



New York City, NY, USA
24–28 March 2024 (Sess. 1)
1–5 April 2024 (Sess. 2)



International Atomic Energy Agency Background Guide 2024

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Dear Delegates,

Welcome to the 2024 National Model United Nations New York Conference (NMUN•NY)! We are pleased to introduce to you our committee, the International Atomic Energy Agency (IAEA). Your committee's work is facilitated by volunteer staffers. This year's committee staff are: Director Anthony Bassey and Assistant Director Harrison Baile (Session 1), and Director Paul Gussmann and Assistant Director Malaika Singh (Session 2). Anthony Bassey studied Biological Sciences at Arkansas State University, and currently works for the American Red Cross as a Caseworker with the Service to the Armed Forces team. Harrison Baile is currently a Master's student at the University of Saskatchewan and has a background in security policy. Paul Gussmann is in the final stages of his Master's in Economics, works for the German state-owned bank KfW, and co-founds a start-up. Malaika Singh acquired a Bachelor's degree in International Studies at De La Salle University-Manila and currently works for an NGO that focuses on migrant advocacy and immigrant protection. The preparation of these materials was supported by Under-Secretaries-General Maïke Weitzel (Session 1) and Martin Schunk (Session 2).

The topics on the agenda for this committee are:

1. Maintaining and Strengthening Emergency Preparedness and Response
2. Improving the Safe and Secure Transport of Radioactive Material

This Background Guide serves as an introduction to the topics for this committee. However, it is not intended to replace individual research. We encourage you to explore your Member State's policies in depth and use the bibliography to further your knowledge on these topics. In preparation for the conference, each delegation should submit a Position Paper by 11:59 p.m. ET on 1 March 2023 in accordance with the guidelines in the [Position Paper Guide](#) and the [NMUN•NY Position Papers website](#).

Two resources, available to download from the NMUN website, serve as essential instruments in preparing for the Conference and as a reference during committee sessions:

- The [NMUN Delegate Preparation Guide](#), which explains each step in the delegate process, from pre-conference research to the committee debate and resolution drafting processes. Please take note of the information on plagiarism, and the prohibition on pre-written working papers and resolutions.
- The [NMUN Rules of Procedure](#), which includes the long and short form of the rules, as well as an explanatory narrative and example script of the flow of procedure.

In addition, please review the mandatory [NMUN Conduct Expectations](#) on the NMUN website. They include the conference dress code and other expectations of all attendees. We want to emphasize that any instances of sexual harassment or discrimination based on race, gender, sexual orientation, national origin, religion, age, or disability will not be tolerated. If you have any questions concerning your preparation for this committee, please contact the Deputy Secretaries-General at dsg.ny@nmun.org.

We wish you all the best in your preparations and look forward to seeing you at the Conference!

Anthony Bassey, Director
Harrison Baile, Assistant Director
Session 1

Paul Gussmann, Director
Malaika Singh, Assistant Director
Session 2



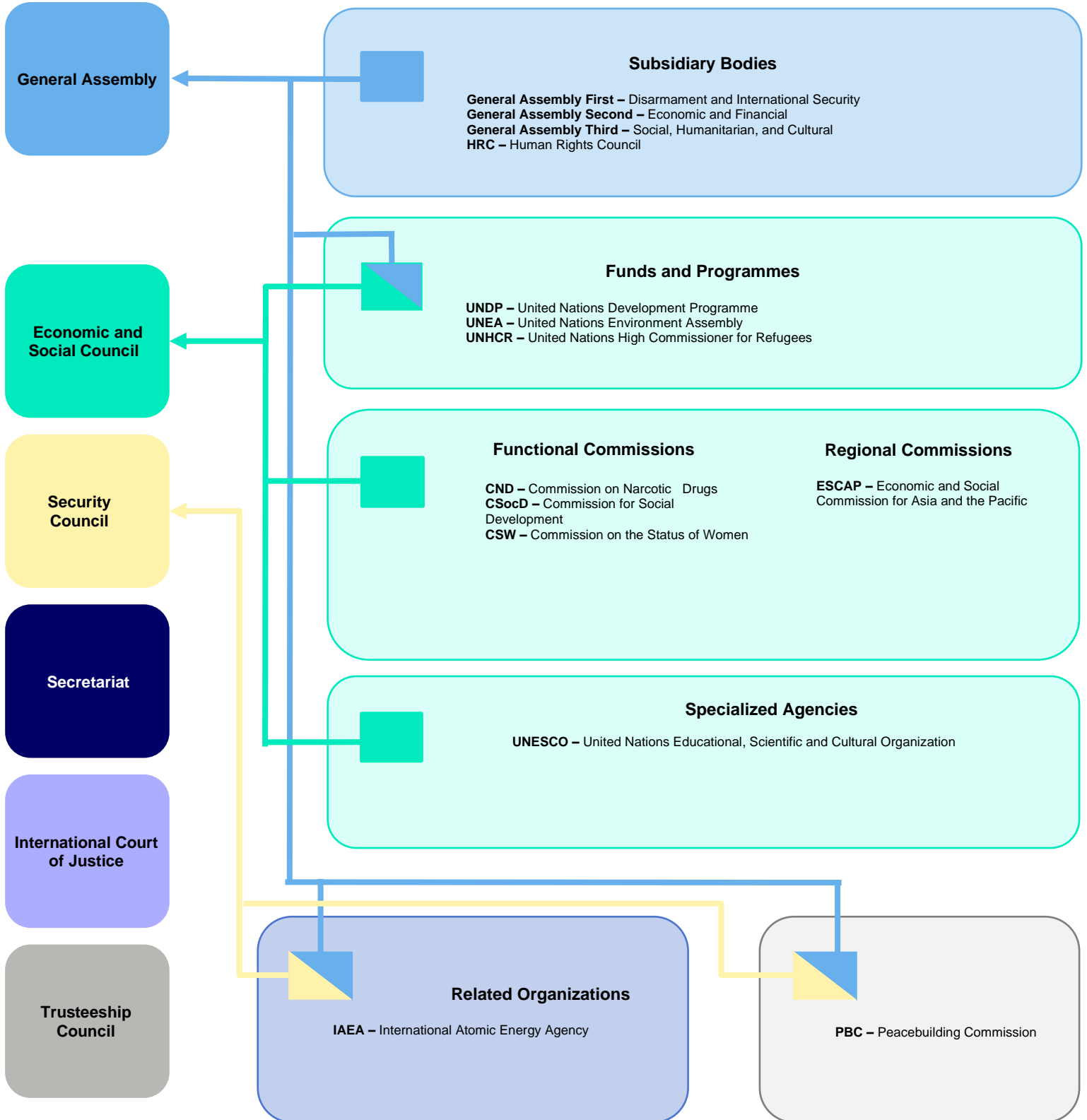
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United Nations System at NMUN·NY

This diagram illustrates the United Nations system simulated at NMUN·NY. It shows where each committee “sits” within the system to demonstrate the reportage and relationships between entities. Examine the diagram alongside the Committee Overview to gain a clear picture of the committee’s position, purpose, and powers within the United Nations system.





Committee Overview

Introduction

The International Atomic Energy Agency (IAEA) is an independent intergovernmental organization that works closely with the United Nations and was founded “in response to the deep fears and expectations resulting from the discovery of nuclear energy.”¹ The primary aim of the IAEA is to guarantee the peaceful use of nuclear material.² The agency has a dual purpose: to advance nuclear technology and spread knowledge on effective and sustainable usage of nuclear energy while simultaneously preventing the usage of nuclear material for atomic weapons and non-peaceful purposes.³

The work of the IAEA has been crucial in the development of nuclear security standards that allow the peaceful use of nuclear technologies and guarantee the protection of human health and the environment.⁴ The IAEA’s principal focus is in addressing current security challenges and ensuring the continuous political will of its members, but it also works to support efforts to achieve the Sustainable Development Goals (SDGs), including through its subsidiary programs, such as the Peaceful Uses Initiative (PUI) and the Zoonotic Disease Integrated Action (ZODIAC).⁵ The PUI that was launched in 2010 and aims to finance unfunded projects in the area of peaceful usage of nuclear technologies, and provide additional financial support to projects that foster technical cooperation.⁶

Mandate, Function, and Powers

According to article 2 of the *IAEA Statute* (1956), the IAEA aims to “accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world” and thus, the primary role of the IAEA is to ensure that atomic energy is used for safe, secure, and peaceful purposes.⁷ The mandate is further defined by the provisions of the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT) (1968), which established binding international law on the non-proliferation of nuclear weapons, the disarmament of existing nuclear weapons systems, and the advancement of peaceful nuclear technology, thereby defining the tasks and responsibilities of the IAEA.⁸

While the following list is not exhaustive, the mandate of the IAEA can be summarized as:

- The IAEA **will generally**: assist with and surveil the peaceful use of atomic energy through the provision of research and technical assistance; make provisions about the standards for materials, services, equipment, and facilities to conduct research and produce nuclear power; encourage and assist in the exchange of information, training, and scientists, acquiring the facilities, plants, and equipment necessary to conduct its tasks and responsibilities; examine facilities and equipment, including sending inspectors to Member State facilities and to request progress reports from those states; request information on health and safety standards, and the production and recovery of fissionable materials; take steps to sanction states that are non-compliant IAEA provisions, including suspending or terminating IAEA assistance or withdrawing material and equipment provided by the agency.⁹

¹ Fischer. *History of the International Atomic Energy Agency: The first Forty Years*. 1997. pp. 1-3; New Zealand Ministry of Foreign Affairs and Trade. *United Nations Handbook 2023-24*. 2023. pp. 378-384.

