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Safety Management Systems and Technology for Occupational Health and Safety

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ABSTRACT

With the increasing importance of Labour Jurisprudence, there have been many technological advancements in the Field of Occupational Health and Safety, which are very crucial for risk management and prevention of industrial hazards. The aim of this paper is high light such Technological advancements and highlight the Importance of such advancement. Also, to Suggest how small-scale industries benefit from these advancements.

Keywords: *Safety Management Systems, OSHA, EHS, Telematics, Check Technology, Risk management.*

I. INTRODUCTION

Occupational health and safety have always been one of the key aspects of human concern. Employees are considered to be one of the most important assets for an organisation, and thus their health and safety should be promoted and maintained to the highest degrees of mental and physical health.

In response to the changing social, technological, political and economic factors, the scope of occupational health and safety has gradually and continuously evolved over the period. The emergence and development of new products and their processes and other technical advancements affect safety and health in the world of work.

The data suggests that on an estimated basis, work-related injuries and diseases each year kill 2 million people worldwide and state the occurrence of 160 million new cases of work-related diseases. A large proportion of the work sites, even in advanced economies, are not inspected regularly for occupational health and safety, with developing countries having only 5-10% of the workers get access to adequate health services.²

Thus, the role of occupational health and safety lies in designing ways for the provision of proper health services and a safe and supporting work environment under all circumstances, by the employer, for all their employees. Its positive impact is seen in the form of a reduction in

¹ Author is a Lawyer in India.

² Takela Tedesse and Mangesha Admassu, *Occupational Health and Safety*, University of Gondar, 3 (2006), available at, https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_occupational_health_students/ln_occ_health_safety_final.pdf

work related injuries and deaths, which means cost benefits for both employers and employees and greater work efficiency.

At present, the constitutional framework of India secures all the rights of the workers providing for their safety, strength and well-being. It seems that the citizens, forced by any economic necessity, do not enter avocations unsuited to them in respect of age or strength. It ensures just and humane work conditions for all and also checks that children under the age of 14 are not employed in any hazardous work.³

All of this is ensured through four main legislations: (i) The Factories Act,1948 (ii) The Mines Act,1952 and Mines Rules,1955 (iii) The Dock Workers (Safety, Health and Welfare) Act,1986 (iv) The Building and other Construction Workers (Regulations of Employment and Conditions of Service) Act,1996.⁴

One of the International Standards for Occupational Health and Safety Management Systems is OHSAS 18001, which provides a proper framework for the effective management of OHS and includes all aspects of legal compliance and risk management. It helps organisations to achieve the best possible working conditions by putting in place all the procedures, policies and controls needed. However, ISO 45001 (published on March 12, 2018) has now replaced OHSAS 18001, which is the international standard for OHSMS, and it will be a three-year period to upgrade to it.

II. COMMON WORKPLACE HAZARDS

The 6 most common workplace hazards are:⁵

- Safety Hazards
- Ergonomic Hazards
- Environmental hazards
- Chemical Hazards
- Biological Hazards
- Work Organization Hazards

Factors Causing Health and Safety Hazards

³INDIAN CONST. art 24, art 39, art 42, art 43A

⁴ Directorate General Factory Advice Service and Labour Institutes, *National Occupational Safety and Health (OSH) Profile*, 1-2, available at <http://www.dgfasli.nic.in/Nat-OSH-India-Draft.pdf>

⁵ Greg Andress, *6 Workplace Hazards you need to be aware of*, Frank Krum (Oct 11,2019,08:29 AM), <https://blog.frankcrum.com/most-common-workplace-hazards>

The following are the factors that cause health and safety hazards:⁶

- People
- Equipment
- Material
- Environment
- Process

III. SAFETY MANAGEMENT SYSTEM (SMS)

A businesslike approach to safety is Safety Management System (SMS).⁷ SMS is a systematic and efficient process for managing safety and related risks in an Industry. It manages safety in an organised manner, including accountabilities, organisational structures, policies and procedures.⁸ It is a comprehensive plan which provides opportunities for preventing workplace risks and thereby promoting occupational health and safety.

