

**IMPLEMENTATION OF CHEMICAL HAZARDOUS AND WASTE
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Abstract:

Proper chemical management is necessary to protect the health and safety of the University and surrounding communities and the environment. There are federal and state regulations that require all generators of chemical waste receive training and follow proper waste management and disposal procedures. These regulations have severe monetary and civil penalties associated with them. Between 1990 and 2004, over twelve million dollars in fines have been levied against University and Colleges for hazardous waste and other environmental violations, leading the EPA to question waste management at educational institutions.

1. Introduction:

India is a developing country, and industries is a major source of hazardous waste in developing countries, but industrial hazardous waste sources presents greater risks in developing countries than in developed countries because of poor management and obsolete technologies, multinational companies often set their plants in developing countries so, that they can use technologies banned in their house country. The accident at the Bhopal plant in India, which belonged to union carbide of USA is a prime example of this. The major source of hazardous solid wastes in our country are industrial activities, agriculture and Argo industries, medical facilities, commercial centers, household and the informal sector. Small competitive and labor intensive businesses that are not regulated by government are the source of hazardous solid waste that is currently recognized as major problem in developing countries. Hazardous waste in India has been defined as "any substance, excluding domestic and radioactive wastes, which because of its quantity and/or these wastes pose present or potential risks to human health or living organisms, due to the fact that they: are non-degradable or persistent in nature; can be biologically magnified; are highly toxic and even lethal at very low concentrations.

2. Experimental Details:

Chemical based safety training goes beyond teaching concepts and definitions by providing a virtual environment for interaction, practice, and immediate application of information. In this way, it reinforces roles and attitudes, contextualizes information, and serves as a content-rich foundation for a safety culture. This type of training has been used for decades by high-efficiency organizations because they understand that only a fraction of learning effectiveness comes from completing lower-level tasks, such as recalling terminology and procedures. The complex application of concepts is achieved through personalized experiences and unconstrained decision-making with realistic consequences. Safety training is an important bottom line for any safety culture, and simulation-based electrical safety training offers trainees a robust, personalized experience that engages and empowers them far beyond the classroom. Technology has consistently been propelled by the human desire to increase efficiency and manage knowledge, while simultaneously achieving a deeper personal understanding of our surroundings. Whether learning through books, diagrams, videos, or interaction, humans have capitalized on our natural tendency to organize and apply information in a way that enables us to better understand it. In recent years it has become common to use presentations, hands-on demos and e-learning as a means to facilitate the mastery of skills.

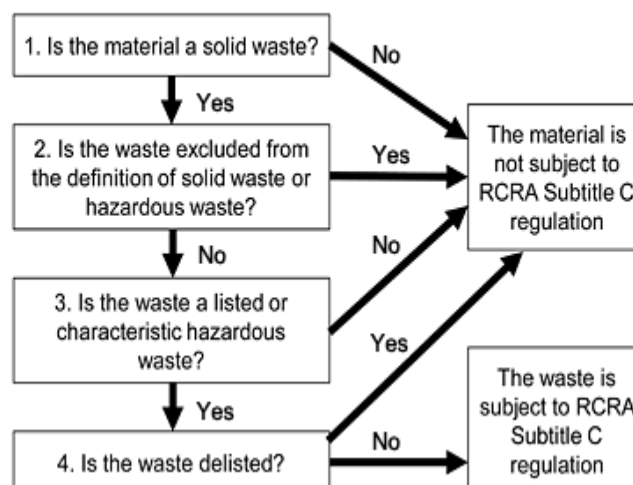
3. Methodology:**The Hazardous Waste Identification Process**

Figure 1: Methodology

4. Problem Identification:

The following are the unsafe behaviors defined by the industry while the employees working

- Adjusting / cleaning /loading & unloading condition
- Two hand control operated by two persons
- Working height without safety belt & helmet
- Pneumatic tools like doors, guns, lines wrong handling
- Pulling the trolley during materials movements affects
- Handling chemicals without PPEs (Goggle, face shield, rubber gloves, aprons)
- Non adherence of PPE
- By passing the existing safety mechanisms

5. Literature Review:

Kirk R. Smith, Richard A. Carpenter published a paper on the title “Chemical Waste Guide”, this paper explains the effects of training content, India is a Party to the Basel Convention on trans boundary movement of hazardous wastes. The Basel Convention is a tool for controlling and reduction of trans boundary movements of hazardous and other wastes subject to the Convention, Prevention and Minimization of their generation, environmentally sound management of such wastes and for active promotion of the transfer and use of cleaner technologies. As a party to the Convention, India is obliged to regulate and minimize the import of hazardous waste or other wastes for disposal or re-cycling and also to prohibit export of waste to parties, which have prohibited the import of such wastes. India is also required to minimize generation of hazardous waste in the country taking into account social, technological and economic aspects (NEERI).