² International Atomic Energy Agency. *IAEA Statute*. 1989.

³ Llukmani. *International Atomic Energy Agency. General Conference: Day 5 Highlights*. 2021; International Atomic Energy Agency. *Atoms for Peace and Development: How the IAEA supports the Sustainable Development Goals*. 2015.

⁴ International Atomic Energy Agency. *The IAEA Mission Statement*. 2023.

⁵ Kamishima. IAEA Bulletin. *Ten years of the IAEA Peaceful Uses Initiative*. 2020.

⁶ Ibid.

⁷ International Atomic Energy Agency. *IAEA Statute*. 1989.

⁸ United Nations, General Assembly. *Treaty on the Non-Proliferation of Nuclear Weapons (A/RES/2373 (XXII))*. 1968.

⁹ International Atomic Energy Agency. *IAEA Statute*. 1989.



- The IAEA **will not generally**: certify a Member State's compliance with safeguards or try to predict a Member State's future intentions regarding its nuclear program; take enforcement action with regards to safeguard inspections; make decisions about actions to be taken against the Member States not complying with safeguards.¹⁰

Additional functions of the IAEA are set out in article 3 of the NPT, which obliges States Parties to accept safeguard provisions agreed upon between the Member State and the IAEA in accordance with the provisions outlined in the *IAEA Statute* and the NPT.¹¹ The IAEA is responsible for supervising and ensuring compliance with the established safeguard provisions, including the prevention of the misuse of nuclear material for non-peaceful usage, such as nuclear weapons or other explosive nuclear devices, and the supervision of the production, possession, and usage of fissionable material.¹² Finally, the *IAEA Statute* established the IAEA's reporting requirements to United Nations bodies, including annual reports to the General Assembly, reports to the Security Council if needed, and reports to other organs on matters relating to their area of work.¹³

Governance, Structure, and Membership

The General Conference, attended by all IAEA Member States, is the highest policy body of the IAEA and meets annually.¹⁴ The General Conference discusses and makes decisions on matters within the scope set in the *IAEA Statute*, including the election of the Board of Governors, the approval of applications for membership, the appointment of the Director-General, and deciding on changes to be made to the *IAEA Statute*.¹⁵ Additionally, the General Conference considers the annual report of the IAEA, votes on the budget suggested by the Board of Governors, adopts reports submitted to the United Nations, approves agreements made between the IAEA and the United Nations or other organizations, and has the power to suspend Member States.¹⁶

The Board of Governors, which consists of 35 representatives of IAEA Member States elected by the General Conference, meets five times each year, makes recommendations to the General Conference concerning the IAEA's accounts, actions, and budget, and considers applications for IAEA membership.¹⁷ The board also prepares the IAEA's annual report on the activities and actions of the agency, which is presented to the General Conference each year.¹⁸ Overall, the board is responsible for carrying out the work of the IAEA as outlined in the Statute and according to its responsibilities to the General Conference.¹⁹

¹⁰ Priest. IAEA Bulletin. *IAEA safeguards and the NPT: Examining interconnections*. 1995. pp. 10-11.

¹¹ United Nations, General Assembly. *Treaty on the Non-Proliferation of Nuclear Weapons (A/RES/2373 (XXII))*. 1968.

¹² Ibid.

¹³ International Atomic Energy Agency. *IAEA Statute*. 1989.

¹⁴ International Atomic Energy Agency. *General Conference*. 2023.

¹⁵ International Atomic Energy Agency. *IAEA Statute*. 1989.

¹⁶ Ibid.

¹⁷ International Atomic Energy Agency. *Board of Governors*. 2023.

¹⁸ International Atomic Energy Agency. *IAEA Statute*. 1989.

¹⁹ Ibid.



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United Nations, General Assembly. *Treaty on the Non-Proliferation of Nuclear Weapons (A/RES/2373 (XXII))*. 1968. Retrieved 20 October 2023 from: [http://www.undocs.org/en/A/RES/2373\(XXII\)](http://www.undocs.org/en/A/RES/2373(XXII))



1. Maintaining and Strengthening Emergency Preparedness and Response

Introduction

Nuclear incidents require only a few hours to become catastrophic, and as such, nuclear installations require a reliable and timely response system.²⁰ Nuclear energy provides around 10% of the world's energy.²¹ As of 2023, there are just 440 nuclear reactors providing power worldwide, however, when there is an accident at a nuclear power plant or its structural integrity is put at risk, the potential harm of radiation exposure to people and the environment is great.²² Under Article 3 of its statute, the International Atomic Energy Agency (IAEA) is empowered to create safety standards and safeguards for nuclear material.²³ IAEA considers emergency preparedness and response (EPR) as a fundamental safety principle and a foundational aspect of nuclear safety.²⁴ IAEA encourages regional cooperation to coordinate emergency response through its platforms for knowledge sharing and guidance materials.²⁵ While IAEA does not currently operate early warning systems, Member States can better prepare for emergencies through consistent and standardized procedures provided in the IAEA's safety guidelines.²⁶ As a result, IAEA partners with Member States to develop and test their nuclear safety standards and procedures, including emerging areas of risk like maritime nuclear incidents.²⁷

When a nuclear reactor, nuclear fuel, or nuclear waste is involved in an emergency situation, it poses a significant hazard to the environment and population.²⁸ The Chernobyl disaster of 1986 was a catalyst event that brought forth the dangers of nuclear accidents to the international community, as IAEA found that 26 people died due to fatal doses of radiation along with an estimated 6000 cases of thyroid cancer due to radioactive tainted milk.²⁹ In response to this accident, IAEA developed international agreements for EPR.³⁰ Currently, IAEA is involved in monitoring the situation at the Zaporizhka Nuclear Power Plant (ZNPP) in Ukraine.³¹ This includes the assessment and ongoing monitoring of the impacts of the conflict in Ukraine on the EPR capabilities of ZNPP.³² However, IAEA has faced difficulties supporting Ukraine's efforts to maintain nuclear safety and safeguards due to the amount of equipment needed and damages to the ZNPP resulting from the armed conflict.³³

IAEA has established specific definitions of terms related to nuclear material and EPR in the IAEA Nuclear Safety and Security Glossary.³⁴ IAEA defines emergency response as actions that mitigate the

²⁰ International Atomic Energy Agency. *IAEA Highlights How Emergency Preparedness and Response Information Management System Strengthens Countries' Preparedness for Emergencies*. 2022.

²¹ World Nuclear Association. *Nuclear Power in the World Today*. 2023.

²² Center for Disease Control and Prevention. *Nuclear Power Plant Accidents*. 2019; World Nuclear Association. *Nuclear Power in the World Today*. 2023.

²³ Conference on the Statute of the International Atomic Energy Agency. *Statute of the International Atomic Energy Agency*. 1956. pp. 5-7.

²⁴ International Atomic Energy Agency. *Fundamental Safety Principles: Safety Fundamentals*. 2006. p. 14.

²⁵ International Atomic Energy Agency. *IAEA Highlights How Emergency Preparedness and Response Information Management System Strengthens Countries' Preparedness for Emergencies*. 2022.

²⁶ International Atomic Energy Agency. *Emergency preparedness and response*. 2023.

²⁷ International Atomic Energy Agency. *A Test of International Cooperation in Emergency Preparedness at Sea*. 2023.

²⁸ International Atomic Energy Agency. *International Atomic Energy Agency Background Document On Chernobyl*. 2023. p. 1.

²⁹ *Ibid.* p. 2.

³⁰ International Atomic Energy Agency. *International framework*. 2023.

³¹ International Atomic Energy Agency. *Nuclear Safety, Security and Safeguards in Ukraine (GOV/2023/30)*. 2023. p. 2.

³² *Ibid.* p. 14.

³³ *Ibid.* pp. 18, 20, 27.

