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Original

Effect of Integrated Management System on Occupational Hazards Reduction

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Abstract

Background: Today, organizations need to comply with environmental standards, employees, customers, and others in order to achieve competitive advantage and performance globally. One of these standards is an integrated management system. One of the standards in an integrated management system is safety and health that is currently being considered as one of the most important worldwide issues, and emphasizes the goals of identifying harmful factors, evaluating, controlling, and managing. This study tries to measure the efficiency of an integrated management system by analyzing the annual report of work place damage before and after implementing this system. **Methods:** This descriptive-analytic study was carried out in one of tile factories from 2009 to 2014 in Yazd. The data on the measurement of occupational harmful factors (sound, lighting, thermal stress, total dust) during the years of the study were collected and analyzed by the SPSS software version 19.**Results:** According to the results of measuring the harmful factors of the work place in this research, the establishment of an integrated management system on the environmental factors (sound, lighting, thermal stress and total dust) in the studied industry environment was positive and reduced issues out of standard and increased standard stations. **Conclusion:** The integrated management system establishment had positive effects on physical and chemical environmental factors and reduces costs, eliminates performance and ultimately improves the performance and efficiency.

Keywords: Harmful factors; Integrated management system; Standard

Introduction

Organizations are interested in proving the proper functioning of occupational safety and health through the control of occupational safety and health risks which are in line with their health and safety objectives and occupational health.[1] They do this in a framework of rules that are tightening over time.[2-5] The International Organization for Standardization (ISO) is responsible for developing standards. This activity started with the ISO 9000 quality system in 1987.[6] In 1996, environmental management systems were published by the ISO International Standard

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ISO 14001: 1996. [6,7] The structure of this management system was based on the popular theory of Deming Cycle (PDCA, Plan, Do, Check, Action).[8,9] In 1999, the British Standards Institution released the first version of the OHSAS 18001 based on the BS 8800. This standard continued with the OHSAS 18001: 2004 and OHSAS 18001: 2007. [8,10] SO is currently developing a new ISO 45001 standard for occupational safety and health management systems - requirements that will help organizations to create a framework for improving employee safety, reducing workplace hazards, and creating better and safer working conditions around the world. This standard has already been developed by the Professional Health and Safety Expert Committee and will follow other public management systems such as ISO 14001 and ISO 9001. This standard also includes other international standards in this area, such as OHSAS 18001, ILO-OSH guidelines, national standards, and international labor standards.[11] It is proved that safety, health, environment, and quality are not separated. However, most companies have also found that the separate use of OHSAS 18001 and ISO 14001 result in low efficiency and high costs.[12,13] Different organizations with the establishment of integrated systems assess the above issues.[14] The IMS Integrated Systems are in fact based on the three ISO 9000 Quality Management Standards; OHSAS 18001 Health , Safety Management and ISO 14000 Environmental Management in order to achieve a comprehensive management system. [8] The IMS Integrated Management System has developed a model for concurrent auditing based on the standards of the above three systems.[15] Integrated management systems can provide a significant opportunity for organizations to improve and comply with international standards.[16] Compliance with these professional standards leads to the credibility and good reputation of the institutions and represents the degree of corporate responsibility. [17-20] One of the suitable solutions to promote the level of health factors affecting the increase of the health and satisfaction of human resources and the elimination of environmental controversies is the establishment of occupational safety and health systems and environment. [21-23] To identify and assess the risk of harmful factors in the work place, it is necessary to measure the parameters of the harmful factors. Goggier, Jacquard, Corkovey and Bastida have studied the effects of environmental standards on physical factors. [4,23-25] This research evaluates the health status of one of the tile industries in Yazd before and after the establishment of an integrated management system based on the information extracted from the results of measurement of health and environmental factors.

Methods

This descriptive-analytic study was conducted in 2014 at all units of a tile factory in Yazd. Data are collected based on the results of the measurement of occupational safety and health contaminants related to 2009 and 2010 (years before the implementation of the integrated management system) and 2011 to 2014 (years of implementation of Integrated management system). In order to collect data before and after the establishment of the IMS, a form was used to record occupational harmful factors, chemical factors and air pollutants. The researchers, while referring to the documentation of the measurements, extracted the required data and recorded them in the data collection form. The survey data includes the percentage of all stations measured in terms of sound, lighting, dust and thermal stress during these few years. The Trusted Companies of the Ministry of Health used sound meter (SLM), lux meter (LUX METER), sampling pump and WBGT to measure the harmful effects of sound, lighting, dust and thermal stress. Before each measurement, they calibrated the devices.

