Court of Canada by two NGOs
- ❖ The judicial review application is expected to be heard in fall 2011
- ❖ The CNSC is seeking to intervene in this matter
- ❖ A finding by the Court that the transportation is a project necessitating an Environmental Assessment under the CEAA could have a significant impact on the transport of nuclear materials in Canada

Legal Considerations (6) – International Shipment



- ❖ Shipment must comply with IAEA *Regulations for the safe transport of radioactive material (TS-R-1)* and the *International Maritime Dangerous Goods Code*
- ❖ Must also obtain approvals from all countries where shipment pass through. In this case, approvals necessary from Canada, USA Department of Transportation and Swedish Radiation Safety Authority.
- ❖ No need for approval from UK, Norway and Denmark as outside boundaries

Comply with international requirements

Regulatory Environment



- ❖ Fukushima incident is impacting this file
- ❖ Bruce Power withdrew its transport licence application in USA
- ❖ CNSC licence will likely expire prior to actual transport
- ❖ SGs will likely remain in storage at current waste management site until social acceptability has improved
- ❖ *Nuclear Liability Act* likely to be amended – liability insurance cap to be significantly increased

Everything nuclear is in flux

Conclusion



- The Commission in rendering its decision stated it is satisfied that the transport:
 - can be completed safely and that risk to persons and the environment are negligible
 - the shipment meets all Canadian and international regulations and requirements
 - Bruce Power is qualified to carry out the project.
- Shipping the generators will recycle 75% of the metal mass. This is in accordance with CNSC waste policy
- Shipping the generators will reduce the environmental footprint by 90%. This is good nuclear waste management

Conclusion: The shipment of 16 steam generators from Bruce Power to Sweden is safe



Questions?

nuclearsafety.gc.ca



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