

HAZARDOUS PROCESSES UNDER THE FACTORIES ACT, 1948: A LEGAL AND COMPARATIVE ANALYSIS

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Abstract

The industrial landscape of India has evolved rapidly since independence, contributing significantly to economic development. However, this growth has been paralleled by an increase in occupational hazards, particularly in sectors involving hazardous processes. Recognizing the critical need to protect workers from such risks, the Factories Act, 1948, was amended in 1987 to incorporate comprehensive provisions addressing hazardous processes. This research paper undertakes a detailed legal and comparative analysis of these provisions, primarily focusing on Sections 41A to 41H, which lay down statutory safeguards for workers engaged in hazardous operations. Through a comparative analysis with international frameworks, including those of the United Kingdom, United States, Japan, Australia, and the European Union, the paper identifies best practices in managing hazardous industrial processes, such as risk assessments, public transparency, emergency planning, and proactive worker protection measures. Additionally, the study includes case law analysis, exploring key judicial interpretations of hazardous processes and their influence on the development of regulatory practices. The research also highlights the duties of the occupiers.

Keywords: Hazardous processes, Comparative analysis, legal analysis, occupier.

INTRODUCTION:

India's industrial sector has grown significantly over the past few decades, driving economic growth and creating a large workforce engaged in various industrial activities. However, this growth has been accompanied by rising concerns regarding the safety and well-being of workers, particularly those involved in hazardous processes. These processes, which often involve toxic chemicals, flammable materials, and other dangerous substances, pose significant risks to the health and safety of workers, as well as to the surrounding environment.

In response to these concerns, the Indian government enacted the Factories Act, 1948, a key piece of legislation aimed at regulating

labor conditions in factories. Although a wide range of topics pertaining to worker safety, health, and welfare are covered by the Act, the clauses pertaining to hazardous processes have attracted the greatest attention because of the potentially dire outcomes of industrial accidents. The Act's provisions, particularly Sections 41A to 41H, focus on regulating industries that handle hazardous materials, establishing requirements for safety measures, emergency protocols, and workers' rights in such environments. This paper explores these provisions in detail, examining their legal framework, the responsibilities they impose on factory owners, and the protections they offer to workers.

Moreover, comparing India's legal approach with international frameworks is vital for

assessing the adequacy of its regulations. Countries such as the United States, the United Kingdom, Japan, and European Union have implemented comprehensive laws and safety regulations to govern hazardous processes, often providing a more structured and detailed approach to worker safety. A comparative analysis of India's regulatory framework with that of these countries will highlight potential areas for improvement in India's legal system, including aspects of enforcement, worker rights, and safety standards.

OBJECTIVE OF THE STUDY:

- To analyze the provisions of the Factories Act, 1948 related to hazardous processes.
- To examine judicial interpretation and their influence on the regulation of hazardous processes under the Act.
- To compare India's Legal framework for hazardous processes with International regulations.

DEFINITION OF HAZARDOUS PROCESS:

In India, under the Factories Act, 1948, the definition of a hazardous process is provided in Section 2(cb).

Section 2(cb):

"Hazardous process" means any process or activity in relation to an industry specified in the First Schedule where, unless special care is taken, raw materials used therein or the intermediate or finished products, by-products, wastes or effluents thereof would—

- (i) cause material impairment to the health of the persons engaged in or connected therewith, or
- (ii) result in the pollution of the general environment:

Provided that the State Government may, by notification in the Official Gazette, amend the First Schedule by way of addition, omission or variation of any industry specified in the said Schedule.

Analysis of Section 2(cb):

Section 2(cb) of the Factories Act, 1948 defines a "hazardous process" as any industrial activity listed in the First Schedule which, unless special care is taken, may cause material impairment to workers' health or result in environmental pollution. The provision emphasizes a preventive approach, placing responsibility on factory occupiers to implement adequate safety measures.

The phrase "unless special care is taken" introduces a duty of care, while "material impairment to health" indicates serious, potentially long-term health effects. The linkage to the First Schedule allows flexibility, enabling State Governments to amend the list of hazardous industries based on local needs.