³⁴ International Atomic Energy Agency. *IAEA Nuclear Safety and Security Glossary*. 2022.



negative impacts of nuclear and radiological hazards to life and the environment.³⁵ Emergency preparedness consists of procedures and the ability to mitigate the damage of a nuclear accident.³⁶ IAEA considers any location that handles, produces, or stores nuclear material as a nuclear facility, including nuclear reactors and nuclear power plants.³⁷ The term nuclear material comprises irradiated fuel, Plutonium, and specific types of Uranium.³⁸ IAEA classifies nuclear material for nuclear weapons separately from non-weapons grade nuclear material.³⁹

EPR allows Member States and the international community to prepare for nuclear accidents and mitigate damage if an accident occurs.⁴⁰ IAEA defines a nuclear accident as an accident in which radiation from the accident crosses country borders.⁴¹ This makes nuclear accidents transnational emergencies.⁴² In contrast, nuclear or radiological emergencies are emergencies with risks from radioactive hazards but do not specifically cross borders.⁴³

International and Regional Framework

The Chernobyl Nuclear Disaster resulted in IAEA and its Member States developing the first two international treaties on nuclear EPR, namely the *Convention on Early Notification of a Nuclear Accident* (1986) and the *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency* (Assistance Convention) (1986).⁴⁴ Both conventions are the foundational frameworks for EPR for IAEA and its networks.⁴⁵ The *Convention on Early Notification of a Nuclear Accident* (Early Notification Convention) (1986) sets out the responsibilities of a Member State in the event of a nuclear accident occurring within its borders.⁴⁶ These responsibilities include notifying other Member States that may be impacted and providing necessary information, such as protective measures taken and the facility where the accident took place.⁴⁷ The Assistance Convention sets out the requirements for cooperation that IAEA and signatories to the convention must provide in the event of a nuclear accident or emergency.⁴⁸ Member States requesting support must specify what they require.⁴⁹ The responding Member States must then respond with what support they can provide the requesting Member State with.⁵⁰ Member States and IAEA enact these conventions in the event of any type of radiological emergency.⁵¹

In 1994, IAEA adopted the *Convention on Nuclear Safety*, which established high safety standards for nuclear power plants.⁵² Member States committed to adhering to the safety practices outlined in the convention and on reporting their progress, adopting the safety practices in joint signatory review

³⁵ Ibid. p. 72.

³⁶ Ibid. p. 71.

³⁷ Ibid. p. 135.

³⁸ Ibid. p. 138.

³⁹ Ibid. p. 138.

⁴⁰ International Atomic Energy Agency. *Emergency preparedness and response*. 2023.

⁴¹ International Atomic Energy Agency. *IAEA Nuclear Safety and Security Glossary*. 2022. p. 68.

⁴² Ibid. p. 10; International Atomic Energy Agency. *IAEA Nuclear Safety and Security Glossary*. 2022. p. 68.

⁴³ International Atomic Energy Agency. *IAEA Nuclear Safety and Security Glossary*. 2022. p. 68.

⁴⁴ International Atomic Energy Agency. *Convention on Early Notification of a Nuclear Accident (INFCIRC/335)*. 1986.; International Atomic Energy Agency. *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (INFCIRC/336)*. 1986.

⁴⁵ International Atomic Energy Agency. *International framework*. 2023.

⁴⁶ International Atomic Energy Agency. *Convention on Early Notification of a Nuclear Accident (INFCIRC/335)*. 1986.

⁴⁷ Ibid. pp. 4-5.

⁴⁸ International Atomic Energy Agency. *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (INFCIRC/336)*. 1986.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ International Atomic Energy Agency. *International Framework*. 2023.

⁵² International Atomic Energy Agency. *Convention on Nuclear Safety*. 1994. p. 3.



meetings.⁵³ These meetings are held at least every three years, with the 9th review meeting taking place in March 2023.⁵⁴ The *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* (1997) focuses on safely handling and disposing of spent nuclear fuel and nuclear waste.⁵⁵ Regarding emergency preparedness, the convention states that facilities with radioactive waste must have regularly tested, on-site and off-site emergency plans.⁵⁶ The *Treaty establishing the European Atomic Energy Community* (Euratom) (1952) is a European treaty that was established to promote the research of peaceful nuclear energy in Europe by the European Coal and Steel Community, the predecessor to the European Union (EU).⁵⁷ While all EU Member States are party to the Euratom treaty, Euratom is not an EU organ.⁵⁸ In the EPR context, Euratom provides standardized safety and protection standards across the EU.⁵⁹ The European Commission manages Euratom policy and safety standards, nuclear safety training is provided through the Euratom Research and Training Programme, and the Joint Research Center conducts safety research and development.⁶⁰

Role of the International System

IAEA and other organs of the United Nations provide various types of support to Member States for nuclear emergencies and emergency preparedness.⁶¹ For example, IAEA, France, and Denmark provided specialists to Lebanon after the Beirut explosion in 2020.⁶² The specialists helped determine if there were any radiological leaks and the safety and security of the radiological components of medical devices that may have been damaged as a result of the explosion.⁶³ Furthermore, IAEA has provided technical assistance and safety equipment to Ukraine to protect and monitor Ukrainian nuclear power plants under the Assistance Convention.⁶⁴

The Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE) facilitates international response to nuclear accidents or emergencies.⁶⁵ IAEA founded IACRNE in response to the 1986 Chernobyl disaster and facilitates emergency response between the United Nations and regional actors.⁶⁶ Parties to IACRNE are United Nations organs such as the World Health Organization (WHO), Food and Agriculture Organization, and the World Meteorological Organization.⁶⁷ Non-United Nations organizations such as the Nuclear Energy Agency (NEA), the European Union Agency for Law Enforcement Cooperation, and the International Criminal Police Organization (INTERPOL) are also part of IACRNE.⁶⁸ IACRNE is in charge of the Joint Radiation Emergency Management Plan of International Organizations

⁵³ Ibid. p. 3.

⁵⁴ Ibid. p. 8; International Atomic Energy Agency. *Joint Eighth and Ninth Review Meeting of the Contracting Parties to the Convention on Nuclear Safety (CNS) 2023*. 2023. p. 1.

⁵⁵ International Atomic Energy Agency. *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (INFCIRC/546)*. 1997. p. 8.

⁵⁶ Ibid. p. 24.

⁵⁷ European Union, Publications Office. *Treaty establishing the European Atomic Energy Community (Euratom)*. 2007.

⁵⁸ Ibid. 2007.

⁵⁹ Ibid. 2007.

⁶⁰ European Union, Publications Office. *Other Euratom services*. N.d.

⁶¹ International Atomic Energy Agency. *Coordination of inter-agency response*. 2023.

⁶² International Atomic Energy Agency. *IAEA Mission Detects No Radiation Increase in Beirut After Recent Blast*. 2020.

⁶³ Ibid.

⁶⁴ International Atomic Energy Agency. *Nuclear Safety, Security and Safeguards in Ukraine (GOV/2023/30)*. 2023. p. 20.

⁶⁵ International Atomic Energy Agency. *Coordination of inter-agency response*. 2023.

⁶⁶ Ibid.

⁶⁷ International Atomic Energy Agency, Inter-Agency Committee on Radiological and Nuclear Emergencies. *International Atomic Energy Agency, Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE)*. N.d.

⁶⁸ Ibid.



(JPLAN).⁶⁹ The plan establishes the framework for inter-agency coordination relating to preparedness and response and relevant international organizations' response capabilities, such as INTERPOL.⁷⁰

The requirements for EPR at the international level are implemented through three operational agreements.⁷¹ The Operations Manual for Incident and Emergency Communication (IEComm), the IAEA Response and Assistance Network (RANET), and JPLAN.⁷² IEComm sets out the operational requirements for both the Early Notification Convention and the Assistance Convention.⁷³ RANET is IAEA's mechanism to assist as required by the Assistance Convention.⁷⁴ RANET facilitates international assistance and is the Assistance Conventions operational mechanism.⁷⁵ JPLAN determines the role of each organization in the event of a nuclear accident.⁷⁶ For example, JPLAN states that in the initial phase of an emergency, IAEA's role is to notify stakeholder Member States and international organizations, while the International Maritime Organization is to inform vessels at sea that may be at risk due to the emergency.⁷⁷

The IAEA Incident and Emergency Center (IEC) acts as the nexus for international cooperation on EPR, providing a centralized response hub.⁷⁸ Due to the increased use of nuclear energy and nuclear materials worldwide, the risk of malicious use of said materials also increases, which was an additional risk that prompted IAEA to create IEC in 2005.⁷⁹ IEC acts as a 24/7 point of contact for Member States in the event of a nuclear emergency.⁸⁰ IEC provides, coordinates response and prevention efforts, and houses IAEA's Incident and Emergency System (IES).⁸¹ IES is the primary system of IEC to respond to nuclear emergencies.⁸² IEC is separated into four groups: the IES Preparedness Group is responsible for IEC emergency response exercises and IEC infrastructure; the IES Operations Group implements IAEA emergency response and RANET in the event of a nuclear accident; the Member States Preparedness Group assists Member States in developing and enhancing their nuclear emergency preparedness programs, including providing training for Member States and conducting reviews; the Emergency Communications and Outreach Group is the outreach arm of IEC, which also provides Member States with advice on public communication in the event of a nuclear emergency.⁸³ Other United Nations organs like WHO also have a role in EPR.⁸⁴ For example, WHO also developed standards such as the *Triage, Monitoring and Treatment (TMT) Handbook* in conjunction with regional- and state-level nuclear safety organizations.⁸⁵ The TMT Handbook provides tools and training for responding to a radiological or nuclear emergency caused by malevolent actors.⁸⁶

Euratom, through its subsidiary organ, the Joint Research Center, maintains its own nuclear emergency alert systems for the European region.⁸⁷ The European Community Urgent Radiological Information

⁶⁹ Ibid.

