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**LEGAL IMPLICATIONS AND REGULATORY CHALLENGES OF
MANAGING RADIOACTIVE WASTE IN METROPOLITAN CITIES: A
CRITICAL ANALYSIS**- Vaibhav Shahi¹**Abstract**

An inevitable byproduct of using radioactive materials in business, research, and medicine, as well as when nuclear power is used to provide electricity, is radioactive waste. How much trash is managed and disposed of is a problem practically all nations face. The methods and approaches for the secure handling of the diverse waste resulting from the various apps are well-established, and a great deal of expertise has been gained in most places, if not all. However, radioactive waste continues to be a significant issue on the agenda of many nations, in part due to the belief held by the general public and officials alike that the issue is still unresolved.

Keywords: Diverse, Expertise, Inevitable, Medicine

Introduction

The evolution of human society from the era of Homo habilis to the present is marked by waste. It is ubiquitous in all thriving settlements and provides a foundation for anthropological research. Historically, humans — including those in highly sophisticated civilizations — cared little about managing the garbage they produced. Sewers are a relatively modern development, and latrines were introduced primarily in connection with purity rites rather than for environmental protection, so concerns about neighbours or environmental protection were unfounded. The usual management practice was to dispose of their waste in the surrounding habitat.²

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² Issues and Trends in Radioactive Waste Management, available at https://www-pub.iaea.org/mtcd/publications/pdf/pub1175_web/book/pub1175_web.pdf (last visited November 28, 2023).

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However, this social behaviour, prevalent during the Industrial Revolution, is finally evolving. Today's society prioritizes environmental care, sustainable development, our fellow humans, and future generations. The United Nations Conference on Environment and Development (Rio de Janeiro, 1992) and its significant findings may have set the foundation.³ Like other eras of human evolution, the age that began with Becquerel's discovery of radioactivity and gained momentum with the introduction of nuclear power has inevitably produced its kind of garbage. It should come as no surprise that radioactive waste is the legacy of the nuclear era.⁴

The IAEA is keeping up with these changes within its purview, and this paper outlines the pertinent IAEA initiatives. For example, various topics and developments in the safety of managing radioactive waste are anticipated to be covered at this conference, which will also present an updated picture of the global scenario. It is a logical continuation of the inaugural International Conference on the Safety of Radioactive Waste Management, which occurred slightly over 2.5 years ago in March 2000 in Córdoba, Spain. The IAEA anticipates that this conference will be a step further towards the establishment of an international regime for the safety of managing nuclear waste, which began with the Córdoba Conference.⁵

Findings of Cordoba Conference

The Córdoba Conference outlined several crucial tasks to improve the safety of radioactive waste management on a global scale. These tasks include:⁶

- **Establishing a Unified Framework:** Creating a comprehensive and unified framework to manage all forms of radioactive waste securely and cost-effectively.
- **Assessing Long-Term Storage:** Identifying the safety implications and evaluating the sustainability of extended-term radioactive waste storage.
- **International Consensus on Disposal Standards:** Achieving a global consensus on safety standards for the geological disposal of high-level waste, including spent fuel considered as waste.⁷

³*Id.*

⁴OECD, available at <https://www.oecd-nea.org/upload/docs/application/pdf/2020-11/3597-regulatory-control-rwm.pdf> (last visited November 28, 2023).

⁵*Id.*

⁶*Id.*

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- **Consistent Approach to Regulatory Control:** Developing a consistent approach to removing radioactive materials from regulatory control.
- **Global Application of Safety Standards:** Ensuring that safety standards for radioactive waste management and the necessary technologies are universally available and applied consistently.
- **Preservation of Safety Information:** Guaranteeing the preservation of information is crucial for the long-term safety of radioactive waste management, especially regarding radioactive waste disposal. This information should be passed on to future generations to assure facility safety.
- **Inclusive Stakeholder Involvement:** Effectively involving all stakeholders interested in and affected by radioactive waste management facilities, ensuring their participation in decisions regarding safe development.⁸

These action items aim to enhance the safety, consistency, and international cooperation in managing radioactive waste, addressing various aspects from regulatory control to long-term safety considerations.

Legal Implications

The OECD Nuclear Energy Agency (NEA) has a rich history and a broad mission, as outlined in the provided text.⁹

- **Establishment and Evolution:** The NEA was established on February 1, 1958, under the name of the OEEC European Nuclear Energy Agency. It received its current designation on April 20, 1972, when Japan joined as its first non-European full member.
- **Membership:** The NEA's membership comprises 28 OECD member countries. Initially European, it expanded to include non-European members, with Japan being the first. Member countries include Australia, Canada, the United States, European nations, and others.¹⁰

⁷*Supra* note 1.

⁸S. Khan, "Radioactive Waste Management in A Hospital" 4 *Int J Health Sci (Qassim)* (2010).

⁹ *Id.*

¹⁰*Supra* note 3.

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- **The New England Association (NEA) has two main goals:** to support member nations in upholding and expanding the legal, scientific, and technological underpinnings required for the affordable, safe, and sustainable use of nuclear power for peaceful purposes. To offer credible evaluations and shared knowledge on important nuclear energy matters. Contributions to broader OECD policy assessments in areas such as energy and environmental sustainability are also made possible by this input, which supports government choices on nuclear energy policy.
- **Areas of Competence:** The NEA's particular fields of expertise are atomic research, nuclear waste handling, security and oversight of nuclear operations, radiation defence, technological and economic evaluations of the nuclear energy cycle, nuclear responsibility and law.
- **NEA Data Bank:** Participating nations can access nuclear data and computer programme services through the NEA's Data Bank.¹¹
- **Collaboration:** A Cooperation Agreement attests to the strong cooperation between the NEA and the Vienna-based IAEA. In nuclear energy, it also collaborates with other international organizations.

