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ROLE OF ISO 45001 IN ENHANCING WORKPLACE SAFETY IN MANUFACTURING INDUSTRIES

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ABSTRACT

Occupational diseases, occupational health and safety (OHS) have become a very important issue in manufacturing. Manufacturing facilities have complicated gear, dangerous materials, and risky procedures, therefore it's important to have good safety management systems in place. The international standard for Occupational Health and Safety Management Systems (OHSMS), ISO 45001, gives a methodical way to find hazards, evaluate risks, and put in place safety measures to make the workplace safer. This study investigates the function of ISO 45001 in improving worker safety within manufacturing sectors.The research employs a descriptive and analytical design, utilising both primary and secondary data sources. Structured questionnaires and interviews with safety managers, supervisors, and workers in chosen manufacturing units were used to collect primary data. Secondary data came from industry publications, safety audit records, and earlier research projects. To see how well ISO 45001 was put into practice, we looked at safety performance indicators such the accident frequency rate, severity rate, near-miss reporting, and following safety rules.The study's results show that manufacturing companies that are ISO 45001 certified have much better workplace safety outcomes than those who are not. There was a clear drop in occupational accidents, better danger identification, more worker participation, and better compliance with laws and rules. ISO 45001 also helped create a positive safety culture by encouraging continuous improvement, making employees more aware of safety issues, and getting management to care about occupational health and safety.The study finds that ISO 45001 is very important for improving safety in the workplace in manufacturing businesses. Following the standard correctly not only lowers the chances of work-related injuries, but it also makes the organisation more efficient and long-lasting. The study shows how important it is to add ISO 45001 to current management systems in order to make safety gains that last.

KEY WORDS: *ISO 45001, health and safety at work, safety in the workplace, safety management system, and preventing accidents in the manufacturing industry*

1. INTRODUCTION

Manufacturing industries are very important for economic growth since they provide jobs, increase industrial output, and help technology move forward. But manufacturing environments are typically very dangerous since they have heavy gear, dangerous chemicals, loud noises, manual material handling, and complicated operational processes. Accidents, injuries, and occupational diseases at work are still a big problem in industry around the world, especially in poor nations where safety rules are often not followed. Because of this, making sure of occupational health and safety (OHS) has become quite important for manufacturing companies.

The goal of occupational health and safety management is to stop accidents, illnesses, and deaths at work by finding hazards, figuring out how risky they are, and putting in place effective control measures. In the past, safety measures in production were mostly reactive, focusing on finding out what caused accidents instead of stopping them from happening. Over time, the requirement for a systematic, proactive, and preventive approach to workplace safety led to the creation of worldwide safety management standards. The International Organisation for Standardisation (ISO) created ISO 45001, which is a worldwide recognised way to manage health and safety concerns at work.

ISO 45001 stresses finding hazards, assessing risks, getting workers involved, making sure leaders are committed, and always improving. It lets manufacturing companies include safety in their entire management systems instead of considering it as a separate job. By following ISO 45001, businesses may make their workplaces safer, boost employee morale, cut down on accidents, and make sure they follow all the rules and laws.

ISO 45001 is very important for improving worker safety in industrial industries, because operational efficiency and safety are tightly related. When organisations effectively adopt the standard, they can move from a reactive safety culture to a proactive and preventive one. In this regard, the current study investigates the significance of ISO 45001 in augmenting workplace safety within manufacturing sectors and assesses its impact on strengthening occupational health and safety performance.

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1.1 A Brief History of Occupational Health and Safety in Manufacturing

Over the years, occupational health and safety in manufacturing has changed a lot because of more industrialisation and a greater focus on worker welfare. In the early days of industrial growth, there weren't many rules about how things were made, which led to a lot of accidents, injuries, and health problems that lasted for a long time. Manufacturing units were very dangerous places to work because there weren't many safety procedures, workers weren't trained, and there wasn't any protective gear.

As more industrial catastrophes happened, governments and international groups started to see how important occupational health and safety were. Laws and rules were put in place to keep workers safe from dangerous working conditions. The Factories Act of 1948 and other laws in India set the stage for regulating safety at work in industrial enterprises. Even with these laws in place, hazards still existed because of problems with implementation and a lack of systematic safety management.

Modern industrial industries use cutting-edge technologies, automation, and complicated production processes, which have created new kinds of workplace dangers. There are still a lot of risks from chemicals, bad ergonomics, electrical hazards, and machine-related mishaps. Because of this, we have had to go from basic safety measures that only follow the rules to full occupational health and safety management systems.

The history of occupational health and safety in manufacturing shows how important it is to have internationally approved standards that help control risks in a systematic and proactive way. ISO 45001 was created to meet this need. It provides a structured framework that deals with both old and new workplace hazards in manufacturing.