⁷⁰ International Atomic Energy Agency. *Incident and Emergency Center*. 2023.

⁷¹ International Atomic Energy Agency. *International operational arrangements*. 2023.

⁷² Ibid.

⁷³ Ibid.

⁷⁴ International Atomic Energy Agency. *IAEA Response and Assistance Network*. 2013. p. 13.

⁷⁵ International Atomic Energy Agency. *International operational arrangements*. 2023.

⁷⁶ Ibid.

⁷⁷ International Atomic Energy Agency. *Joint Radiation Emergency Management Plan of the International Organizations*. 2017. p. 7.

⁷⁸ International Atomic Energy Agency. *Incident and Emergency Center*. 2023.

⁷⁹ Ibid.

⁸⁰ International Atomic Energy Agency. *The Incident and Emergency Center (IEC)*. 2007. p. 4.

⁸¹ International Atomic Energy Agency. *Incident and Emergency Center*. 2023.

⁸² Ibid.

⁸³ Ibid.

⁸⁴ World Health Organization. *Triage, Monitoring and Treatment Handbook*. 2009. p. 1.

⁸⁵ Ibid.

⁸⁶ Ibid.

⁸⁷ European Union, Publications Office. *Joint Research Center: Work Programme 2023-2024*. 2023. p. 55.



Exchange System (ECURIE) acts as the EU's primary nuclear and radiological emergency alert and communication system.⁸⁸ ECURIE provides short-term notifications of nuclear emergencies within the EU.⁸⁹ NEA is an intergovernmental organization within the Organization for Economic Cooperation and Development (OECD) that focuses on helping members cooperate on developing nuclear energy capacity.⁹⁰ The NEA Working Party on Nuclear Emergency Matters (WPNEM) supports members in developing EPR. WPNEM also conducts exercises to help members prepare for nuclear emergencies.⁹¹ NEA is a member of the IAEA JPLAN network.⁹²

The private sector has several organizations that focus on EPR.⁹³ While standards set by the international community are for national nuclear regulators, government regulators set national safety standards for private nuclear operators.⁹⁴ The World Association of Nuclear Operators (WANO) is an association of private-sector nuclear energy operators such as the China General Nuclear Power Corporation and New Brunswick Power.⁹⁵ They provide peer review for standards and safety programs for members to improve safety at private nuclear operations.⁹⁶ The World Nuclear Transport Institute is a member organization for private-sector transport businesses that transport nuclear material.⁹⁷ They provide resources and information-sharing networks for regulations on nuclear material transportation.⁹⁸ IAEA and the private sector cooperate within several working groups and programs to promote the safe development and expansion of nuclear power.⁹⁹ IAEA provides guidance on IAEA safety standards to the private sector by participating in working groups like WANO's New Unit Assistance Working Group.¹⁰⁰

Maintaining International Nuclear and Radiation Safety Standards

In 2022, IAEA adopted resolution G(66)/RES/6 on "Nuclear and Radiation Safety" in which it emphasized the importance of having a universal standard for the operation and maintenance of nuclear installations to ensure the implementation of global nuclear safety.¹⁰¹ To further promote this, IAEA published its safety standards as a collection of guidance documents for all Member States with specific focus areas such as the operation of nuclear power plants and preparedness for radiological emergencies.¹⁰² IAEA maintains that the safety of nuclear installations is the responsibility of each Member State while encouraging international cooperation to ensure that universal standards are applied in their operation.¹⁰³ To address all aspects of nuclear safety, the IAEA Secretariat works with five safety standard committees composed of international experts that focus on nuclear safety, EPR, the safe handling of radioactive waste, and the safe transport of radioactive materials.¹⁰⁴ The IAEA Secretariat works with other international organizations including the International Labor Organization, OECD, NEA, and WHO to develop, update, and maintain these safety standards in accordance with technological development and

⁸⁸ Ibid.

⁸⁹ Ibid.

⁹⁰ Organization for Economic Cooperation and Development, Nuclear Energy Agency. *About Us*. 2020.

⁹¹ Ibid.

⁹² Ibid.

⁹³ World Association of Nuclear Operators. *Our Mission*. 2023.

⁹⁴ International Atomic Energy Agency. *Safety standards*. 2023.

⁹⁵ World Association of Nuclear Operators. *Our Mission*. 2023.; World Association of Nuclear Operators. *Who Are Our Members?* 2023.

⁹⁶ Ibid.

⁹⁷ World Nuclear Transport Institute. *About Us*. 2023.

⁹⁸ Ibid.

⁹⁹ International Atomic Energy Agency. *IAEA and WANO Team Up to Support New and Expanding Nuclear Power Programmes*. 2020.

¹⁰⁰ Ibid.

¹⁰¹ International Atomic Energy Agency. *Nuclear and Radiation Safety (GC(66)RES/6)*. 2022. pp. 5-7.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.



new technical information becoming available.¹⁰⁵ One of the goals of this partnership is to ensure inclusive input to publish comprehensive guidance documents.¹⁰⁶

While maintenance of active nuclear installations is important, disposal of radioactive waste can pose a threat to public safety when not properly managed because improper disposal can pollute the environment and cause health problems.¹⁰⁷ The safety standards for the classification of radioactive waste seek to ensure that Member States consider long-term safety when disposing of radioactive waste while taking into account its impact on the environment, persons, and wildlife.¹⁰⁸ They provide Member States with information on how to develop appropriate waste disposal facilities, modes of transport, and methods of disposal.¹⁰⁹ IAEA also supports Member States in the implementation of the *2030 Agenda for Sustainable Development* through the application of nuclear energy in providing potable water for communities as stated in Sustainable Development Goal (SDG) 6 (clean water and sanitation for all) and the generation of clean energy SDG 7 (affordable and clean energy) through nuclear power.¹¹⁰ With broader use of nuclear energy, IAEA works with Member States through events like the High-level Political Forum to ensure that safety standards are also imbibed in the actualization of the SDGs.¹¹¹

The global implementation of IAEA safety standards requires the engagement of young adults as youth can be actors for change when properly empowered.¹¹² IAEA provides opportunities to interact with youth from across the world through the IAEA School on Nuclear and Radiological Leadership for Safety.¹¹³ The school's participants include nuclear power plant operators, medical professionals in nuclear technology, and safety assessors from different continents.¹¹⁴ The school was created by IAEA to support the implementation of IAEA safety guidelines that relate to the systemic management of resources to prevent accidents and the inclusion of health and environmental factors in nuclear safety standards.¹¹⁵ In 2023, IAEA hosted a two-week course that trained youth on developing leadership skills for nuclear safety that they can apply in their home states, acknowledged the importance of their participation in implementation and policy making, and provided the participants with case studies to address real-life scenarios.¹¹⁶ With the inclusion of youth in leadership, policy making, and implementation of nuclear safety standards, IAEA aims to create a new generation of stakeholders that are equipped and capable of maintaining global nuclear safety standards, while ensuring continuous implementation.¹¹⁷

Emergency Response and Prevention of Nuclear and Radiological Incidents

IAEA supports EPR through its safety standards and technical support to Member States.¹¹⁸ Technical support includes assistance with the installation of Integrated Radiation Monitoring and Information Systems (IRMIS).¹¹⁹ IRMIS stations compile data for real-time radiation level monitoring to foster

¹⁰⁵ Ibid.

¹⁰⁶ Ibid.

¹⁰⁷ International Atomic Energy Agency. *Classification of Radioactive Waste*. 2009. pp. 3-4.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

¹¹⁰ International Atomic Energy Agency, International Atomic Energy Agency Department of Technical Cooperation. *IAEA Showcases Sustainable Development Goals Support at United Nations High-level Political Forum*. 2023.

¹¹¹ Ibid.

¹¹² International Atomic Energy Agency. *Building the New Generation of Leaders for Nuclear Safety*. 2023.

¹¹³ Ibid.

¹¹⁴ Ibid.

¹¹⁵ International Atomic Energy Agency. *Leadership and Management Safety*. 2016.

¹¹⁶ International Atomic Energy Agency. *Building the New Generation of Leaders for Nuclear Safety*. 2023.

