

## ASSESSING MANAGEMENT INVOLVEMENT IN SAFETY ISSUES: THE CASE OF THE METAL PRODUCTS INDUSTRY IN IRAN

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### ABSTRACT

*The concept of management involvement in safety refers to the extent to which top- and middle-level managers become personally involved in critical safety activities within the organisation. Occupational accidents and incidents are symptoms of low management involvement in safety issues because most accidents could be prevented. The main objectives of this study were to evaluate management involvement in safety issues (such as safety values, occupational safety management, and employee well-being) and to analyse differences in management involvement in the metal products industry in Guilan Province, Iran, with regard to company size. A total of 714 respondents from 14 companies participated in the survey. The results showed that management involvement in safety issues was not strong in the metal products industry in Guilan Province. A one-way ANOVA analysis was applied to understand employees' perspectives on management involvement in safety. The results revealed that there was a significant difference regarding management involvement in safety with respect to company size. Large companies had stronger management involvement in safety compared to smaller companies.*

**Keywords:** management involvement in safety, company size, metal products industry, Iran

### INTRODUCTION

Management involvement in safety issues is contingent on management's physical approach to safety (Lawrie, Parker, & Hudson, 2006). For instance, there is direct involvement of the upper- and middle-level management in safety meetings or in safety oversight (Short, Boyle, Shackelford, Inderbitzen, & Bergoffen, 2007), including training, career development, and professional growth. Management involvement refers to the extent to which both upper- and middle-level managers become personally involved in critical safety activities within the company. Furthermore, management involvement in safety refers to managers' effective presence and contribution to safety training through seminars

and workshops, to their active oversight of safety critical operations, to their ability to keep up with the risks involved in daily operations, and to the extent to which there is good communication about safety issues, both up and down the organisational hierarchy (Wiegmann, Zhang, Thaden, Sharma, & Mitchell, 2002). The upper- and middle-level management, through participation in daily operations, communicate to their employees an attitude of concern for safety that subsequently influences the degree to which employees comply with operating rules and safe operating practices.

However, while the top management defines organisational safety goals and undoubtedly plays an important role in communicating organisational values related to safety, the role of first-line supervisors is also critical. First-line supervisors act as a conduit between senior management and the workforce and play an important role in shaping workers' understanding of what is expected of them by communicating the priority of safety in the workgroup. First-line supervisors also monitor compliance with management directives and provide important feedback to workers concerning the appropriateness of their behaviour. Supervisors' behaviours and expressions of opinions have a considerable influence on the development of workers' beliefs about management policies and priorities (Lingard, Blismas, & Wakefield, 2005). Therefore, management creates and controls the situation in which occupational accidents and incidents occur in industries.

Safety issues that we are addressing here are related to measuring the maturity of organisations' safety values, the occupational safety management (system), and employees' well-being. A strategic action plan to integrate safety is the first element of strong safety values that aim to integrate safety into all activities in companies (Fulwiler, 2000; Molenaar, Brown, Caile, & Smith, 2002). There should be a written form that includes specific strategies, action plans, timelines, and owners. A company's safety management system, the major element and foundation of a strong and positive safety environment, should also include a high-quality safety management information systems. The safety management information systems provides the means by which companies can evaluate their ongoing safety activities (International Atomic Energy Agency [IAEA], 2002). A safety information system collects, analyses, and disseminates information from accidents, incidents, and near misses, as well as from regular proactive system checks (Parker, Lawrie, & Hudson, 2006). In fact, the extent to which companies provide the necessary resources to address the findings of the audits about processes or the safety management system also indicates whether there is a basic foundation for safety (IAEA, 2002). A strong and positive safety situation refers to the extent to which every employee receives integrated job and safety training. Exposing employees to infrequent safety lectures in classrooms is insufficient (IAEA, 2002). Training and human resources capabilities allow employees to

succeed. In addition, training programs are needed to develop employees' safety knowledge and capabilities (Fulwiler, 2000). There is a number of other employee well-being issues that a company can support, including career development and professional growth; respect for employee rights, such as freedom of communication and association; promotion of balance between commitment to work and personal or family life; promotion of diversity; and prohibition of discrimination and harassment. Such measures will contribute to employee productivity and safety consciousness, as well as loyalty and pride (World Business Council for Sustainable Development, 2004).