IV. SMS PROCESS

Safety Management System is a 4-step process.⁹

- This starts from framing safety procedures, policies, and implementation of SMS.
- Then identification of risks & industrial hazards, incident reporting & investigation, emergency response planning.¹⁰
- Then checking SMS through safety performance monitoring, safety survey, and Safety audits, both Internal and external.
- Finally, safety promotion through training and education and safety promotion.

Apart from SMS¹¹ being a preventive measure that helps industries in avoiding occupational risks and Hazards, the components of SMS are the requirements for OSHA or ISO 45001 certification. It acts as a process to comply with international standards for occupational health

⁶ Aditya Yellapantula, *5 factors that cause health and safety hazards*, 4S consulting services Inc. (Oct 11,2019, 08:34), <https://www.4sconsult.com/5-factors-that-cause-health-and-safety-hazards/>

⁷ Safety management international collaboration group, *A senior manager's role in safety management system*, 15(2016), available at <https://www.skybrary.aero/bookshelf/books/1781.pdf>

⁸ Civil Aviation Safety Authority, *What is Safety Management and Safety management systems ?*, Civil Aviation Safety Authority Australian Government (Oct 11, 2019, 08:59 AM), <https://www.casa.gov.au/safety-management/safety-management-systems/what-safety-management-and-safety-management-systems>

⁹ ACI World Safety and Technical Standing Committee, *Safety Managements Systems Handbook 2 -4* (1 ed. ACI World 2016), available at https://cfapp.icao.int/tools/RSP_ikit/story_content/external_files/2016%20ACI%20SMS%20Handbook_WEB_FINAL.pdf

¹⁰ *ibid*

¹¹ Safety Management Systems

and safety.



Now a days SMS use technologically advanced tools for fulfilling its various steps and ensure safety management which are discussed after this.

V. TECHNOLOGY IN OCCUPATIONAL HEALTH AND SAFETY (OHS)

With the technological advancements in boom OHS¹² also gets a technologically developed toolset for its execution. With such a technological advancement the standards of OHS have been improved widely.

These technological advancements not only come up with safety management systems but also stores information for future use. Some technological advancements in the field of OHS are:

- Projected safety signs
- Check in technology
- Drones
- Autonomous vehicles
- 3D Visualizations
- AI SAFE
- Environmental Health and Safety software
- Telematics
- Smart - Personal protective Equipment

(A) Projected Safety Signage

All kinds of works involve certain dangers to safety and health of the workers and thus there's a challenge faced by the industrial & warehousing facilities to safely plan pedestrian and vehicle traffic like highlighting safety features on floors, walls or machinery and other traffic signs and routes. All these earlier involved repeated expenses for remarking or repainting and risking the

¹² Occupational Health and Safety

safety of workers as they get faded easily.¹³ However, today there's available a more reliable and cost-effective technology to overcome all these problems which is the projected safety signage. Its only requirement is a projector and a gobo¹⁴ which is to be installed close to the projection area. Apart from being highly durable and interchangeable, it clearly projects the safety message even in poor lighting conditions.

(B) Check In Technology

Monitoring employees and their safety has now become more effective with the modern check in technologies by increasing the capability for quick incident detection, employee locating and response management.¹⁵ Earlier manual check ins resulted in delayed assistance where an employee working alone and needing help could go unnoticed for up to two hours. This new technology however serves as the required solution to the issue.

(C) Autonomous Vehicles

Autonomous vehicles are now the new go to additions for any business which looks forward to enhance the workplace safety. This is a driverless vehicle helping employees to get from one area to another while detecting its lane and making appropriate changes if blocked by any hurdles, avoiding collisions.

(D) Drones

Drones usage, today, has cleverly been adopted in the workplace to prioritize health and safety. They are being used by business as they allow comparatively easier access to dangerous areas including those which are too hot, cold or small for employee access. Thus the required data are collected and delivered timely without putting the employees' safety at risk.¹⁶

a. D Visualizations

This technology serves as an all-round solution covering almost all types of hazards.¹⁷ It helps in employee trainings and familiarizes the workers with the work environment enabling them to avoid any kinds of hazards and injuries, thus completing their work in safest way possible.