¹¹⁷ Ibid.

¹¹⁸ International Atomic Energy Agency. *Emergency preparedness and response*. 2023.

¹¹⁹ Ibid.



information sharing and assess potential threats of radiation emergencies.¹²⁰ Compilation of this data is done in Member States registered in the IAEA's IRMIS network, but data can also be compiled immediately in case of an emergency.¹²¹ IRMIS currently has 48 members.¹²²

As more Member States join IRMIS, each Member States will be better assisted in the event of a nuclear accident or dangerous radiation levels as targeted response will minimize risks to humans and the environment.¹²³ There are currently 6,000 operational monitoring stations across the world in 48 countries.¹²⁴ These monitoring stations facilitate IAEA's work to enhance global nuclear safety by providing data to appropriate response authorities when there is a nuclear or radiological incident or emergency.¹²⁵ In 2023, IAEA assisted Moldova with the installation of eight of these systems, which will make it possible to obtain real-time information on radiation levels across the country and share the information with IAEA's IRMIS network.¹²⁶ IRMIS does not serve as an early warning system, but it provides Member States with the needed information to take appropriate actions to protect the public in the event of a nuclear or radiological incident through guidelines that outline specific steps relating to evacuation, containment, and domestic safety measures.¹²⁷

IAEA's IRMIS network was established in 2016 to support the *Convention on Early Notification of a Nuclear Accident* (1986) to aid in monitoring radiation levels during a nuclear emergency.¹²⁸ It was also created in response to a need for global monitoring systems, better preparedness, and information sharing, and to assist with EPR in events of nuclear or radiological incidents.¹²⁹ Another IAEA tool for EPR is the EPR Information Management System (EPRIMS), which serves as a web-based platform for Member States to share information and technology on their respective national EPR systems.¹³⁰ An important feature of EPRIMS is that it gives Member States the ability to conduct self-assessments of their EPR status and gives them the option to voluntarily share this information with other Member States.¹³¹

In Southeast Asia, IAEA entered an agreement with the Association of Southeast Asian Nations to promote knowledge sharing, research for development, and the development of nuclear technologies through investment in science and technology with the intent of promoting peaceful uses of nuclear technology.¹³² In 2023, IAEA in partnership with the Norwegian Directorate for Civil Protection conducted a maritime nuclear emergency preparedness field exercise as a multi-level test of emergency response to a maritime incident involving a nuclear-powered vessel.¹³³ This test was conducted because many shipping vessels that travel through the Arctic region have nuclear-powered systems and carry radioactive material.¹³⁴ IAEA recognizes the risk of a maritime nuclear incident, especially in the Arctic where the climate conditions can pose a challenge to emergency response.¹³⁵ At the end of the test, participants encouraged broader adoption of the good practices enshrined in Norway's nuclear energy

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² Ibid.

¹²³ Ibid.

¹²⁴ Ibid.

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ International Atomic Energy Agency. *Five Countries Join IAEA's Radiation Monitoring System*. 2023.

¹²⁹ International Atomic Energy Agency. *Emergency preparedness and response*. 2023.

¹³⁰ International Atomic Energy Agency. *EPR information exchange*. 2023.

¹³¹ Ibid.

¹³² International Atomic Energy Agency. *IAEA and ASEAN Strengthen Cooperation in Nuclear Science, Technology and Applications, and Nuclear Safety, Security and Safeguards*. 2019.

¹³³ International Atomic Energy Agency. *A Test of International Cooperation in Emergency Preparedness at Sea*. 2023.

¹³⁴ Ibid.

¹³⁵ Ibid.



policy, especially its openness to regional and global cooperation.¹³⁶ It highlighted areas for improvement such as adopting a national policy for nuclear safety, a national policy for radioactive waste management, and an integrated management system for these policies.¹³⁷ Through regional partnerships in areas like these, IAEA ensures international cooperation to prevent maritime nuclear incidents while maintaining preparedness for emergency response.¹³⁸

Conclusion

Nuclear emergencies and incidents have the potential for wide-ranging harm to persons and the environment, as they can spread across multiple countries if not responded to effectively and immediately.¹³⁹ To address gaps in emerging areas of nuclear safety and risks, IAEA and its Member States are continuously developing and updating safety and security standards for nuclear preparedness and response.¹⁴⁰ Working with Member States in emerging nuclear risk areas like the Arctic, IAEA can work to prevent nuclear accidents from occurring outside of the controlled environment of nuclear facilities.¹⁴¹ However, complex situations, such as the conflict in Ukraine and difficulties in supplying the ZNPP, show that nuclear EPR is a constantly evolving area.¹⁴² By partnering with Member States on projects like IRMIS and the School on Nuclear and Radiological Leadership for Safety, IAEA can help Member States be proactive in preparing and being ready to react should a nuclear accident or emergency occur.¹⁴³

Further Research

As delegates conduct further research and develop suggestions on how to address this topic, they should consider: How can IAEA and the international community develop warning systems to further strengthen preparedness for nuclear or radiological incidents? In what ways can IES be improved in order to facilitate information sharing among Member States on the status of their nuclear and radiological infrastructure? What measures can be taken to further prevent maritime nuclear incidents, especially in climate-challenging regions? How can IAEA expand and continue stakeholder training through platforms like the IAEA School on Nuclear and Radiological Leadership for Safety?

¹³⁶ International Atomic Energy Agency. *IAEA Says Norway is Committed to Strengthening Safety, Sees Areas for Further Enhancement*. 2023.

¹³⁷ Ibid.

¹³⁸ International Atomic Energy Agency. *A Test of International Cooperation in Emergency Preparedness at Sea*. 2023.

¹³⁹ International Atomic Energy Agency. *IAEA Background Document On Chernobyl*. N.d. p. 2.

¹⁴⁰ International Atomic Energy Agency. *Emergency preparedness and response*. 2023.

¹⁴¹ International Atomic Energy Agency. *IAEA Says Norway is Committed to Strengthening Safety, Sees Areas for Further Enhancement*. 2023.

¹⁴² International Atomic Energy Agency. *Nuclear Safety, Security and Safeguards in Ukraine (GOV/2023/30)*. 2023. p. 14.

¹⁴³ International Atomic Energy Agency. *Emergency preparedness and response*. 2023; International Atomic Energy Agency. *Building the New Generation of Leaders for Nuclear Safety*. 2023.



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2. Improving the Safe and Secure Transport of Radioactive Material

Introduction

Radioactive materials are substances or their combinations that spontaneously emit ionizing radiations.¹⁴⁴ International nuclear transport entails everything associated with, or involved in, moving radioactive material.¹⁴⁵ This includes the design and production of packaging, as well as the preparation, carriage, in-transit storage, and unloading of radioactive material between two or more countries.¹⁴⁶ Radioactive material can be transported by road, sea, rail, and air.¹⁴⁷ The safety and security of radioactive material are two distinct but interlinked concepts.¹⁴⁸ The safety of radioactive material in transport refers to the prevention of radioactive leakages and accidents as well as the protection of workers, the public, and the environment.¹⁴⁹ By contrast, the secure transport of nuclear materials describes the prevention and detection of criminal or unauthorized acts involving radioactive material in transport.¹⁵⁰

According to the International Atomic Energy Agency (IAEA), radioactive materials are transported 20 million times globally each year.¹⁵¹ In order to produce energy, radioactive material has to be transported at least 12 times.¹⁵² Nuclear power accounts for about 10% of electricity generation globally.¹⁵³ More than 95% of transported radioactive material is used for medical or industrial purposes.¹⁵⁴ For example, nuclear technology is used to kill food-borne diseases and increase the shelf-life of food, reducing food loss and waste, ensuring food safety, and helping increase overall food security.¹⁵⁵ Products such as smoke detectors and watches also rely on nuclear technology to function.¹⁵⁶ These examples highlight that radioactive material, and thus by extension their safe and secure transport, play an important role in people's daily lives.¹⁵⁷

Between 1993 and 2021, 310 of 630 cases of radioactive material were stolen during transport, and less than half of the stolen cases were retrieved.¹⁵⁸ A widely-covered case happened in Australia in 2023 when a radioactive capsule the size of a pea was recovered two weeks after it was lost during transport.¹⁵⁹ International cooperation in transporting radioactive material is important because radiation risks may transcend across borders, yet regulating the safety and security remains the primary responsibility of Member States.¹⁶⁰ To prevent accidents during transport and mitigate their aftermath,

¹⁴⁴ United Nations Committee of Experts of the transport of dangerous goods. *Transport of dangerous goods: recommendations concerning the classification, listing and labeling of dangerous goods and shipping papers for such goods (E/CN.2/170)*. 1956. p. 14.

¹⁴⁵ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 3.

¹⁴⁶ *Ibid.*

¹⁴⁷ *Ibid.* p. 7.