Management involvement measures the extent to which management acknowledges the significance of a safety program and becomes involved in the safety process (Danielsson & Stubbs, 2000; Molenaar et al., 2002; Ray & Bishop, 1995). Managers' participation positively influences employees' behaviour by developing a sense of participation and ownership of a safety program. Ray and Bishop (1995) argued that the integration of safety as a function of managing employees is necessary to develop an effective safety programme. Dingsdag, Biggs, Sheahan and Cipolla (2006) revealed that the involvement of the upper-level management in various safety activities provides managers with opportunities for feedback and self-reflection regarding safety outcomes. Erickson (2000) believes that the values of the upper-level management represent organisational standards that influence almost all aspects of the work setting such as appropriate protocols for companies. These protocols include organisational standards of desired ends and preferred actions to attain these end points. For instance, employees' safety may be one of the important objectives, and to achieve this end point, safety is emphasised. These values are actually references that indicate the rightness of certain beliefs and practices over others. These values are manifested in management's actions and behaviours, reflected by what management does, pays attention to, ignores, measures, and controls. Therefore, management involvement in safety is the most important factor to achieve a satisfactory safety level by preventing accidents (Danielsson & Stubbs, 2000; Mohamed, 2003; Burgess, 2008; Bull, Riise, & Moen, 2002). Management involvement is important in achieving successful safety performance (Xiaoyong & Waendi, 2012; Chiocha, Smallwood & Emuze, 2011). One of the strongest barriers to effective management involvement in safety is the reluctance to accept safety as an important performance criterion (Bohle & Quinlan, 2000). Sawacha, Naoum and Fong (1999) mentioned that those variables that require management involvement such as safety policy, relationship with employees, safety representative, and talks about safety are all found to be linked to safety performance. Some studies agreed on the impact that management involvement has on the success of any safety performance scheme covered by the managers' perceptions on safety performance.

Participative management incorporates a number of interrelated activities, the most critical being management involvement in work and safety activities as well as frequent, informal communication between management and employees. These interactions serve a number of useful functions that demonstrate managers' safety concerns. These interactions serve as a frame of reference for employees to guide appropriate behaviours, and they foster closer ties between managers and employees. More recent evidence (O'Dea & Flin, 2001) suggests that not only management participation and involvement in safety activities but also the extent to which management encourages the involvement of employees is important. Moreover, management must be willing to devolve some decision-making power to the employees by allowing them to become actively involved in developing safety interventions and safety policies rather than simply playing the more passive role of recipients. As such, employees are more likely to take ownership and responsibility for safety.

Occupational injuries are still among the predicaments that exact a great toll on employees and their employers in Iran. The importance of the problem is well known in most developed countries; however, in developing countries, to which the target population group of this study belongs, less attention has been paid to this problem. Iran, as a developing country with a high capacity of resources, still needs strong safety values, effective safety management systems to guarantee a safe workplace, and increased safety for professional and skilled human resources to join the developed countries. Mohammadfam and Sadri (2000) found that to address the problem of occupational accidents, traditional accident investigation techniques, which were applied after an accident occurred, have been replaced with more preventive techniques. Furthermore, to achieve the stated objectives of alleviating occupational accidents, some strict new laws have been approved. Additionally, according to statistical documents (Mohammadfam & Sadri, 2000), in recent years, the nature of accidents has changed. Companies are using new and modern technology, which reduced the frequency of accidents. However, some evidence (Ooshaksaraie, 2009) indicates that the consequences of accidents are more severe now. Most companies are still using traditional methods and outdated technologies. Thus, the frequency of accidents with permanent injuries is high. In the case of Iran, traditional methods and technologies are still in use, and the frequency of accidents is still high.