¹³ Gobo service, *Projected Safety Signage*, GOBOSERVICE by surland optics (Oct,11,2019, 09:19 AM), <https://goboservice.com/en/products/projected-safety-signage>

¹⁴ Gobo is a high temperature resistant and durable glass filter on which is laser- etched the image to be projected

¹⁵ Brendon Cook, *Automated Lone Worker Check- In Technology*, Blackline Safety Corp. (Oct,11,2019, 09:25 AM, <https://www.blacklinesafety.com/blog/lone-worker-monitoring-technology-benefits-your-bottom-line>

¹⁶ Open Access Government, *Workplace Technology - How has it impacted health and safety?*, Open Access Government (Oct, 11, 2019, 09:32 AM), openaccessgovernment.org/workplace-technology-how-has-it-impacted-health-and-safety/47540/

¹⁷ Srushti VIZ, *How 3D visualization can make your workplace safer – The importance of visualization in work safety*, Srushti (Oct,11, 2019, 09:35 AM), <https://srushtiviz.com/blog/how-3d-visualization-can-make-your-workplace-safer-the-importance-of-visualization-in-work-safety/>

b. AI SAFE

Automated Intelligent System¹⁸ for Assuring Safe Working Environments, commonly referred to as AI-SAFE that uses advanced algorithms and video analysis to check that employees are correctly kitted out with all the safety equipment they require. Mounted above entry and exit points are video cameras to detect if workers are wearing the right equipment and restrict entry to the non-compliant employees.¹⁹

(E) EHS Software

Environmental Health and Safety (EHS) software is a database driven enterprises software.²⁰ These are affordable software solution designed to automate, streamline, improve compliance and manage medical records while anticipating health issues via sophisticated analysis of records, trends details and other statistics. This allows to manage, track and record health and safety metrics of an enterprise and sets a platform to address the requirements of International standards. It ensures incidents & risk management, audits & supervision, training and compliance.²¹

(F) Telematics

It is a broad and general term that refers to combination of telecommunications and informatics to store receive and transmit information to remote objects from telecommunication devices over a network.²²

This technology proves helpful the construction business as this regulate and manage fleet movements and vehicular moments.²³ This technology tracks assets and equipments and also conducts inspection thereby alerts workmen regarding the maintenance and this in return avoids workplace injuries due to faulty machineries. This tracking are also recorded which are further used for training.²⁴

(G)PPE

¹⁸ Cisco and Cortexia Vision Systems are mainly working on this technology

¹⁹ Nick Crissos, *Introducing AI-SAFE: a collaborative solution for worker safety*, Cisco UK and Ireland Blog (Oct,11, 2019, 09:59 AM), <https://gblogs.cisco.com/uki/introducing-ai-safe-a-collaborative-solution-for-worker-safety/>

²⁰Data Pipe, *EHS software*, Data Pipe USA Inc (Oct,11, 2019, 10:04 AM), <http://www.knorrassociates.com/ehs-software.asp>

²¹ Environment Leader, *Special Report: EHS Management A Look Forward to 2018* , available at <https://www.environmentalleader.com/wp-content/uploads/2017/11/EHS-SpecialReport-1.pdf>

²² Margaret Rouse, *Telematics*, Tech Target (Oct,11,2019, 10:21 AM), <https://searchnetworking.techtarget.com/definition/telematics>

²³ Kathy Wells, *Telematics expert answers questions to address rising concerns about jobsite safety*, Construction Business Owners (Oct,11, 2019, 10:14 AM), <https://www.constructionbusinessowner.com/safety/exploring-safety-telematics>

²⁴ *ibid*

Smart Personal Protective Equipment (PPE) are being implemented by the employers to help and prevent employees' exposure to various hazards through the real-time safety information gathered which is used to send notifications so that internal and external conditions are adjusted. This means that exact incidents like when an employee trips or falls, carries enormous weight or loses their balance, are detected by the site managers.

These smart PPE can be implemented by the employers in many forms including smart helmets, smart glasses, cold wear, location devices, fatigue monitors, light emitting clothing and environmental sensor clothing.²⁵

VI. CONCLUSION

According to the research it is concluded that safety management systems and technological advancements in the field of occupational health and safety go hand in hand. Technological advancements proved to be a boon for Safety management systems and preventive measures for occupational hazards and risks. Mainly the technological advancements which I propose to be adopted by every industry are EHS software, Drones and Check In technologies.