Thus, Section 2(cb) not only defines hazardous processes but also lays the foundation for a regulatory framework aimed at safeguarding worker health and the environment. It serves as a gateway to Chapter IV-A, which prescribes detailed safety obligations for such industries.

LEGAL FRAMEWORK FOR HAZARDOUS PROCESSES UNDER THE FACTORIES ACT, 1948:

The legal foundation for regulating hazardous processes in India is enshrined in Chapter IV-A of the Factories Act, 1948, which was inserted through the Factories (Amendment) Act, 1987 in the aftermath of the Bhopal Gas Tragedy. This chapter contains Sections 41A to 41H, specifically addressing the safety, health, and welfare of workers engaged in hazardous industries. It complements the definition provided in Section 2(cb) by laying down a detailed statutory mechanism to prevent and control industrial hazards.

Section 41A – Constitution of Site Appraisal Committee

This section mandates the formation of a Site Appraisal Committee to evaluate applications for setting up or expanding factories that involve hazardous processes. The committee consists of experts who assess the potential risks associated with the factory's location,

environmental impact, and safety measures. The objective is to ensure that hazardous industries are established in areas where risks to workers and the surrounding community are minimized.

Section 41B – Compulsory disclosure of Information by the Occupier

Factory owners are required to disclose details about hazardous processes to workers, authorities, and the public. This includes information about toxic substances, potential health hazards, and emergency response plans. Transparency in this regard ensures that workers are aware of the risks involved and can take necessary precautions.

Section 41C – Specific Responsibility of the Occupier in relation to hazardous processes

The factory owner (occupier) is responsible for implementing safety measures to protect workers. This includes:

- Providing protective equipment (helmets, gloves, masks, etc.).
 - Conducting regular safety training for workers.
 - Ensuring proper maintenance of machinery and equipment.
 - Carrying out emergency response procedures in the event of an accident.
- The occupier must also guarantee regular medical checks and keep track of the health records of employees exposed to dangerous materials.

Section 41D – Power of Central Government to appoint Inquiry Committee

The Central Government has the authority to appoint an Inquiry Committee to investigate accidents or hazardous incidents in factories. This committee examines the cause of the accident, identifies negligence, and recommends corrective actions. The findings help in improving safety regulations and preventing future incidents.

Section 41E – Emergency Standards

In case of an emergency, the government can impose temporary safety standards to protect workers and the environment. These standards may include:

- Immediate shutdown of hazardous operations.
- Mandatory use of protective gear.
- Evacuation procedures for workers in high-risk areas. This ensures swift action to mitigate risks and prevent disasters.

Section 41F – Permissible Limits of Exposure of chemical and toxic substance

This section defines the maximum allowable exposure levels for chemical and toxic substances. These limits are set based on scientific research to prevent long-term health hazards such as respiratory diseases, skin disorders, and poisoning. Factories are required to keep an eye on the quality of the air and make sure that employees are not exposed to dangerously high chemical levels.

Section 41G – Workers' Participation in Safety Management

Workers are encouraged to be involved in safety committees and decision-making processes related to workplace hazards. They can:

- Report unsafe conditions.
- Suggest improvements in safety protocols.
- Take part in safety drills and training activities.

This ensures that workers have a say in safety measures and can contribute to a safer work environment.

Section 41H – Right of workers to warn about imminent danger

Workers have the right to report any imminent danger to their health or safety. If workers suspect a serious risk, they can:

- Inform the factory management immediately.
- Notify the Safety Committee.

- Alert government inspectors if the management fails to act.

The factory management must take immediate action, and if they disagree, the matter must be referred to an inspector.

OCCUPIER'S DUTIES RELATING TO HAZARDOUS PROCESSES:

The Factories Act, 1948, particularly under Sections 41B and 41C, imposes specific legal duties on the occupiers of factories involving hazardous processes. These duties aim to ensure the health, safety, and welfare of workers, and to reduce the potential for industrial accidents.