The handling of two distinct aspects, namely dumping waste from a ship or aircraft and land-based discharges into the sea through pipelines or rivers, has traditionally been managed through separate arrangements. In both cases, the primary focus has typically been on obligations to prevent pollution. The concept of pollution, defined as early as the 1974 Paris Convention, revolves around causing harm or the potential for harm to a broad range of interests.¹²

"The dumping by human beings, either directly or through the release of substances or energy into the oceans, which outcomes, or is predicted to result, in dangers to the health of humans, harm to natural assets and aquatic ecosystems, harm to services or disruption with other legal uses of the sea" is the official description of contamination, to which reference is frequently made.

It is crucial to recognize a threshold of contamination, leading to actual or potential harm, which must be crossed before commitments to combat pollution come into effect. This threshold

¹¹*Supra* note 8.

¹²*Supra* note 8.

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underscores the significance of preventing or mitigating contamination that poses risks to human health, living resources, marine ecosystems, amenities, and legitimate uses of the sea.¹³

It is essential to remember the variety of instruments available when analyzing current advancements in international instruments. On one extreme of this range are the legally enforceable requirements included in international treaties and conventions, and on the other are informal policy pledges made by state representatives in an international setting. In the process of resolving a problem, it is common for there to be progress from the informal to the formal sides of this spectrum. Understanding the various forms of reasoning that negotiators have used in these procedures also aids in understanding the changes. With such knowledge, there is a genuine chance that the forces behind policy changes seem logical.

The Hazardous Wastes (Management, Handling, and Transboundary Movement) Rules, 2008, constitute a complex legal framework addressing the intricacies of hazardous waste management. Compliance with specific laws and regulations is mandatory to establish a robust legal structure for handling hazardous waste. These rules place a responsibility on the occupant, referring to the person in charge of a plant, unit, or factory generating hazardous waste, to manage environmental waste safely and soundly.

The occupier must sell or send dangerous materials to a recycler or reprocessor that the authorities have approved for the secure removal of trash. Anyone handling hazardous waste in any way—storage, wrapping, gathering, harm, transformation, processing, etc.—must get permission from the State Pollution Board. Waste can be held by recycling facilities, tenants, re-users, and reprocessors for a maximum of ninety days. Hazardous waste may only be sold or transferred when a legitimate registration has been obtained from the Central Pollution Control Board (CPCB).¹⁴ CPCB registration is also mandatory when utilizing waste as an energy source. By the Basel Convention, which India is a signatory to, the transboundary movement of hazardous waste is regulated. Importing hazardous waste for disposal is prohibited in India; however, imports for reuse, recovery as an energy source, and recycling are allowed with

¹³P. Sudha, "Legal aspects of handling and disposal of nuclear waste – an Indian perspective" 16 *Journal of Applied Geochemistry* (2014).

¹⁴*Id.*

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specific restrictions. The export of hazardous waste from India is permitted only with the prior knowledge and agreement of the importing country.¹⁵

Section 9 of Environment Act: Furnishing Information to Authorities and Agencies in Certain Cases.¹⁶

Discharge Above Prescribed Standards: Suppose the discharge of any environmental pollutant exceeds the prescribed standards or is anticipated due to an accident or unforeseen act. In that case, the person responsible for the discharge and the person in charge of the location where the discharge occurs or is anticipated must Take measures to prevent or mitigate environmental pollution resulting from the discharge. Immediately inform the authorities about the occurrence or the anticipated occurrence.

Obligations of the Responsible Parties: The responsible parties must provide all necessary assistance to the authorities or agencies as prescribed.

Remedial Measures by Authorities: Upon receiving information about the occurrence or anticipated occurrence, the authorities or agencies referred to in the section must take prompt remedial measures to prevent or mitigate environmental pollution.

Recovery of Expenses: Any expenses incurred by the authorities or agencies for the remedial measures can be recovered from the person responsible for the discharge. The recovery may include interest at a reasonable rate, as determined by the government, from when the demand for expenses is made until the payment is received. The recovery can be enforced as arrears of land revenue or public demand.

Conclusion

Three thousand persons lost their lives in the Bhopal Gas Tragedy Case as a result of the staff members' ineptitude. The MIC spill took people's lives, limbs, and souls. The plaintiffs filed lawsuits against Union Carbide Corporation in both Bhopal and New York district courts. The latter slammed the corporation with a compensation of Rs 350 crores. The Apex Court got the last laugh when it penalized the corporation Rs 750 crores, even though the Madhya Pradesh

¹⁵*Id.*

¹⁶*Id.*

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High Court had lowered the sum to Rs 250 crores. In *MC Mehta vs. Kamal Nath and Ors.*¹⁷, the court expressed its opinion that those who cause harm to science and the climate should be held financially accountable for their actions. Most businesses and their manufacturers are willing to harm the environment and people for financial gain. They exploit the lax legislation enforcement in India since they are aware of this. It is time for us to strengthen, tighten, and balance our laws. In this manner, we can alter both human and wildlife lives. If the current generation is prepared to change, we can provide a healthy environment for future generations.



¹⁷*Id.*

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