OSHA or ISO 45001 accreditations provide international standards for occupational safety and health. However, as they are not yet mandatory, they should be made so because the Indian constitutional framework provides Articles which mandate favourable and humane working conditions and occupational health and safety and also because there has been an increasing importance of labour jurisprudence.

However, most of the Indian industries are under the MSME category, and the workman population is mainly categorised as unorganised. This makes the adoption of such technological advancements in this respect a costly affair for individual firms. All of this makes Indian industries take a back seat when it comes to dealing with occupational health and safety.

I would suggest that every industrial group should be divided into groups of 15-20 small-scale businesses, and each of such divisions should be provided with access to EHS software so that they can also feed in their details for ensuring risk and safety management. Adding on to it, there should be a provision for setting up a department which would provide the industrial units with drones and also would ensure proper monitoring of the safety-related issues.

²⁵supra note 15

VII. REFERENCES

1. Takela Tedesse and Mangesha Admassu, *Occupational Health and Safety*, University of Gondar,(2006), https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_occupational_health_students/ln_occ_health_safety_final.pdf
2. Directorate General Factory Advice Service and Labour Institutes, *National Occupational Safety and Health (OSH) Profile*, <http://www.dgfasli.nic.in/Nat-OSH-India-Draft.pdf>
3. Greg Address, *6 Workplace Hazards you need to be aware of*, Frank Krum (2017) <https://blog.frankcrum.com/most-common-workplace-hazards>
4. Aditya Yellapantula, *5 factors that cause health and safety hazards*, 4S consulting services Inc.(2017), <https://www.4sconsult.com/5-factors-that-cause-health-and-safety-hazards/>
5. Safety management international collaboration group, *A senior manager's role in safety management system* (2016), <https://www.skybrary.aero/bookshelf/books/1781.pdf>
6. Civil Aviation Safety Authority, *What is Safety Management and Safety management systems?*, Civil Aviation Safety Authority Australian Government, <https://www.casa.gov.au/safety-management/safety-management-systems/what-safety-management-and-safety-management-systems>
7. ACI World Safety and Technical Standing Committee, *Safety Management Systems Handbook 2 -4* (1 ed. ACI World 2016), https://cfapp.icao.int/tools/RSP_ikit/story_content/external_files/2016%20ACI%20SMS%20Handbook_WEB_FINAL.pdf
8. Gobo service, *Projected Safety Signage*, GOBOSERVICE by surland optics), <https://goboservice.com/en/products/projected-safety-signage>
9. Brendon Cook, *Automated Lone Worker Check- In Technology*, Blackline Safety Corp.(2016), <https://www.blacklinesafety.com/blog/lone-worker-monitoring-technology-benefits-your-bottom-line>
10. Open Access Government, *Workplace Technology - How has it impacted health and safety?*, Open Access Government, openaccessgovernment.org/workplace-technology-how-has-it-impacted-health-and-safety/47540/

11. Srushti VIZ, *How 3D visualization can make your workplace safer – The importance of visualization in work safety*, Srushti (2017), <https://srushtiviz.com/blog/how-3d-visualization-can-make-your-workplace-safer-the-importance-of-visualization-in-work-safety/>
12. Nick Crissos, *Introducing AI-SAFE: a collaborative solution for worker safety*, Cisco UK and Ireland Blog (2018), <https://gblogs.cisco.com/uki/introducing-ai-safe-a-collaborative-solution-for-worker-safety/>
13. Data Pipe, *EHS software*, Data Pipe USA Inc (2019), <http://www.knorrassociates.com/ehs-software.asp>
14. Environment Leader, *Special Report: EHS Management A Look Forward to 2018* , <https://www.environmentalleader.com/wp-content/uploads/2017/11/EHS-SpecialReport-1.pdf>
15. Margaret Rouse, *Telematics*, Tech Target, <https://searchnetworking.techtarget.com/definition/telematics>
16. Kathy Wells, *Telematics expert answers questions to address rising concerns about jobsite safety*, Construction Business Owners (2017), <https://www.constructionbusinessowner.com/safety/exploring-safety-telematics>