Dr. K. Syamala Devi, O. Sujana and Dr. T. Charan published a paper on the title “GIIRS Emerging Market Assessment Resource” this paper explains the effects of training content Singh Hazardous Waste Management in India India is a developing country, and industries is a major source of hazardous waste in developing countries, but industrial hazardous waste sources presents greater risks in developing countries than in developed countries because of poor management and obsolete technologies, multinational companies often set their plants in developing countries so, that they can use technologies banned in their house country. The accident at the Bhopal plant in India, which belonged to union carbide of USA is a prime example of this situation (Khan Danielle J).

Sheri Shriance Jain. Ms Anamika Sagar and Shri Satish Kumar (2017), published a paper on the title “End-of-waste and by-product hazard and risk assessment “this paper explains the effects of training content The Waste Framework Directive provides the definition for when a material is a waste, when it ceases to be waste and when it is a by-product. Defray (2012) provides guidance on the legal definition of waste and its application. Article 6 of the Waste Framework Directive 2008 sets out that a material ceases to be waste when, the waste has been converted to a distinct and marketable product .the waste-derived product can be used in exactly the same way as a non-waste material. the waste-derived product can be stored and used with a ‘no worse’ environmental effect compared with the non-waste material it is intended to replace . Article 5 of the Waste Framework Directive 2008 sets out the criteria for a production residue to meet the by-product test further use is certain the material can be used directly without any further processing other than normal industrial practice the material is produced as an integral part of the production process further use is lawful, that is, the material fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts This guidance relates to the last of these two sets of criteria: how to conduct a risk assessment to demonstrate that the environmental and human health impacts are not adverse.

Brakeman Early (2015 title “Hazardous Waste Management and Treatment” Hazardous this paper explains the effects of training content wastes refer to wastes that may, or tend to, cause adverse health effects on the ecosystem and human beings. These wastes pose present or potential risks to human health or living organisms, due to the fact that they The above list relates only to the intrinsic hazard of the waste, under uncontrolled release, to the environment, regardless of quantity or pathways to humans or other critical organisms The criteria used to determine the nature of hazard include toxicity, phytotoxicity, genetic activity and bio-concentration. The threat to public health and the environment of a given hazardous waste is dependent on the quantity and characteristics of the waste involved. Wastes are secondary materials, which are generally classified into six categories as inherently waste: like materials, spent materials, sludge’s, by-products, commercial chemical products and scrap metals. Solid wastes form a subset of all secondary materials and hazardous wastes form a subset of solid waste. However, note that certain secondary materials are not regulated as wastes, as they are recycled and reused.

6. Classifications of Hazards:

- **Ignitability:** A waste is an ignitable hazardous waste, if it has a flash point of less than 60C; readily catches fire and burns so vigorously as to create a hazard; or is an ignitable compressed gas or an oxidizer. Ex: Naphtha, lacquer thinner, epoxy resins, adhesives, oil based
- **Corrosively:** A liquid waste which has a pH of less than or equal to 2 or greater than or equal to 12.5 is considered to be a corrosive hazardous waste. Sodium hydroxide, a caustic solution with a high pH, is often used by many industries to clean or degrease metal parts. Hydrochloric acid, a solution with a low pH, is used by many industries to clean metal parts prior to painting. When these caustic or acid solutions are disposed of, the waste is a corrosive hazardous waste.
- **Reactivity:** A material is considered a reactive hazardous waste, if it is unstable, reacts violently with water, generates toxic gases when exposed to water or corrosive materials, or if it is capable of detonation or explosion when exposed to heat or a flame. Examples of reactive wastes would be waste gunpowder, sodium metal or wastes containing cyanides or sulphides.

- **Toxicity:** To determine if a waste is a toxic hazardous waste, a representative sample of the material must be subjected to a test conducted in a certified laboratory. The toxic characteristic identifies wastes that are likely to leach dangerous concentrations of toxic chemicals into ground water. Hazardous Waste can be classified into –
 - Solid Wastes
 - Liquid Wastes
 - Gaseous Waste

7. Conclusion:

The Indian government promulgated the Environment (Protection) Act in 1986, which is umbrella legislation to protect and improve the environment and to regulate the management and handling of hazardous substances and chemicals. The Ministry of Environment and Forests continuously monitors the progress made by various state governments and union territories with respect to the implementation of India's Hazardous Wastes Rules. Experience in India shows that most industries respond to environmental issues by complying with Government regulations, but if corporations do take an antagonistic position towards regulations, they continue to be burdened with ever-increasing regulations and adverse judicial pronouncements. In the future, the corporations need to be proactive and set voluntary standards for environmental protection and safety that minimize the chance that illogical and ill-conceived regulations and standards are adopted. This, in turn, requires a comprehensive, constructive and cooperative policy-making process to shape national environmental policies and regulations. Even after efforts to reduce waste are undertaken, some residuals will remain that warrant innovative treatment and disposal methods. Developing countries should learn from the experiences of developed nations regarding their hazardous waste management system and its related problems and also keep looking for new and innovative solutions that achieve a better fit with the limited resources available to developing countries.

8. References:

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