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Security in Safety
The Transport of Nuclear Fuel Cycle Material

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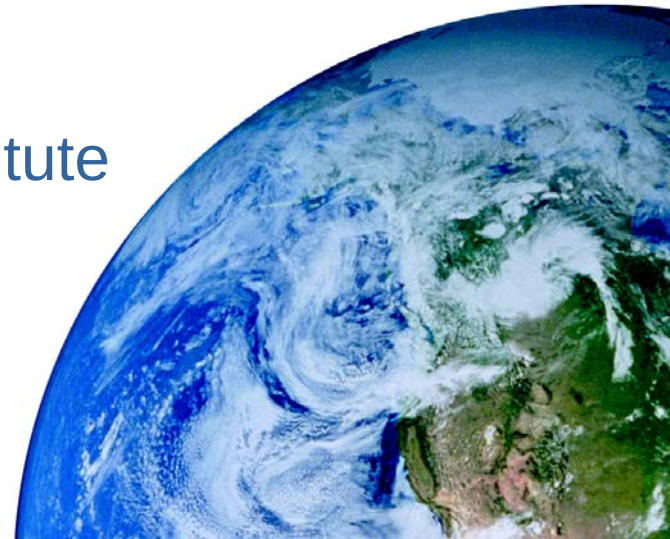

Points covered

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- Security Measures
- The United Nations Model Regulations
- Additional Security for Maritime Transports
- Industries Concerns
- Assessment of the Risk
- Burden on Industry
- Conclusion

Security Measures

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- Security
  - is the various measures to guard against malicious acts
  - is mainly responsibility of the States involved
- Transport industry must comply with State Security regulations

- Transports of Nuclear Fuel Materials
  - Subject to extensive national protection measures including
    - Design of the transport vehicle
    - Use of security forces
    - Employee screening
    - Satellite tracking

Security Measures

- Physical protection measures for international transports include
  - Limiting the time in transit
  - Varying the routes used
  - Avoiding bottle necks
  - Limiting the knowledge of the shipments on a “need to know basis”

Security Measures

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- Since 2001 interest has shifted to all nuclear fuel cycle materials including
  - HLW
  - MOX
  - Fuel assemblies
- All these materials are transported by dedicated
  - Vessels
  - Rail or road wagons
- Routes have to be approved by the competent authorities in the countries concerned

IAEA- Nuclear Security Series No 9

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- In the past the IAEA main focus was on safety so this was a major change in direction for the IAEA and the industry.
- In 2002 work began on developing security requirements for all radioactive materials
- 2008 publication Nuclear Security Series No 9 “Security in the Transport of Radioactive Materials”

United Nations

- The United Nations Model Regulations contain provision for
  - basic security measure for all dangerous goods
  - enhanced security measures for *high consequence dangerous goods*
    - *high consequence dangerous goods include*
      - *dangerous chemicals*
      - *flammable liquids*
      - *gasses*
      - radioactive materials in type B and C packages

Security for High Consequence Dangerous Goods

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- **Provisions for high consequence dangerous goods**
  - competent authorities shall consider
    - identifying consignors or carriers engaged in the transport of high consequence
- ***Security plans***
  - Carriers, consignors and others engaged in the transport shall adopt a security plan that includes
    - Allocation of security responsibilities
    - Records of dangerous goods transported
    - Assessment of vulnerabilities
    - Statements of measures, including training, policies to respond to higher threat conditions, new employee verification

Security for High Consequence Dangerous Goods

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- Choice of routes
- Equipment and resources that are to be used to reduce security risks
- Procedures for reporting and dealing with security threats
- Breaches of security or security incidents
- Procedures for the evaluation and testing of security plans
- Measures to ensure that the distribution of the transport information is limited as far as possible.

Sea Transports

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- Additional Security for Maritime Transports
  - International Maritime Organisation
    - International Ship and Port Facility Security Code
      - Security for the ports and shore side
    - Amendments to the Safety of Life at Sea Convention
      - Long range identification and tracking of ships
    - The 2005 Protocol to the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, 1988
      - states that a person commits an offence

Suppression of Unlawful Acts Against the Safety of Maritime Navigation

- uses against or on a ship or discharging from a ship any radioactive material in a manner that causes or is likely to cause death or serious injury or damage;
- transports on board a ship any radioactive material, knowing that it is intended to be used to cause death or serious injury or damage
- transports materials knowing that it is intended to be used in a nuclear explosive activity or in any other nuclear activity not under safeguards
- transports any equipment, materials or software that significantly contributes to the design, manufacture or delivery of a BCN weapon, with the intention that it will be used for such purpose.
- The transportation of nuclear material is not considered an offence if such items or materials are transported under the control of a State Party to the Treaty on the Non Proliferation of Nuclear Weapons

Three Instruments & The Transport Industry

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- Three International Instruments
  - INFCIRC 225
    - Nuclear materials with a potential to produce a nuclear device
  - UN Model Regulations for high consequence dangerous goods (HCDG)
    - All dangerous goods consider to have a grave consequence if used maliciously
  - IAEA Security in the Transport of radioactive materials
    - All radioactive materials in transport

Industries Concern

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- UN Model Regulations
  - High consequence radioactive materials
    - 3000 A1 for large sources
    - 3000 A2 for other radioactive materials
- IAEA Security in the Transport of Radioactive Materials
  - Enhanced security level
    - Radioactive sources (CoC)10D
    - Other materials – 3000 A2

Industries Concern

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- Difference in values for enhanced security levels
- Transporters do not understand D values

- Lack of harmonisation
  - IAEA v UN
    - At least for the next 4 years
  - Governments
    - Inconsistency between government requirements
    - Especially for international land transports crossing several territories

Assessment of the Risk

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- Perceived risk
  - it is important to make and communicate a realistic assessment of the danger and the real risk
  - taking into account the properties of the material and the packaging used
  - exaggerated perceptions in the minds of public and politicians could have a serious impact on the transport industry and the supply chain
  - In the event of an incident proper communication of the real danger is essential

Risk assessment

- Risks are manageable
  - Un-irradiated materials present low radiological hazard
    - Unlikely targets
    - Radiological consequences would not be severe
  - Highly radioactive materials
    - Metallic, ceramic, or vitreous
      - Not easily dispersed
      - Transported in vary robust packages
- Packages and the transport system are designed to ensure safety but they also provide security from realistic terrorist activities

Burden on Industry

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- Many new requirements
  - Advance notice
    - This could increase the security threat
  - Monitoring
    - GPS, RFID
  - Escorts
  - Personnel screening (Dock worker)
  - Additional training
  - Container screening

- All adding additional cost which may lead to

Denial and delays to vital transports

Conclusion

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- Several international instruments already apply to the transport of nuclear fuel materials
- But there is a lack of harmonisation
- The real risk - not a perceived risk must be presented
- The packaging used is very robust
- The materials are not easily dispersed
- Additional burdens on the transport system could lead to more denials and delays

- Thank you for your attention