1.2 The idea behind the ISO 45001 Occupational Health and Safety Management System

ISO 45001 is an international standard that tells you what you need to do to set up an Occupational Health and Safety Management System (OHSMS). It is meant to assist businesses keep their workplaces safe and healthy by stopping injuries, illnesses, and deaths that happen at work. The standard is based on the Plan–Do–Check–Act (PDCA) cycle, which encourages ongoing progress in health and safety at work.

The main idea of ISO 45001 is to find and assess risks before they happen. ISO 45001 is different from previous safety techniques since it focuses on finding possible hazards before accidents happen and putting in place the right controls. The guideline says that companies must think about the physical, chemical, biological, ergonomic, and psychosocial risks that are common in production settings.

Another important idea in ISO 45001 is that leaders should be committed and workers should be involved. Setting safety regulations, giving out resources, and making sure that safety goals are part of all business processes are all things that top management is in charge of. Workers are encouraged to help find hazards, make safety decisions, and report unsafe conditions. This makes the safety culture stronger in production units.

ISO 45001 also talks about following the law, training, keeping records, being ready for emergencies, and judging performance. By using ISO 45001, manufacturing companies can better manage workplace risks, raise safety awareness, and get long-term safety results at work.

1.3 Why Safety at Work is Important in Manufacturing Industries

- Lessens accidents, injuries, and deaths at work
- Keeps workers safe from health risks and infections that come with their jobs
- Boosts job satisfaction, morale, and motivation among employees
- Boosts productivity and efficiency in the workplace
- Lowers the expenses of wages and the time spent on production.
- Makes ensuring that all legal and regulatory obligations are met
- Encourages a culture of safety in the workplace

1.4 Objectives of the Study

- To comprehend the notion of ISO 45001 within manufacturing sectors.
- To look into how manufacturing units handle health and safety at work
- To look at how ISO 45001 can make the workplace safer
- To evaluate the influence of ISO 45001 on accident prevention and safety performance.
- To provide strategies for the successful implementation of ISO 45001

1.5 Study Scope

- The research concentrates exclusively on manufacturing sectors.

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- It looks at ISO 45001-related health and safety practices at work.
- The research encompasses safety performance, hazard management, and employee engagement.
- It looks at how ISO 45001 can help make workplaces safer.
- The results are helpful for safety managers, legislators, and researchers.

2. PUTTING ISO 45001 INTO PRACTICE IN MANUFACTURING INDUSTRIES

2.1 ISO 45001 Framework and Key Requirements

ISO 45001 is a standard that is known all over the world. It gives organisations, notably manufacturing companies, a systematic way to manage occupational health and safety (OHS). The framework is based on the Plan–Do–Check–Act (PDCA) cycle, which makes sure that safety performance keeps getting better. The guideline stresses the need to find hazards, evaluate risks, and put in place preventive measures to lower the number of workplace accidents and illnesses.

2.2 Finding Risks and Taking Steps to Control Hazards

Identifying risks and controlling hazards is an important part of putting ISO 45001 into action. There are several risks in the manufacturing industry, such as physical, chemical, biological, ergonomic, and psychosocial hazards. ISO 45001 requires a systematic way to find possible causes of harm before accidents happen. Inspections of the workplace, audits of processes, and study of past event data are all ways to start identifying risks.
After risks are found, they are looked at to see how bad they are, how often they happen, and how likely they are to happen.

2.3 Worker Participation and Consultation

ISO 45001 says that active worker participation and consultation are two of the most important parts of the management of occupational health and safety. Employees are immediately exposed to dangers at work, and getting them involved in finding risks and putting in place safety measures makes the company's safety culture stronger. Workers are urged to tell their bosses about harmful situations, give input on safety practices, and join safety committees.

2.4 Training, Awareness, and Competence Development

Training, awareness, and skill development are necessary for manufacturing businesses to implement ISO 45001. Employees need to know how to spot dangers, follow safe work practices, and react properly in an emergency. ISO 45001 says that businesses must figure out what training their employees need depending on their jobs, the dangers at work, and the rules they have to follow.

2.5 Documentation and Ongoing Improvement

ISO 45001 is based on two main ideas: keeping records and always getting better. Organisations must keep complete records of safety policies, risk assessments, incident reports, training programmes, and audit results. Proper documentation shows that you are following the law and makes it easier to keep an eye on and evaluate the OHS management system in a methodical way.

