

Occupational Safety in Shared Industrial Workplaces

K. Velusamy¹, G. Manikandan², Azadh moosa³

ABSTRACT: Occupational safety and health is a very imperative issue and is defined as the condition of being safe and ensuring that occupational accidents and work-related ill-health is prevented as much as possible and safe working environment is promoted. The foundry industry is the backbone of other industries and the growth of industrialization and industrial prosperity can be measured by the growth of the foundry industry. The working environments in foundries are characterized by a combination of mechanical, chemical, physical and environmental hazards to mankind. Occupational safety is an important aspect of industries, to protect the workers, supervisors, management and staff employed in them apart from improving productivity by reducing the losses that may arise due to occurrence of accidents. Foundry work consists of several specialized, interlocking jobs carried out by heavy labor force such as molding and pattern making, core producing, melting and pouring, shakeout and core knockout, cleaning, chipping, and finishing. All these multitude activities expose the workers to various occupational health hazards. As per International Labor Organization, the responsibility for occupational safety and environment aspects rests with employer, employee and government. All the stakeholders should work jointly for enhancing occupational safety and environmental standards in small-scale foundries to make them meet the global requirements. The aim of the study to enhance the knowledge and awareness among workers, management and staff apart from making the small-scale foundries free from hazards and risks, limited to the extent of foresee ability, thus resulting in safer, healthy and environmentally-friendly small-scale foundries.

Keywords: ILO, OSH.

Date of Submission: 18-08-2022

Date of acceptance: 02-09-2022

I. INTRODUCTION:

Occupational Safety and Health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards. Its goal is to prevent accidents and harm to people from work-related activities. Prioritizing OHS at your business has several key benefits, including: Reduced risk or accidents or injuries by identifying and mitigating hazards. Improved efficiency and productivity due to fewer employees missing work from illness or injury. It is an employer's duty to protect the health, safety and welfare of their employees and other people who might be affected by their work activities. Employers must do whatever is reasonably practicable to achieve this. Industries are a major source of national income and employment development in all the sectors. Overall, industrial development holds a very unique performance for industrial growth in India. The Indian economy has made great pace since the independence and development in the entire sector. The objective of the commission was to improve production to the maximum possible extent to achieve higher levels of national per capita income and full employment. ". A "five-factor accident sequence" is proposed in which each factor would actuate the next step in the manner of tumbling dominoes lined in a row. The sequence of accident factors is as follows Ancestry and social environment, Worker's fault, Unsafe act together with mechanical and physical hazard, Accident, Damage or injury [1]. Behavioral factors, which include factors pertaining to the worker, such as inappropriate attitude, lack of knowledge, lack of skills and inadequate physical and mental condition. Environmental factors, which include improper guarding of other hazardous work elements and degradation of equipment through use and unsafe procedures. The major contribution of this theory is to bring out the fact that rarely, if ever, an accident is the result of a single cause or act [2]. According to the pure-chance theory, every one of any given set of workers has an equal chance of being involved in an accident. It further implies that there is no single noticeable pattern of events that leads to an accident [3]. The biased-liability theory is based on the observation that once a worker is involved in an accident, the probability of the same worker becoming involved in future accidents either increase or decrease as compared to the rest of workers [4]. It is felt that if indeed this theory is supported by any empirical evidence at all, it probably accounts for only a very low proportion of accidents without any statistical significance [5]. This theory is useful for determining injury causation and evaluating energy hazards and control methodology. Strategies can be developed which are preventive, limiting with respect to the energy transfer. Control of energy transfer at the source can be achieved by the elimination of the source, changes made to the design or specification of elements of the work-station, by preventive maintenance [6]. Recent emphasis on the preventative and precautionary approaches to decision making denotes a shift towards attempts to

manage risks to the environment. Managing risk means finding ways to reduce, mitigate, or simply learning to live with risks. How this is done depends often on acceptability of the risk [7].

II. OCCUPATIONAL SAFETY AND HEALTH

Occupational safety and health is one of the most important features of human concern when they are in the working environment or during their personal behavior. It aims an adaptation of working environment to workers for the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations during their entire service periods. The amendment introduced demanded a change from dealing with disaster or disease to prevention of its occurrence.