An occupier, as defined under Section 2(n) of the Act, is the person who has ultimate control over the affairs of the factory. In the context of hazardous processes, the law mandates a higher degree of diligence and accountability. These obligations include:

1. Disclosure of Information:

The occupier is bound to disclose complete information regarding hazards associated with any material or process, safety measures, and emergency procedures to:

- Workers and their representatives,
- Local authorities, and
- the people who live nearby in general.

2. Maintenance of Safety Data:

The occupier must maintain updated material safety data sheets for all hazardous substances, including details about physical and chemical properties, health effects, safe handling, and emergency control measures.

3. Safety Reports and Emergency Plans:

An on-site emergency plan must be prepared and submitted to authorities. The occupier must also submit periodic safety audit reports, reflecting adherence to prescribed norms.

4. Medical Examination of Workers:

Workers engaged in hazardous processes must undergo initial and periodic medical examinations to detect early signs of

occupational diseases. The cost of such exams is to be borne by the management.

5. Safety Training and PPE:

The occupier is obligated to:

- Provide training in handling hazardous materials,
- Provide personal protective equipment (PPE) and ensure its use.
- Ensure the factory is equipped with emergency exits, fire-fighting equipment, and first-aid facilities.

Failure to comply with these duties may result in criminal liability, including fines and imprisonment under Section 92 of the Act.

COMPARATIVE ANALYSIS OF HAZARDOUS PROCESSES:

United Kingdom

The Health and Safety at Work etc. Act, 1974 and the Control of Major Accident Hazards (COMAH) Regulations, 2015, which implement the European Union's Seveso III Directive, are the main laws governing hazardous industrial processes in the United Kingdom. The primary regulatory agency in charge of monitoring compliance is the Health and Safety Executive (HSE). Under this legal framework, facilities dealing with dangerous substances above specified thresholds are required to develop a Major Accident Prevention Policy (MAPP) and submit detailed Safety Reports that outline potential hazards, safety measures, and emergency preparedness protocols. Operators must also engage in risk assessment, ensure public information transparency, and coordinate with local authorities for off-site emergency planning. Failure to comply may result in criminal prosecution, enforcement notices, and facility shutdowns. The UK's model emphasizes proactive risk management, stringent inspection mechanisms, and strong enforcement, setting a high standard for industrial safety practices globally.

United States

In the United States, regulation of hazardous processes is primarily administered under the Occupational Safety and Health Act, 1970, enforced by the Occupational Safety and Health Administration (OSHA), and environmental statutes like the Clean Air Act (Section 112(r)) and CERCLA (Superfund Law), implemented by the Environmental Protection Agency (EPA). OSHA's Process Safety Management (PSM) standard is applicable to industries handling threshold quantities of highly hazardous chemicals. It requires that process hazard studies, operating procedures, mechanical integrity programs, employee training, and emergency planning be prepared and carried out. Simultaneously, under the EPA's Risk Management Plan (RMP) rule, facilities must assess potential off-site consequences of chemical releases and submit risk reduction strategies. U.S. courts reinforce these standards through doctrines of tort law, especially strict liability in ultra-hazardous activities, thereby ensuring dual accountability—regulatory and judicial. The U.S. framework is characterized by a combination of technical rigor, public disclosure, and legal deterrence.

Japan

The Industrial Safety and Health Act (ISHA) governs hazardous operations in Japan. It is supplemented by the Fire Services Act, the High Pressure Gas Safety Act, and other industry-specific laws. The Ministry of Health, Labour and Welfare (MHLW) oversees the enforcement of ISHA, which mandates hazard identification, risk assessments, and the establishment of control measures for chemical processes and machinery. Employers must develop comprehensive safety protocols, ensure continuous worker training, and conduct regular inspections. Following the Fukushima nuclear disaster in 2011, Japan has significantly tightened its risk governance regime, emphasizing disaster preparedness, early warning systems, and cross-sector coordination. Industrial operators are now

obligated to submit detailed disaster prevention plans, and large-scale facilities must maintain real-time hazard monitoring systems. Japan's model integrates technical precision with cultural values of collective responsibility, creating a unique regulatory approach that balances industrial development with stringent safety norms.