¹⁴⁸ International Atomic Energy Agency. *Managing the Interface between Safety and Security for Normal Commercial Shipments of Radioactive Material*. 2021. p. 1.

¹⁴⁹ International Atomic Energy Agency. *IAEA Safety Glossary: Terminology Used in Nuclear Safety and Radiation Protection*. 2016. p. 132.

¹⁵⁰ *Ibid.*

¹⁵¹ International Atomic Energy Agency. *Transport Security*. 2023.

¹⁵² World Nuclear Association. *Transport of Radioactive Material*. 2022.

¹⁵³ International Energy Agency. *What is the role of nuclear power in clean energy transitions?* N.d.

¹⁵⁴ World Nuclear Association. *Transport of Radioactive Material*. 2022.

¹⁵⁵ World Nuclear Association. *Radioisotopes in Food & Agriculture*. 2021.

¹⁵⁶ *Ibid.*

¹⁵⁷ World Nuclear Association. *The Many Uses of Nuclear Technology*. 2021.

¹⁵⁸ International Atomic Energy Agency. *The Role of Safety and Security in Transport of Radioactive Material Discussed at Vienna Conference*. 2021.

¹⁵⁹ Hoskins et al. BBC. *Missing radioactive capsule found in Australia*. 2023.

¹⁶⁰ International Atomic Energy Agency. *Nuclear Security (GC(66)/RES/7)*. 2022. p. 46.



there are international regulations on the transport of radioactive material for Member States to follow.¹⁶¹ This helps reduce any harm to people or the environment while enabling the safe and secure transport of radioactive materials.¹⁶² IAEA plays a foundational role in drafting regulations, and many Member States translate IAEA's standards and regulations into their national regulation.¹⁶³

International and Regional Framework

Safe and secure transport of radioactive material contributes to the objectives of the *Charter of the United Nations* (1945).¹⁶⁴ The Charter establishes that the United Nations system maintains international peace and security, and harmonizes national actions to overcome global issues.¹⁶⁵ As such, setting standards on transporting radioactive material prevents incidents with transnational impact.¹⁶⁶ The *Statute of the IAEA* was adopted in 1956 and authorizes IAEA to create safety standards to minimize danger of radioactive materials to life and property.¹⁶⁷ The Statute also states that IAEA shall ensure that Member States adhere to these safety standards.¹⁶⁸

The *United Nations Recommendations on the Transport of Dangerous Goods* (1956), developed by the United Nations Economic and Social Council (ECOSOC) Committee of Experts on the transport of dangerous goods, provide a basis for harmonizing national actions on the transportation of hazardous goods and materials and are updated every two years.¹⁶⁹ The Committee of Experts recognized the need for coordination with IAEA in the transport of radioactive material, which resulted in IAEA drafting the *Regulations for the Safe Transport of Radioactive Materials* (1961).¹⁷⁰ These set non-binding regulatory standards for transporting radioactive materials and have been extensively revised eight times.¹⁷¹

To further ensure the safety of radioactive material, IAEA Member States adopted the *Convention on the Physical Protection of Nuclear Material* (CPPNM) (1979), to which 164 Member States are States parties.¹⁷² The CPPNM establishes key definitions for international nuclear transport and outlines measures and responsibilities of Member States in ensuring the safe and secure international transport of radioactive material.¹⁷³ Moreover, it recommends Member States to criminalize acts threatening the security of radioactive material and highlights actions for international cooperation and exchange of information on transporting radioactive material.¹⁷⁴ Member States extended the scope of the CPPNM

¹⁶¹ International Atomic Energy Agency. *The Convention on the Physical Protection of Nuclear Material (INFCIRC/274/Rev.1)*. 1980. p. 5.

¹⁶² United Nations Committee of Experts of the transport of dangerous goods. *Transport of dangerous goods: recommendations concerning the classification, listing and labeling of dangerous goods and shipping papers for such goods (E/CN.2/170)*. 1956.

¹⁶³ Council of the European Union. *Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel*. 2006. p. 8.

¹⁶⁴ United Nations Conference on International Organization. *Charter of the United Nations*. 1945.

¹⁶⁵ Ibid.

¹⁶⁶ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 3.

¹⁶⁷ International Atomic Energy Agency. *Legally Binding and Non-Binding International Instruments and Regulations Concerning the Safe Transport of Radioactive Materials and their Implementation*. 2017. p. 13.

¹⁶⁸ Ibid.

¹⁶⁹ United States Department of Transportation. *United Nations Sub-Committee of Experts on the Transport of Dangerous Goods*. 2023.

¹⁷⁰ International Atomic Energy Agency. *Legally Binding and Non-Binding International Instruments and Regulations Concerning the Safe Transport of Radioactive Materials and their Implementation*. 2017. p. 13.

¹⁷¹ Ibid.

¹⁷² International Atomic Energy Agency. *The Convention on the Physical Protection of Nuclear Material (INFCIRC/274/Rev.1)*. 1980.

¹⁷³ Ibid.

¹⁷⁴ Ibid.



through the *Amendment to the Convention on the Physical Protection of Nuclear Material* (2005) to cover the domestic use, storage and transport of radioactive material, criminalize the smuggling of radioactive material, and expand cooperation and information sharing in such cases.¹⁷⁵ Additionally, fast emergency responses are crucial in the event of accidents during transport.¹⁷⁶ The *Convention on Early Notification of a Nuclear Accident* and the *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*, both adopted in 1986, request IAEA to collect and disseminate information concerning methodologies, techniques and available results of research on responding to nuclear accidents or radiological emergencies.¹⁷⁷

The *United Nations Convention on the Law of the Sea* (UNCLOS), adopted in 1982 at the United Nations Conference on the Law of the Sea, addresses Member States' responsibilities and privileges in territorial and international waters.¹⁷⁸ The UNCLOS establishes that vessels that are nuclear-powered or carry radioactive material must undertake special precautionary measures established by the CPPNM (1979), among others, while passing through the territorial waters of Member States.¹⁷⁹ In addition, the UNCLOS states that Member States shall ensure the protection of the marine environment, which includes preventing radioactive accidents while transporting radioactive material.¹⁸⁰ Furthermore, the *International Convention for the Safety of Life at Sea* (1974) and the *International Maritime Dangerous Goods Code* (1991), both endorsed by the International Maritime Organization (IMO) Assembly, regulate how to package radioactive material to ensure the safety of workers and enhance the environmentally safe transport of such material.¹⁸¹

On a regional level, the *European Agreement Concerning the International Carriage of Dangerous Goods by Road* (ADR) (1957), adopted by Member States of the United Nations Economic Commission for Europe (UNECE), establishes safety standards for the transport of dangerous material by road.¹⁸² The ADR is regularly revised and bases its provision for the transport of radioactive material on IAEA's 2018 edition of the *Regulation for the Safe Transport of Radioactive Material*, highlighting the overall impact of IAEA guidelines and recommendations for regulating such transport.¹⁸³ Beyond Europe, the *African Nuclear-Weapon-Free Zone Treaty* (Pelindaba Treaty), adopted in 1996, does not explicitly address the transport of radioactive material but prohibits the non-peaceful use of radioactivity.¹⁸⁴ This entails a ban on in-land transport of nuclear explosive devices.¹⁸⁵ The *Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean* (Treaty of Tlatelolco), adopted in 1967, does not address the transport of radioactive material.¹⁸⁶

¹⁷⁵ International Atomic Energy Agency. *Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment*. 2023.

¹⁷⁶ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material (SSG-65)*. 2022. p. 22.

¹⁷⁷ International Atomic Energy Agency. *Convention on Early Notification of a Nuclear Accident (INFCIRC/335)*. 1986.

¹⁷⁸ United Nations Conference on the Law of the Sea. *United Nations Convention on the Law of the Sea*. 1982.

¹⁷⁹ Ibid.

¹⁸⁰ Ibid.

¹⁸¹ International Maritime Organization. *International Convention for the Safety of Life at Sea (SOLAS), 1974*. 1974.

¹⁸² United Nations Economic Commission for Europe. *Agreement Concerning the International Carriage of Dangerous Goods by Road (ECE/TRANS/326 (Vol.I))*. 2023. p. 63.

¹⁸³ Ibid.

¹⁸⁴ United Nations, General Assembly. *Final Text of a Treaty on an African Nuclear-Weapon-Free Zone: (A/50/426)*. 1995.

¹⁸⁵ International Atomic Energy Agency. *African Nuclear Weapon-Free-Zone Treaty (Pelindaba Treaty)*. 2023.

¹⁸⁶ United Nations, General Assembly. *Letter dated 20 February 1967 from the permanent representative of Mexico to the United Nations addressed to the Secretary-General (A/6663)*. 1967.