According to the standard, the ACGIH value is 85 dB, 200 lux, 10/10 mg / m3 for sound, light, and dust, respectively and WBGT for easy, average and hard jobs are 31, 29 and 27.5 ° C, respectively.[26] Finally, this information was analyzed using the SPSS software version 19 (paired t-test).

Results

The results of the comparison of the measurement of occupational harmful factors such as sound, lighting, dust and thermal stress are shown in diagram 1 to 4. Diagram 1 shows the number of stations that have sound over the limits (85 dB).[27]

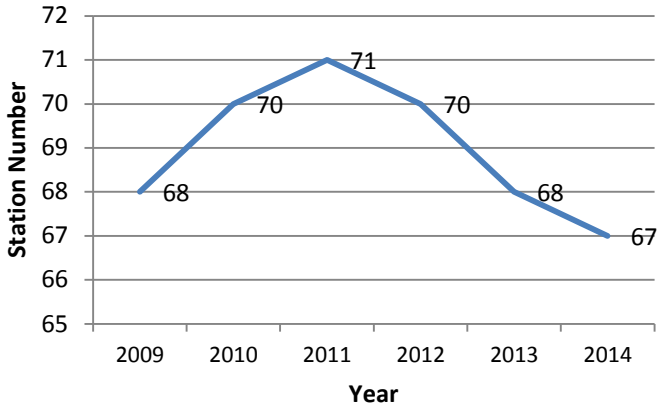

Figure 1. The number of stations with sound over the limits

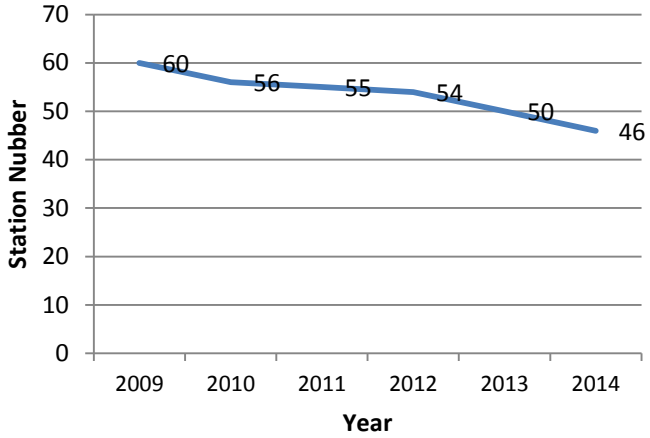

Figure 2. The number of stations with lightening over the limits

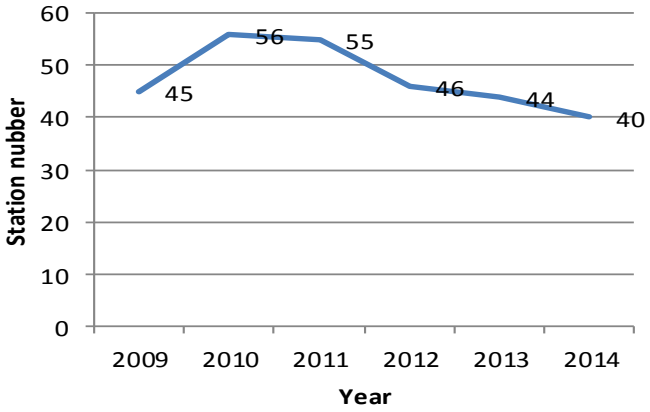

Figure 3. The number of station with thermal stress over the limits

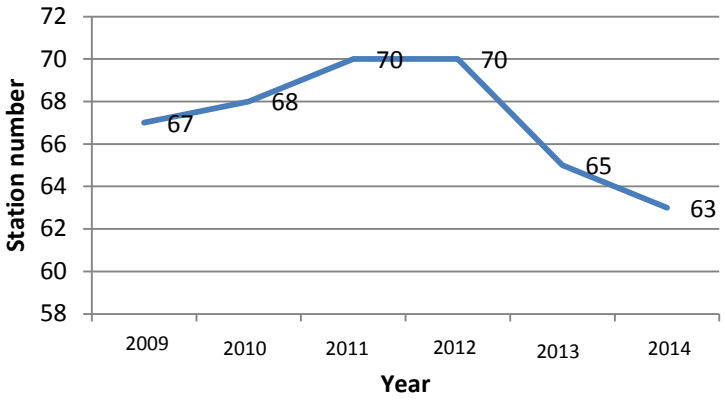

Figure 4. Number of stations with total dust over the limits

By comparing the results of sound measurements before and after the establishment of the integrated management system with using the paired T-test, after the establishment of the integrated management system, there was a significant reduction in the number of stations with sound over the limits (*P* value <0.05).

Diagram 2 shows the number of stations with lower brightness over the limits. The results of light measurements between 2009 and 2014 indicate a gradual decrease in the number of stations with lower brightness over the limits. [27]

By comparing the results of light measurements before and after installing the integrated management system with using the paired T-test, there was a significant reduction in the number of unauthorized stations after the establishment of the integrated management system (*P* value <0.05). Diagram 3 represents the number of stations that have a higher thermal stress over the limits.[27]

By comparing the results of WBGT measurements before and after the establishment of an integrated management system with using the paired T-test, it shows that after the establishment of the integrated management system, there was a significant decrease in the number of stations (*P* value <0.05). Diagram 4 illustrates the number of stations that have dust over the limits.

By comparing the results of total dust measurements before and after the establishment of the integrated management system with using the paired T test, it can be found that after The establishment of an integrated management system there was a significant reduction in the number stations with dust over the limits (*P* value <0.05).

Discussion

By analyzing and comparing the results of measurement of occupational pollutants before and after the establishment of an integrated management system, the establishment of this system has had a positive effect on the harmful factors of the work place. The sound results show that after the establishment of the integrated system of management, the number of stations with sound over the limits have been reduced by a fast slope. The results of this study coincided with the findings of Zabaly's research.[1]