Australia

Australia manages hazardous industrial activities through Model Work Health and Safety (WHS) Laws, adopted by the Commonwealth and most states and territories. A key component of this framework is the regulation of Major Hazard Facilities (MHFs) under the WHS (MHF) Regulations. Facilities that store or process significant quantities of hazardous substances must develop and submit a Safety Case, which includes risk identification, control strategies, and emergency response planning. Safe Work Australia, in collaboration with state regulators such as WorkSafe Victoria and SafeWork NSW, ensures compliance through inspections, audits, and guidance. Employers are required by law to take reasonable steps to eliminate or reduce hazards as much as possible. The Australian model emphasizes consultation with workers, transparency, and continuous improvement, making it a participatory and forward-looking regulatory approach. Penalties for non-compliance range from improvement notices to criminal prosecution, thereby reinforcing accountability.

European Union

The European Union adopts a harmonized approach to managing hazardous processes through the Seveso III Directive (Directive 2012/18/EU). This directive applies to all member states and governs industrial establishments that store or use dangerous substances above specified thresholds. The directive mandates the development of a Safety Management System (SMS), internal emergency plans, and coordination with public authorities for off-site response planning. It also requires public disclosure of safety information and

mechanisms to inform and protect surrounding communities. A unique feature of the Seveso framework is its emphasis on land-use planning, which ensures that hazardous industries are sited at safe distances from residential or environmentally sensitive zones. National authorities are tasked with implementation and compliance monitoring, and they are empowered to conduct inspections, enforce administrative penalties, or revoke operating licenses. The EU model reflects a precautionary and preventive philosophy, integrating environmental justice and citizen participation into industrial safety governance.

CASE LAW ANALYSIS ON HAZARDOUS PROCESSES

The judiciary has played a significant role in interpreting and expanding the scope of legal protections related to hazardous processes under Indian law. Through judgments, Indian courts have not only reinforced the importance of worker safety but also contributed to the development of environmental jurisprudence, especially in the context of industrial hazards. The following case laws reflect the legal evolution and judicial response to hazardous processes in India.

1.M.C. Mehta v. Union of India (Oleum Gas Leak Case) [(1987) 1 SCC 395]

The Supreme Court introduced the doctrine of absolute liability, holding that enterprises engaged in hazardous or inherently dangerous activities are strictly liable for any harm caused, even without proof of negligence. This doctrine set a new precedent that went beyond the English principle of strict liability, eliminating exceptions like acts of God or third-party fault. This case directly influenced the 1987 amendment to the Factories Act, leading to the incorporation of Chapter IVA (Sections 41A to 41H), which specifically deals with hazardous processes.

2.Union Carbide Corporation v. Union of India-Bhopal Gas Tragedy [(1989) 2 SCC 540]

This case is often criticized for its inadequate compensation settlement, it played a key role in catalyzing legislative reforms. The Court acknowledged the necessity of strict regulatory frameworks as well as the state's responsibility to safeguard public safety and health. It was in response to this disaster that the Factories Act was amended in 1987 to introduce regulatory mechanisms such as mandatory disclosures, emergency standards, health surveillance, and workers' right to know about hazards.

3.Indian Council for Enviro-Legal Action v. Union of India [(1996) 3 SCC 212]

The Court held chemical industries liable for environmental damage caused in Bichhri village, applying the polluter pays principle. The judgment reinforced that industries undertaking hazardous processes are under a legal and moral obligation to internalize the cost of environmental degradation. It also emphasized the state's duty to enforce sections like 41B (disclosure of information) and 41C (workers' safety) of the Factories Act to ensure public accountability.