Ensuring the safe and secure transport of radioactive material is linked to the *2030 Agenda for Sustainable Development* (2030 Agenda) and the Sustainable Development Goals (SDGs), adopted in 2015.¹⁸⁷ Only when the transport of radioactive material is safe and secure can radioactive technology facilitate sustainable development.¹⁸⁸ For example, leakages as a result of a lack of safety and security in the transport of radioactive material can affect the health of exposed people, which adversely impacts SDG 3 (good health and well-being), as well as maritime and territorial ecosystems, which affect SDG 14 (life below water) and SDG 15 (life on land).¹⁸⁹

Role of the International System

International cooperation in transporting radioactive material allows for knowledge exchange, as well as improving capabilities to prevent accidents and mitigate consequences arising from such accidents, amongst others.¹⁹⁰ IAEA serves as a knowledge hub, a platform to exchange ideas, and an organization that sets international standards for regulating the transport of radioactive material.¹⁹¹ It aims to promote atomic energy globally for peace, health, and prosperity.¹⁹² Furthermore, IAEA works to ensure the safe use of radioactive material to advance sustainable development.¹⁹³ As such, IAEA develops policy guidelines, such as the updated *Regulations for the Safe Transport of Radioactive Material* (2018), as well as detailed recommendations, like the *Safety Standard Series* (SSG) whose 251 publications discuss various aspects of radioactive safety.¹⁹⁴ Furthermore, IAEA's General Conference regularly discusses and adopts relevant resolutions on transporting radioactive material, including safety and security.¹⁹⁵

Moreover, IAEA coordinates with other United Nations organizations on policy recommendations and actions.¹⁹⁶ The World Health Organization (WHO) establishes recommendations to protect workers from radioactive exposure during such transport.¹⁹⁷ IMO provides guidance to improve national regulations to ensure safety and security during the transport of radioactive material via waterways.¹⁹⁸ The International Civil Aviation Organization (ICAO) also provides guidance on the safe transport of radioactive material by air, such as the *Guidance Material for Transporting Persons Subjected to Radioactive Material Intake* (2011), which were developed in coordination with IAEA.¹⁹⁹

Furthermore, the Organization for Economic Co-operation and Development (OECD) engages in international nuclear partnerships and created the Nuclear Energy Agency (NEA) in 1958, which facilitates collaboration in research for enhancing radioactive safety and technology for peaceful purposes.²⁰⁰ As such, NEA has established a working group aiming at promoting the transport of radioactive material by information sharing on national legislation.²⁰¹ Another advocate for boosting the transport of radioactive material is the World Nuclear Association (WNA).²⁰² WNA comprises the majority

¹⁸⁷ International Atomic Energy Agency. *Sustainable Development Goals (SDGs)*. 2023.

¹⁸⁸ Ibid.

¹⁸⁹ United Nations, Department of Economic and Social Affairs. *The 17 Goals*. N.d.

¹⁹⁰ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018.

¹⁹¹ Ibid. p. ix.

¹⁹² International Atomic Energy Agency. *The Statute of the IAEA*. 2023.

¹⁹³ International Atomic Energy Agency. *Legally Binding and Non-Binding International Instruments and Regulations Concerning the Safe Transport of Radioactive Materials and their Implementation*. 2017. p. 13.

¹⁹⁴ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018.

¹⁹⁵ International Atomic Energy Agency. *Nuclear and radiation safety (GC(66)/RES/6)*. 2022.

¹⁹⁶ International Atomic Energy Agency. *The Statute of the IAEA*. 2023.

¹⁹⁷ International Atomic Energy Agency. *International Basic Safety Standards for Protection against Ionizing Radiation and or the Safety of Radiation Sources*. 1996. p. 13.

¹⁹⁸ Ibid.

¹⁹⁹ International Civil Aviation Organization. *Guidance Material for Transporting Persons Subjected to Radioactive Material Intake*. 2011.

²⁰⁰ Nuclear Energy Agency. *About us*. 2020.

²⁰¹ Nuclear Energy Agency. *Working Party on Nuclear Liability and Transport (WPNLT)*. 2020.

²⁰² World Nuclear Association. *World Nuclear Association Members*. 2023.



of private sector companies involved in the radioactive value chain and global nuclear industry.²⁰³ The objective of this industry association is to promote a wider understanding of nuclear energy and develop common industry positions, including advocating for the harmonization of regulations on transporting radioactive material.²⁰⁴

On a regional level, the European Atomic Energy Community (EURATOM) is an international organization established in 1957 by six European Member States to facilitate the development of nuclear energy.²⁰⁵ The safe transport of radioactive material contributes to the achievement of this objective.²⁰⁶ While predating the European Union (EU), its governance system is now part of the EU.²⁰⁷ Consequently, EURATOM has adopted the legally binding *Council Directive 2006/117/EURATOM on the supervision and control of shipments of radioactive waste and spent fuel* (2006), which states that the export of radioactive material is prohibited if IAEA's safety standards are not met.²⁰⁸ Similarly, the Association of Southeast Asian Nations (ASEAN) established the ASEAN Network of Regulatory Bodies on Atomic Energy (ASEANTOM) in 2013 to facilitate regional cooperation in nuclear safety, security, and safeguards.²⁰⁹ ASEANTOM assists Member States in implementing and adhering to their commitments to IAEA.²¹⁰

Improving safe and secure transport along supply chains for radioactive material

The safe and secure transportation of radioactive material along supply chains preserves public safety by preventing the unintentional release of radioactive material and information, and neutralizing potential security concerns.²¹¹ Stringent rules, packaging and labeling standards, extensive training programs, and effective communication networks help achieve this goal.²¹² IAEA promotes the development of proactive supply chain management systems.²¹³ IAEA General Conference resolution 66/7 on "Nuclear and Radiation Safety" (2022) calls on Member States to establish national frameworks governing the safe transport of radioactive material in line with IAEA's recommendations.²¹⁴ Additionally, it calls for the facilitation of the transport of radioactive material through mutual understanding and trust-building between Member States.²¹⁵

Given the delicacy of radioactive material, security measures are put in place to prevent theft, illegal access, and illicit trafficking.²¹⁶ The first step of the supply chain for radioactive materials is the mining of uranium or plutonium, or extraction from other industrial processes such as nuclear power generation.²¹⁷ During manufacturing, strict management control methods are undertaken, and the material is carefully packaged to prevent leakage or unintentional exposure during transport, as indicated in IAEA's *Regulations for the Safe Transport of Radioactive Material* (2018).²¹⁸ Radioactive material is then delivered from manufacturing factories to end users, such as nuclear power plants, research institutions,

²⁰³ Ibid.

²⁰⁴ World Nuclear Association. *Our Mission*. 2023.

²⁰⁵ European Parliament. *Euratom Treaty*. N.d.

²⁰⁶ Ibid.

²⁰⁷ Ibid.

²⁰⁸ Council of the European Union. *Council Directive 2006/117/EURATOM of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel*. 2006. 2006. p. 34.

²⁰⁹ Association of Southeast Asian Nations. *Nuclear Safety, Security, and Safeguards*. 2020.

²¹⁰ Ibid.

²¹¹ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 2.

²¹² Ibid.

²¹³ International Atomic Energy Agency. *Management of the nuclear supply chain*. 2023.

²¹⁴ International Atomic Energy Agency. *Nuclear Security (GC(66)/RES/7)*. 2022. p. 46.

²¹⁵ Ibid.

²¹⁶ International Atomic Energy Agency. *Combating Illicit Trafficking in Nuclear and other Radioactive Material: Reference Manual*. 2007.

²¹⁷ Canadian Nuclear Safety Commission. *Naturally occurring radioactive material*. 2023.

²¹⁸ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 2.



and medical facilities.²¹⁹ Depending on the type and quantity of goods, transportation methods may include road, rail, air, or ocean transit.²²⁰ During transit, issues remain, including the lack of designated storage areas for radioactive material in ports that may lead to preventable delays or denials.²²¹

As part of its aim to prevent nuclear terrorism, IAEA published the *Combating Illicit Trafficking in Nuclear and other Radioactive Material* (2007) technical guidance that promotes international initiatives for improving the security of radioactive material.²²² Furthermore, international safeguards are in place to prevent nuclear material from being diverted for unlawful uses.²²³ In its resolution 66/7 on “Nuclear Security” (2022), IAEA’s General Conference stresses the need to take effective measures against insider threats during transport.²²⁴ When facilities containing radioactive material are decommissioned, material and equipment must be safely dismantled, decontaminated, and disposed of.²²⁵ It may also involve recycling to extend the use of radioactive material and limit its waste, resulting in an additional demand for transport.²²⁶ Guidelines from both WNA and IAEA are utilized for systematic disposal.²²⁷ To handle radioactive waste, proper waste management methods are followed, including the identification, segregation, and storage of distinct types of waste based on their amount of radioactivity.²²⁸ The question lies in whether the safety of packaging, storage, and transport is the same across all different steps of the supply chain.²²⁹

Collaboration and information sharing between governments, industry stakeholders, Member States, and regulatory organizations ensure the safe, secure, and responsible handling of radioactive material.²³⁰ The lack of harmonization of national regulation between Member States creates problems for transporting radioactive materials.²³¹ In contrast, continuous monitoring, cohesion to rules, and the implementation of guarded practices all contribute to managing risks and protecting the supply chain’s integrity.²³² The safe and secure transport of radioactive material along supply chains can further be verified by adhering to laws, establishing sturdy packaging and labeling, offering comprehensive training, and integrating security measures and emergency response protocols.²³³ These safeguards uphold public safety and environmental integrity.²³⁴

Preparing for, and responding to, emergencies in transport of radioactive material

Adherence to regulation decreases the likelihood of nuclear incidents, but regardless of meticulous care and precision in transport, they may still happen.²³⁵ For example, a radioactive source was reported

²¹⁹ International Atomic Energy Agency. *Management of the nuclear supply chain*. 2023.