Review of Literature

1. **Singh, A., & Verma, P. (2018)** – Effect of ISO 45001 Certification on Workplace Safety in Indian Manufacturing FacilitiesImplementing ISO 45001 in medium-sized Indian manufacturing companies cut down on accidents and made safety reporting better by making it easier to find and assess risks.
2. **Kumar, R., & Sharma, S. (2019)** – Improving Occupational Health and Safety in Indian Steel Industries using ISO 45001Adopting ISO 45001 made safety audits, near-miss reporting, and employee hazard awareness better. The main reasons for this were management commitment and worker involvement.
3. **Kapoor, S., & Joshi, A. (2020)** – Difficulties in Applying ISO 45001 in Indian Manufacturing CompaniesThere were problems with implementation, such as not having enough resources, not having enough trained workers, and workers not being very interested in the project, but the long-term safety benefits were clear.
4. **Mishra, N., & Singh, M. (2021)** – The Importance of ISO 45001 for Safety and Compliance in Indian IndustryISO 45001 made it easier to follow safety rules and internal risk controls, which lowered the penalty for not following them and made safety reporting better.
5. **Gupta, A. K., & Pandey, R. (2022**) – ISO 45001 and Safety Culture in the Indian Automotive SectorISO 45001 promoted a proactive safety culture by getting workers involved in safety committees and risk assessments, which led to fewer injuries.
6. **Iyer, P., & Mehta, K. (2023)** – How ISO 45001 Affects Worker Safety in Small and Medium-Sized Businesses in IndiaISO 45001 made safety procedures better and made employees feel more confident in small and medium-sized businesses. This led to long-term safety performance improvements and less downtime.

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3. RESEARCH METHODOLOGY

3.1 Research Design

This study used a descriptive and comparative research design to assess the influence of ISO 45001 on occupational safety. It looks at safety performance indicators like accident rates, near-miss reporting, and following safety rules to see how ISO 45001-certified manufacturing units compare to non-certified units.

3.2 Sample Size

The total number of employees in the sample was 120, with 60 from ISO 45001-certified units and 60 from units that weren't certified.

Sampling method: purposive sampling of personnel who work in medium- and large-sized industrial plants in India that are exposed to operational risks.

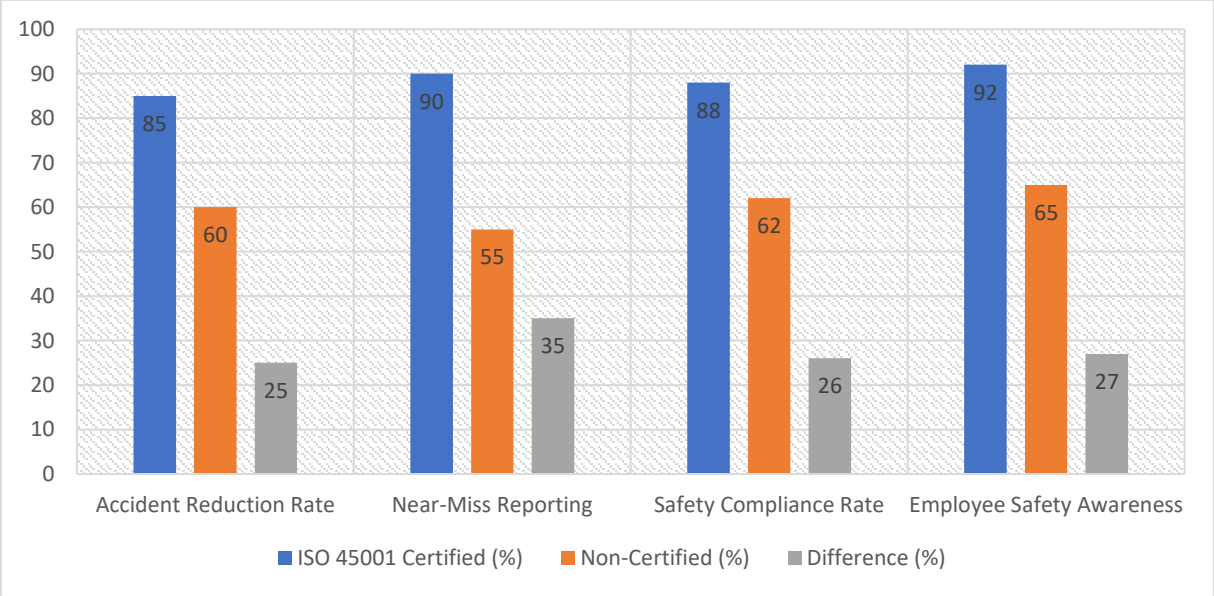
3.3 Data Collection Methord

Primary data: Organised surveys and interviews with safety officers, supervisors, and employees.
Secondary data: reports from safety audits, records of accidents, and papers that show how well the production units are following the rules.