4.Vellore Citizens' Welfare Forum v. Union of India [(1996) 5 SCC 647]

The Supreme Court introduced the precautionary principle, stating that lack of scientific certainty should not be used as a reason to delay protective action in cases involving environmental and industrial hazards. The Court reiterated the need for continuous monitoring and strict compliance with environmental and occupational safety laws, indirectly strengthening the application of the Factories Act in such scenarios.

5. Consumer Education and Research Centre v. Union of India [(1995) 3 SCC 42]

This case dealt with the asbestos industry. The Court held that the right to health and medical care is a part of the fundamental right to life under Article 21. It mandated employers to provide safety equipment, periodic medical

checkups, and health insurance. This judgment strongly reinforced the objectives of Sections 41C and 41G of the Factories Act, which ensure that workers are made aware of hazards and participate in safety management.

7. Kurban Hussein Mohamedalli Rangawalla v. State of Maharashtra [AIR 1965 SC 1616]

In this case, A hazardous process in a paint manufacturing unit led to an explosion due to improper handling of turpentine. The factory was found to be operating without proper safety measures, leading to a fatal accident. The Supreme Court ruled that the process was inherently dangerous and required strict safety measures under the Factories Act. The court emphasized that factories engaging in hazardous processes must comply with safety regulations to prevent accidents.

8. Gujarat Mazdoor Sabha v. State of Gujarat [AIR 2020 SUPREME COURT 4601]

The case challenged amendments to the Factories Act that affected worker rights, particularly regarding working hours and safety conditions. The Supreme Court ruled in favor of protecting labor rights, stating that amendments should not compromise worker safety and well-being.

9. Subir Bose v. Inspector of Factories [2019 (9) SCC 454]

A dispute arose regarding compliance with safety regulations in a factory. The factory was found to be violating provisions related to hazardous processes. The court emphasized strict enforcement of the Factories Act, ensuring that industries adhere to safety standards to protect workers.

10. Sri B. Sri Kumar and Ors. v. State of Jharkhand [2008 (2) JCR 187 (JHR)]

The case involved occupational hazards in a factory where workers suffered fatal accidents due to lack of safety measures. The Court reinforced worker safety provisions under the Factories Act, mandating stricter compliance with safety regulations.

11. Vinod B. Chabriya v. State of Maharashtra [2001 (91) FLR 795]

The case dealt with unauthorized manufacturing processes in a factory without proper registration under the Factories Act. The Bombay High Court upheld penalties for non-compliance, reinforcing the importance of factory registration and adherence to safety norms.

CONCLUSION:

In this research, we have critically examined the regulation of hazardous processes under the Factories Act, 1948, particularly focusing on Section 2(cb), which defines hazardous processes, and Sections 41A to 41H, which outline the responsibilities of employers in ensuring safety in workplaces involving hazardous processes. While these provisions establish a legal framework to protect workers, the Act's implementation faces challenges, particularly in ensuring compliance and addressing emerging risks posed by technological advancements.

Comparative analysis with countries like the UK, US, Japan, Australia, and the EU reveals more advanced regulatory frameworks. These include stronger risk assessment practices, public transparency, and integrated emergency planning. For instance, the UK's COMAH regulations, the US OSHA standards, and Japan's ISHA mandate comprehensive safety cases, public disclosure, and disaster readiness, which go beyond the current Indian provisions.

In conclusion, while Section 2(cb) and Sections 41A to 41H of the Factories Act, 1948 establish a critical legal framework for regulating hazardous processes in India, the regulatory framework could be significantly enhanced by incorporating elements from international best practices. This includes more detailed risk assessment protocols, public disclosure of safety measures, and community engagement. Additionally, a more proactive and transparent approach to hazardous process regulation, as demonstrated in countries like the UK, US, and

EU, would help India align with global standards and improve worker safety and environmental protection.

India must modernize its hazardous process regulations to address emerging risks, ensuring that statutory provisions like Section 41A-H are not only enforced effectively but also updated to meet contemporary industrial challenges. Through these reforms, India can ensure a safer and more resilient industrial sector, aligning with the highest international safety standards.

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