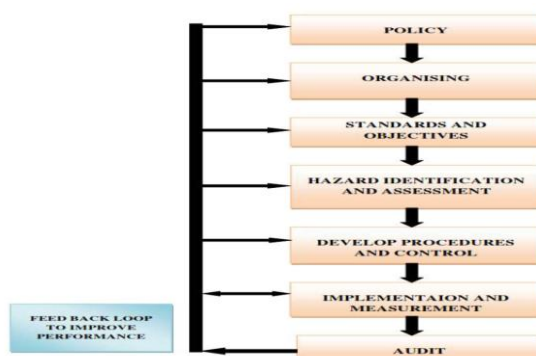
➤ **OSH service system:** The elements of OSH service System are policy, organizing, planning, and implementation, measuring performance, audit, and review. Based on these policies, different ministries and affiliated divisions or departments are responsible for the administration of occupational health services in the country.



➤ **OSH challenges:** The challenges were related to: the gap in the existing legal framework, limited human capacity, poor planning, limited transparency and accountability, and low public awareness about OSH. The most important challenges for occupational health for the future will be health hazards associated with innovative biotechnologies, Occupational health problems linked to latest information technologies and automation system.

➤ **OSH elements:** Planning. Implementation and operation. Measuring performance. Auditing and reviewing performance these are element of OSH. The essential elements for effective workplace in improving workers health and safety is listed and the elements are intended to identify and support comprehensive approaches to reduce workplace hazards and promote worker health and well-being both physical and organizational.

➤ **Hazard management system:** Hazard management is the process which improves worker safety by providing measures to reduce fatalities and injuries to workers in the field of transportation construction and maintenance tasks.



III. FOUNDRY SAFETY PRACTICES

The foundry work environment presents dangerous conditions, particularly around furnaces and other equipment used in the production of metal castings. All foundry men should wear protective clothes, glasses, shoes, and gloves while handling molten metal for casting process.

➤ **Personal protective equipment:** Personal Protective Equipment helps prevent staff emergencies on the job due to inhalation, absorption, irritants, or other prolonged contact with a cleaning chemical. This actively reduces accidents, improves the health of your employees, and makes for a safer, secure work environment.

➤ **Foundry Safety:** Safety committee is an organization group that operates within a workplace and is composed of members from its various departments, including management, frontline workers, and office staff. The main purpose of a safety committee is to mitigate the risk of workplace injuries and illnesses. There is a

particular safety concern in the foundry industry about moisture and moisture that can be hazardous even in small amounts.

➤ **Safety Improvement Teams:** Building an engaged safety team is the best way to ensure an effective and sustainable workplace safety program within your organization. Safety teams provide many benefits including: Combining knowledge and experience of management and labor. Focusing on real problems and actions in a timely and efficient manner.

➤ **Infrastructure creation:** Technology here refers to process changes that include proper charging of material into the furnace that not only reduces the coal consumption but also the ambient temperature for the workers to be able to work comfortably. Infrastructure creation in enterprises may lead to setting up of toilets, eating area or relaxation area if the same does not exist and in case these facilities exist, better maintenance of the same will be included. In addition to the above, there are many other minor and insignificant aspects and issues which need to be addressed overall, for a safe and healthy workforce all around the foundry clusters.

➤ **Challenging task:** Activities under the occupational safety area will also cover preventive and curative aspects to ensure sustainability. These activities will also require organization of workshops, exposures, introduction of equipment suppliers, preparation of comparative charts for variety of equipment, undertaking internal studies for understanding & conveying commercial viability of equipment to be bought.

➤ **Safety inspection:** Manufacturing organizations are aware of the risks involved, and the potential for serious accidents, in foundries. There are even professionals dedicated to minimizing these risks by adopting and implementing appropriate safety measures.