In general, most industrial companies in Iran comply with established occupational safety procedures and policies; however, the numbers of occupational injuries in industries have steadily increased in recent years. However, most accidents and incidents in Iranian industries are a direct result of not adhering to established safety procedures as well as of weak management involvement in safety, safe working conditions, and employees' work safety attitudes and actions. Thus, the participation of all employees including managers

and non-managers is vital in policymaking and in establishing and implementing a feedback system that drives continuous safety improvements in industrial companies to achieve a successful safety program. It must be mentioned that management involvement in safety plays an important role in reducing occupational accidents in the industry. The current situation of safety in the metal products industry shows that there is room for the management to improve safety through the implementation of safety procedures. To date, no studies have been conducted on management involvement in safety in the metal products industry in Iran (Guilan Province). Therefore, the main objective of this study was to evaluate management involvement in safety in this industry based on employees' perceptions. Furthermore, this study analysed differences in management involvement in the metal products industry in Guilan Province, Iran, with regard to company size.

## **RESEARCH METHODS**

A total of 14 companies in the metal products industry in Guilan Province in Iran participated in the questionnaire surveys. Of these 14, two companies had 10–49 employees (small-size companies), five companies had 50–99 employees (medium-size companies), and seven companies had 100 employees and more (large-size companies). According to the Ministry of Industry, Mine and Commerce (2004), companies with 10 employees and more are categorised into three distinguished groups: companies that have 10–49 employees (small companies), companies that have 50–99 employees (medium companies), and companies that have 100 employees and more (large companies). It must be mentioned that companies with fewer than 10 employees were not included in this study. The metal products industry was selected because of the high occupational injury rate amongst the industries in Iran (approximately 35 injuries per 1,000 workers). The population of the target group consisted of managers and non-managers. A random sampling method is used to define the target population. A total of 714 respondents from 14 companies participated in the survey, which yielded an overall response rate of 84.80%.

This study used a quantitative and descriptive methodology to collect and statistically analyse data. Data collection was concluded through questionnaire surveys, using a five-point Likert scale. The questionnaires were designed to capture respondents' perceptions of management involvement in safety in the metal products industry in Iran (Guilan Province) through seven items. The questionnaire on management involvement in safety in this study was based on the development and initial validation of a safety culture survey of Wiegmann, Thaden, Mitchel, Sharma and Zhang (2003), a standard questionnaire that was modified for the purpose of this study. The questionnaire was aimed at evaluating

management involvement in safety considering the following seven items; high priority of management involvement in safety issues, keeping track of minor and major safety problems, having a clear picture of the risks associated with work operations, assigning high priority to safety issues in meetings, stopping unsafe operations or activities by the management, keeping employees informed about any changes that may affect safety, and having good communications about safety. Cronbach's alpha coefficient was used to test and determine the reliability of the survey instrument in this study.

The data collection for the quantitative method was based on the hypothesis regarding the differences in management involvement in safety in the metal products industry in Iran (Guilan Province) with regard to company size. Hence, to investigate differences in management involvement in safety in the metal products industry, a one-way ANOVA analysis was conducted. The total score of management involvement in safety in terms of employees' perception was analysed and used to test the hypothesis of this study. A significance level of 0.1 ( $p$ -value) was used to establish the difference between the variables. The smaller  $p$ -value indicates higher estimation certainty and vice versa for a higher  $p$ -value.

Performance scores of items of management involvement in safety were calculated to evaluate the safety performance in terms of employees' perspective. Performance scores of management involvement in safety were determined by calculating the mean of participants' responses for each item. The mean score of management involvement in safety indicates respondents' general opinion. A mean score below three indicates that respondents generally held a negative opinion about management involvement in safety in their companies. This score indicates that in the opinion of employees, management involvement in safety was not strong. In contrast, a mean score of management involvement in safety of three or higher indicated that respondents generally held a positive view of management involvement in safety in their companies. This score indicates that in the opinion of employees, management involvement in safety was strong.

## **RESULTS**

The internal consistency reliability coefficients (Cronbach's alpha) were computed for a standard questionnaire on management involvement in safety, which was modified for the purpose of this study. To compute Cronbach's alpha, 30 completed questionnaire surveys from a pilot group were used. The questionnaire results indicated a reliability of 88% in Cronbach's alpha; therefore, the instrument can be considered very reliable. Table 1 indicates that Cronbach's alpha coefficient was 0.88 for the management involvement in the safety questionnaires.