²²⁰ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 3.

²²¹ International Irradiation Association. *Transport of Radioactive Material*. N.d.

²²² International Atomic Energy Agency. *Combating Illicit Trafficking in Nuclear and other Radioactive Material: Reference Manual*. 2007.

²²³ Ibid. p. 19.

²²⁴ International Atomic Energy Agency. *Nuclear Security (GC(66)/RES/7)*. 2022.

²²⁵ World Nuclear Association. *Storage and Disposal of Radioactive Waste*. 2023.

²²⁶ Ibid.

²²⁷ World Nuclear Association. *Radioactive Waste Management*. 2022.

²²⁸ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. v.

²²⁹ International Atomic Energy Agency. *Security in the Transport of Radioactive Material*. 2008.

²³⁰ United States Department of Energy. *Nuclear Energy: Supply Chain Deep Dive Assessment*. 2022.

²³¹ World Nuclear Association. *Transport of Radioactive Material*. 2022.

²³² United States Department of Energy. *Nuclear Energy: Supply Chain Deep Dive Assessment*. 2022.

²³³ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 18.

²³⁴ Ibid. p. v.

²³⁵ Parada et al. Bulletin of the Atomic Scientists. *Radioactive material is still missing in Malaysia: Cause for concern?* 2018.



missing in Malaysia in 2018, while being transported, and it has not been recovered since.²³⁶ According to IAEA, preparing for and responding to emergencies during the transport of radioactive material includes training sessions for personnel closely working with radioactive material, risk assessments to identify problems, and emergency strategies to enable a fast response following an emergency.²³⁷

IAEA's General Conference has adopted several resolutions on this topic and provides Member States with recommendations on preparing and responding to nuclear emergencies, including in transit.²³⁸ In its resolution 59/9 on "Measures to strengthen international cooperation in nuclear, radiation, transport and waste safety," adopted in 2015, IAEA's General Conference requests Member States and other relevant organizations to highlight the special challenges and requirements for effective international cooperation in response to emergencies involving radioactive material transit, among others.²³⁹ IAEA's Emergency Preparedness and Response Standards Committee (EPRaSC) reviews existing preparedness and response standards and proposes new ones if the current framework is identified to be insufficient to prevent nuclear accidents, including during the transit of radioactive material.²⁴⁰ The IAEA Safety Standards Series No. GSR Part 7 entitled *Preparedness and Response for a Nuclear or Radiological Emergency* (2015) establishes requirements for sufficient preparedness for and response to a nuclear or radiological emergency, regardless of its origins.²⁴¹ Similarly, the *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material - Specific Safety Guide (SSG-65)* (2022), a collaborative effort by IAEA, ICAO, and IMO, provides more guidance and recommendations on faculty training, preparations, and emergency arrangements.²⁴²

Following the Chernobyl accident of 1986, IAEA and other relevant international organizations established the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE).²⁴³ Constituents of IACRNE co-sponsor the *Joint Radiation Emergency Management Plan of the International Organizations* (Joint Plan) (2017).²⁴⁴ The Joint Plan outlines procedures when responding to emergencies and makes preparedness arrangements for accidents during transport.²⁴⁵ The safety of working personnel and the general public, evacuation, and medical aid are all points of concern in the plan.²⁴⁶ Following any transport emergency, a thorough evaluation is to be carried out to evaluate the response and identify areas for improvement.²⁴⁷ The incident's potential aftermath can be used to improve future disaster planning and response strategies, as well as improve safety and security measures in the transport of radioactive material as a whole.²⁴⁸ It may also support the evaluation of the effectiveness of implemented measures following an emergency.²⁴⁹

²³⁶ Ibid.

²³⁷ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material (SSG-65)*. 2022. p. 30.

²³⁸ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. xi.

²³⁹ International Atomic Energy Agency. *Resolutions and Other Decisions of the General Conference (GC(59)/RES/DEC)*. 2015. pp. 13-29.

²⁴⁰ International Atomic Energy Agency. *Report of the Fifteenth Meeting of the Emergency Preparedness and Response Standards Committee (EPRaSC)*. 2023.

²⁴¹ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency*. 2015. pp. 7-58.

²⁴² International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material (SSG-65)*. 2022.

²⁴³ World Nuclear Association. *Chernobyl Accident 1986*. 2022.

²⁴⁴ International Atomic Energy Agency. *Coordination of inter-agency response*. 2023.

²⁴⁵ International Atomic Energy Agency. *Joint Radiation Emergency Management Plan of the International Organizations*. 2017. pp. 12-17, 49-52.

²⁴⁶ Ibid.

²⁴⁷ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material*. 2022. p. 47.

²⁴⁸ Ibid. p. 82.

²⁴⁹ Ibid.



IAEA prioritizes the assessment and analysis of risks connected to transporting radioactive material and regularly establishes guidelines for safety and security risks and hazards.²⁵⁰ Similarly, the *Regulations for the Safe Transport of Radioactive Material* (2018) assert that anyone involved in the transportation of radioactive material shall have access to specialized training in emergency response techniques, including recognizing and responding to potential events such as the theft of radioactive material.²⁵¹ This training includes handling hazardous circumstances, communication protocols, and cooperation with necessary authorities and emergency services.²⁵² However, programs, training, and protocols are created without taking into consideration their practicality in national legislation, lacking the sufficient infrastructure to implement them.²⁵³ Ensuring that adequate, inclusive, and all-encompassing safety and security measures are put in place will not only safeguard the personnel, goods, and the environment but will reduce the chance of accidents happening during transportation altogether.²⁵⁴

Conclusion

Besides its use to generate nuclear energy, radioactive material is used in many sectors, including medicine, food and agriculture, and industrial production.²⁵⁵ Thus, improving the safe and secure transport of radioactive material benefits not only people, but also the environment.²⁵⁶ Therefore, the transport of radioactive material has been a matter of concern for IAEA in the past decades.²⁵⁷ The safe and secure transportation of radioactive material along supply chains preserves safety, prevents unintentional release of radioactive material, and neutralizes potential security concerns throughout the life cycle of the radioactive material.²⁵⁸ Correspondingly, the efforts in both preparing for, and responding to, emergencies in transport of radioactive material improve safety and security measures as a whole.²⁵⁹ IAEA continues to coordinate international efforts to strengthen global nuclear safety and develop safety and security frameworks.²⁶⁰ IAEA also continues to foster international dialogue on how to make the transport of radioactive material safe and secure for everyone involved.²⁶¹

Further Research

As delegates conduct further research to address this topic, they should consider: How is their own national government addressing safe and secure transport of radioactive material? Is their country State party part of any conventions that promote international cooperation and management of the safe and secure transport of radioactive material? Has their Member State addressed the issue of illicit trafficking and malicious and unauthorized access to radioactive material? How can the safety and security of radioactive material in transport be improved in fragile countries?

²⁵⁰ International Atomic Energy Agency. *Input data for quantifying risks associated with the transport of radioactive material*. 2003.

²⁵¹ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 18.

²⁵² Ibid.

²⁵³ International Atomic Energy Agency. *Inadequate Control of World's Radioactive Sources*. 2002.

²⁵⁴ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material (SSG-65)*. 2022. p. 5.

²⁵⁵ International Energy Agency. *What is the role of nuclear power in clean energy transitions?* N.d.

²⁵⁶ International Atomic Energy Agency. *Managing the Interface between Safety and Security for Normal Commercial Shipments of Radioactive Material*. 2021.

²⁵⁷ International Atomic Energy Agency. *Intertran - A System for Assessing the Impact from Transporting Radioactive Material*. 1983.

²⁵⁸ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. 2.

²⁵⁹ International Atomic Energy Agency. *Preparedness and Response for a Nuclear or Radiological Emergency Involving the Transport of Radioactive Material*. 2022 (SSG-65). p. 5.

²⁶⁰ International Atomic Energy Agency. *Regulations for the Safe Transport of Radioactive Material*. 2018. p. v.

²⁶¹ Ibid. p. 2.



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