The increase in the number of standard stations in terms of lighting intensity after establishing an integrated management system is due to actions such as making lighting in the ceiling of the halls, increasing the number of common lighting lamps in low light sections and using local lighting. After the establishment of the system, the brightness results are consistent with the study of Zaboly.[1] Between 2009 and 2012, there has been an increase in the number of stations that have dust levels over the limits. This increase has been due to increased

production lines and reduced efficiency of these lines. In 2013, the number of stations with dust over the limits decreased significantly. The reason of this design is implementation and installation of cyclone dampers at the beginning of 2013 at the crusher hall, glazing, press and body halls, which absorb and collect a large portion of dust particles. The Bag house system was also installed in Chamfering. The findings of Chen et al., Vent Garrett et al., Wider and Zabaly, were consistent with the findings of the present study on the control of chemical factors.[1,18,29]

In assessing the impact of standards implementation in Mexico, Chiaryini, it was concluded that the establishment of standards due to constant measurement and monitoring would improve the performance of physical and chemical control. Several studies also demonstrated the positive effects of implementing an integrated management system on the physical and chemical factors of the work place.[1,3,23-25] According to the results of environmental factors measurement in this study, establishing the integrated management system, environmental standards and occupational health and safety on environmental factors (sound, lighting, thermal stress and dust) in the studied industrial environment have a positive result, reduce the number of items outside the standard and increase the number of stations in the standard limits. In investiging the effect of establishment of safety and health management standards and environmental management standards on environmental factors and employee satisfaction in Milad industrial complex, Mr. Zaboli concluded that with the establishment of occupational safety and health management systems, environmental factors are controlled in the organization, and with the improving environmental conditions, employees' satisfaction has increased and organizational and individual performances are improved.[1] Establishment of an integrated management system has had a positive effect on the physical and chemical factors of the environment, and has improved these factors. Among the limitations of this study, the authors were able to to mention the issues related to process change and equipment upgrading, increasing the skills and expertise of individuals that can be considered in future research studies.

Conflict of interest

There is no conflict of interest between authors.

Acknowledgment

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