In this study, management involvement in safety is analysed in terms of respondent's perception by scoring each item.

Table 1  
*Cronbach's alpha coefficients of the survey instrument*

Survey instruments	Items number	Samples number	Cronbach's alpha
Management involvement in safety	5	30	0.88

Table 2 shows the average scores of management involvement in safety based on company size. The results show that the mean of the average scores of management involvement in safety with regard to company size was  $2.12 \pm 0.76$ ,  $2.32 \pm 0.72$ , and  $2.66 \pm 0.89$  for small, medium, and large companies, respectively, compared to the possible maximum score of 5. Because the mean score of management involvement in safety was less than 3 for both cases, this result indicates that management involvement in safety issues was not strong for any company size. The overall result shows that the mean of the average scores of management involvement in safety was  $2.53 \pm 0.85$  in the metal products industry compared to the possible maximum score of 5. A mean score of management involvement in safety of less than 3 indicates that management involvement in safety issues was not strong in the metal products industry in Guilan Province, Iran.

Table 2  
*Average score of management involvement in safety based on company size*

Company	Management involvement in safety average score	Lowest obtained	Highest obtained	Mean	S.D.
Size	Small	1.00	4.40	2.12	0.76
	Medium	1.30	4.40	2.32	0.72
	Large	1.00	5.00	2.66	0.89
Overall		1.00	5.00	2.53	0.85

The results in Table 3 provide details of respondents' perspective regarding items of management involvement in safety based on company size. The results show that of the respondents from small, medium, and large companies, a majority of 80.60% (28.57% + 52.03%), 75.31% (18.67% + 56.64%), and 60.02% (19.51% + 40.51%), respectively, gave low ratings for items 1 to 7. Most respondents stated the following:

1. Management involvement in safety issues has no high priority in their company.
2. Their company does not keep track of minor and major safety problems.

3. Management in their company does not have a clear view of the risks associated with work operations.
4. Safety issues are not assigned high priority in meetings in their company.
5. Management in their company does not stop unsafe operations or activities.
6. Employees are not kept informed about any changes that may affect safety in their company.
7. There are no good communications about safety in their company.

A minority of 40.04% of respondents in small, medium, and large companies (1.84% + 31.30% + 6.90%, respectively) gave high ratings for items 1 to 7. The overall result reveals that 65.34% (19.77% + 45.57%) of respondents in the metal products industry gave low ratings for items 1 to 7 compared to 34.67% (1.61% + 27.70% + 5.36%) who gave high ratings.

In this study, the results obtained are analysed for any differences in management involvement in safety in the metal products industry in Iran (Guilan Province) with respect to company size. The hypothesis is as follows: There are differences in management involvement in safety in the metal products industry in Iran (Guilan Province) with respect to company size.

Table 4 shows the result of a variance analysis for differences in management involvement in safety in the metal products industry with respect to company size. Because the Sig. (*p*-value) is less than 0.01, there is a significant difference in management involvement in safety in the metal products industry at a 99% confidence level.

Table 5 shows the results of a comparison of management involvement in safety in small, medium and large companies using the Duncan Post Hoc Test. This analysis shows that there is a difference in management involvement in safety between large companies compared to small and medium companies. However, there is no difference in management involvement in safety between small companies compared to medium companies. This result is in line with Kinner and Gray (2008), according to whom there are no differences among the means of each group and each member of either group is different from a member of the other group. Furthermore, the result shows that large companies had the strongest management involvement in safety, while small companies had the weakest management involvement in safety in the metal products industry in Iran (Guilan Province).