IV. CONCLUSION

Health and safety policy, and safety and health organization interms of having dedicated staff and officers to deal on safety were not available as these are fundamental requirements to ensure safety. Communication system and training and maintenance procedures are not provided within the foundries as well as a major section of the workforce reflected stress at work. Safety educational and training is not ensured periodically. In the future study discuss about the occupational health and safety system. Waste disposal system, emergency planning system, pressure vessels, lifting machines and tackles safety and gas cylinder storage Safety are not ensured in the small-scale foundries. Use pneumatic and enclosed conveying systems, particularly for transferring and feeding sand in the molding section. In that, dust-controlled transfer points must be provided in the line path. Improve technical measures for upgrading and optimizing the existing scrubbers or install new technique by repairing and cleaning the scrubber, spraying nozzles and drop let collector. Management and technical elements of occupational safety, health and environment aspects needs to be given high priority and implementation ensured without any dilution. The monitoring and surveillance mechanism for occupational safety, health and environment aspects shall be ensured in the small-scale foundries. The guidelines of occupational safety, health and environment management system (OSHEMS) shall be followed in the small-scale foundries. Adequate safety budget should be made available in the small-scale foundries indicating lack of resources. Dedicated personnel to deal with occupational safety, health and environment aspects shall be made available in most of the small-scale foundries. Legal compliance monitoring and sustainability shall be ensured for occupational safety, health and environment in the small-scale foundries.

REFERENCES

- [1]. Zakaria A M, Noweir K H & El-Maghrabi G, 2005, „Evaluation of Occupational Hazards in Foundries“, The Journal of the Egyptian Public Health Association (JEPHAss), Vol. 80 No. 3 & 4, pp. 432- 462.
- [2]. Annemarie F & Williamson A M , 1991, ‘A classification system for causes of occupational accidents for use in preventive strategies’, Scandinavian Journal Work Environment and Health, Vol.17, pp. 302 – 311.
- [3]. Floyde A, Lawson G, Shalloe S, Eastgate R & Cruz M D, 2013, „The design and implementation of knowledge management system and learning for improved occupational health and safety in small to medium sized enterprises“, Journal of Safety Science, Vol. No. 60, pp. 69-76.
- [4]. Alison G & Vredenburgh, 2002, „Which management practices are most effective in reducing employee injury rates“, Journal of Safety Research, Vol. 33, No. 2, pp. 259-276.
- [5]. Armstrong T J , Marshall M M, Martin B J & Foulke J A, 2002, „Exposure to forceful exertion and vibration in a foundry“, International Journal of Industrial Ergonomics, Vol. 30, No.3, pp. 163-179.
- [6]. Andersson R, & Menckel E, 1995, „On the prevention of accidents and injuries: A comparative analysis of conceptual frameworks“, Accident Analysis and Prevention, Vol. 27, No. 6, pp. 757-768.
- [7]. Aas A L, Johnsen S O & kramstad T S, 2009 „A human factors verification and validation methodology“ CRIP, Springer, Berlin Heidelberg, Vol. 5775, pp. 243-256.
- [8]. Arunraj N S & Maiti J, 2009, „Environmental risk management and decision making“, International Journal of Environmental pollution Control and Management, vol 1, pp. 25-40.

BIOGRAPH

Dr.K.VELUSAMY

Received the B.Engineering Degree from Thigarajar College of Engg at Madurai in 1988. The M.E Degree Jayaram college of Engg and Technology at



Tiruchirappalli in 2009. The Ph.D Degree Anna University at Chennai in 2018. He has been working as Professor in Annai Mathammal Sheela Engineering College, Erumapatty, Tamilnadu, India. His research interest in manufacturing technology.

Mr. G.MANIKANDAN

Received the B.Engineering Degree from Annai Mathammal Sheela Engg College at Namakkal in 2013. The M.E Degree from Annai Mathammal Sheela Engg College at



Namakkal in 2015. He has been working as an Assistant professor in Annai Mathammal Sheela Engineering College, Erumapatty, Tamilnadu, India. His research interest includes manufacturing technology.

Mr. AZADH MOOSA

He obtained his ME degree of ISE at Annai Mathammal Sheela Engg College at Erumapatty in 2022. He obtained his B.Tech -Chemical Engg at Sathyabama University



at Chennai in 2018. His research interest include Safety Engineering.