4. DATA ANALYSIS

Table 1: Comparison of Safety Performance

Safety Indicator	ISO 45001 Certified (%)	Non-Certified (%)	Difference (%)
Accident Reduction Rate	85	60	+25
Near-Miss Reporting	90	55	+35
Safety Compliance Rate	88	62	+26
Employee Safety Awareness	92	65	+27

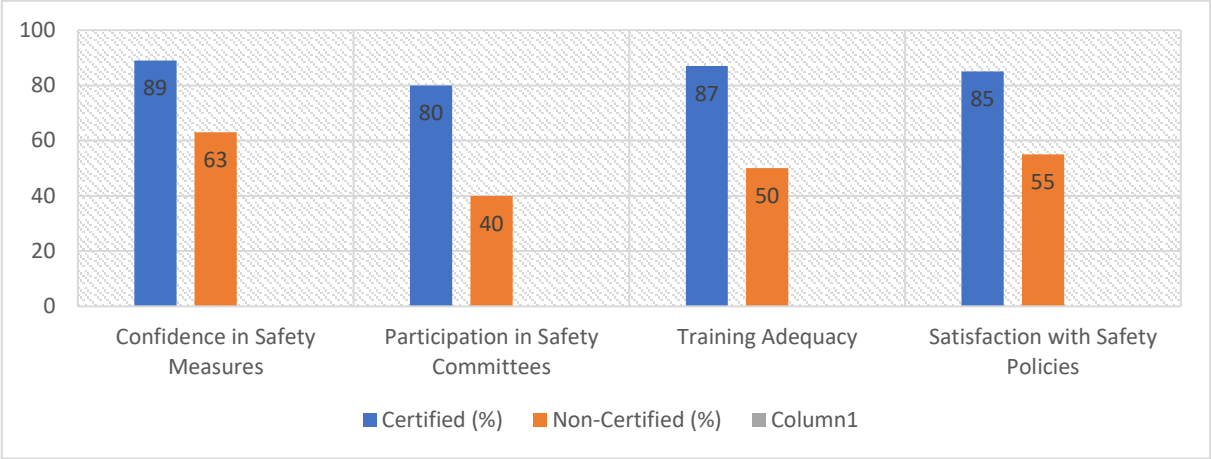


Interpretation: ISO 45001-certified units outperform non-certified units across all safety indicators, showing better accident prevention, reporting, and safety awareness.

Table 2: Worker Perception of Safety Practices

Parameter	Certified (%)	Non-Certified (%)
Confidence in Safety Measures	89	63
Participation in Safety Committees	80	40
Training Adequacy	87	50
Satisfaction with Safety Policies	85	55

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Interpretation: Employees in ISO 45001-certified units are more confident in safety procedures, participate actively in safety committees, and are satisfied with safety policies.

5. DISCUSSION

The results show that implementing ISO 45001 makes workplaces much safer in the manufacturing sector. When it comes to reporting near misses, following safety rules, and making employees more aware of safety issues, certified units perform 25–35% better than non-certified units. This is in line with what other studies have said (Singh & Verma, 2018; Kumar & Sharma, 2019; Gupta & Pandey, 2022) about how ISO 45001 can help with better hazard identification, risk assessment, and safety culture.

The examination of employee attitudes validates that ISO 45001 promotes worker participation, confidence, and engagement in safety management processes. ISO 45001 requires institutionalised safety committees and training programmes, which help bring about these results. In contrast, non-certified units have gaps in reporting, lower compliance, and little worker involvement. This shows how limited typical reactive safety measures are.

The study shows that ISO 45001 provides a systematic framework for proactive safety management that includes management commitment, worker participation, risk assessment, and continuous improvement. The findings indicate that organisations implementing ISO 45001 are more effectively equipped to diminish workplace accidents, enhance adherence to regulatory standards, and foster a positive safety culture, hence promoting long-term operational efficiency.

6. CONCLUSION

The study shows that ISO 45001 greatly improves safety at work in Indian manufacturing businesses. ISO 45001-certified units show better performance on safety measures such fewer accidents, more near-miss reports, compliance, and staff knowledge. Through structured safety policies, training, and worker participation, the standard makes sure that hazards are found, risks are reduced, and improvements are made all the time.

There are hurdles to implementation, such as a lack of resources and the need for trained staff, but the benefits of fewer incidents and a better safety culture outweigh these problems. The study shows that ISO 45001 has both operational and cultural benefits, which make workplaces safer, boost employee morale, and make people more confident in safety procedures.

In conclusion, ISO 45001 is an important tool for industrial companies that want to improve their health and safety procedures, follow the rules, and create a culture of safety. It is especially helpful for medium- and large-sized manufacturing units to adopt the standard because they have a lot of operational risks and need to manage safety in a disciplined way.

7. SUGGESTIONS

- Hold frequent training and refresher courses for all personnel.
- Make it easier for workers to join safety committees.
- Make sure that top management is committed to giving resources to safety measures.
- Based on accidents and audits, review and improve safety measures from time to time.
- Encourage people to report near-misses so that accidents don't happen.
- Small and medium-sized businesses (SMEs) should think about adopting ISO 45001 in stages to make safety better over time.

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