Table 3  
*Percentage of management involvement in safety items based on company size*

No. Items		1	2	3	4	5	6	7	Average
Company		Percentage							
1	Small	30.8	23.1	38.5	25.6	17.9	25.6	38.5	28.57
	Size Medium	18.9	13.3	21.9	14.8	13.8	20.4	27.6	18.67
	Large	19.0	18.4	17.7	21.1	14.6	20.3	25.5	19.51
	Overall	19.6	17.2	20.0	19.6	14.6	20.6	26.8	19.77
2	Small	51.3	48.7	46.2	59.0	59.0	56.4	43.6	52.03
	Size Medium	53.1	62.2	54.1	65.3	51.5	57.7	52.6	56.64
	Large	37.0	46.8	38.0	43.6	33.8	44.7	39.7	40.51
	Overall	42.2	51.1	42.9	50.4	40.1	48.9	43.4	45.57
Scales 3	Small	0.0	0.0	0.0	0.0	2.6	2.6	0.0	0.74
	Size Medium	1.0	1.0	1.0	0.5	1.5	2.6	1.0	1.23
	Large	1.5	1.5	1.9	1.7	1.3	2.9	2.1	1.84
	Overall	1.3	1.3	1.5	1.3	1.4	2.8	1.7	1.61
4	Small	15.4	23.1	15.4	12.8	15.4	10.3	15.4	15.40
	Size Medium	25.0	20.9	22.4	16.8	31.1	17.9	15.8	21.41
	Large	33.0	25.1	37.0	28.2	41.8	27.3	26.7	31.30
	Overall	29.8	23.8	31.8	24.2	37.4	23.8	23.1	27.70
5	Small	2.6	5.1	0.0	2.6	5.1	5.1	2.6	3.30
	Size Medium	2.0	2.6	0.5	2.6	2.0	1.5	3.1	2.04
	Large	9.6	8.4	5.4	5.4	8.6	4.8	6.1	6.90
	Overall	7.1	6.6	3.8	4.5	6.6	3.9	5.0	5.36

Average: Average percentage of management involvement in safety for 7 items by scale

**DISCUSSION**

The findings of this study indicate that from the perspective of the respondents, management involvement in safety issues was not strong and needs to be improved to continuously improve safety in the metal products industry in Guilan Province, Iran. Most respondents felt that to strengthen management involvement in safety in the metal products industry, the following aspects must be considered: a high priority of management involvement in safety issues, keeping track of minor and major safety problems, having a clear picture of the risks associated with work operations, assigning high priority to safety issues in

meetings, stopping unsafe operations or activities by the management, keeping employees informed about any changes that may affect safety, and having good communications about safety. It must be mentioned that the findings of this study are not in line with a study by Wiegmann et al. (2003) that reported a mean value of 5.19 (using a seven-point Likert scale) for management involvement in safety within the commercial aviation industry in the United States. Furthermore, the finding of this study is not in line with a study by Pyoos (2008) that reported a mean value of 3.62 (using a five-point Likert scale) for management involvement in safety within a South African thermal coal mining operation. Furthermore, the finding of this study is in disagreement with a study by Ojo (2010) in which a majority of the respondents (almost 95%) agreed that the level of management involvement is good within the Seychelles Construction Industry in Nigeria. Because the safety culture in the target population group is still in its infancy in the Guilan Province region, some respondents agree that management seeks to be involved in safety; most of respondents (the lower-scoring items) suggested that the communication necessary to make that involvement effective might not be in place. The expected results for the management involvement items also indicated that an effective two-way communication between employees and managers may not be feasible.

The findings of this study show that there are significant differences in management involvement in safety in the metal products industry with respect to company size. The comparison results show that large and small companies, respectively, had the strongest and weakest management involvement in safety in the metal products industry in Iran (Guilan Province). The company size does have an influence on how top management translates its commitment to safety into practice, and this impact can be quite favourable in work settings. The company size will significantly influence management involvement in safety issues. In addition, the company size will significantly influence the amount of top managers' direct contact with their employees, especially the workers. On the one hand, in a small company, the owner might actually be a fellow worker, perhaps functioning as a controller. The owner will establish the project's safety culture. If safety is no major concern for the owner, the workers will quickly understand this fact. If safety is of vital importance, the workers will also realise this fact. The owner will be in a position to directly translate his/her personal philosophy into practice. In contrast, in a large-size company, top management involvement occurs in a quite different situation. Therefore, because of structural formalisations, the top management has a high impact on the establishment of each project's safety culture. The top management constantly sends messages to the field; some of these messages are formal communications, whereas other messages may merely be subtle hints. If the commitment is strong enough, the field personnel will have no doubts about the top management's safety stance.

## **CONCLUSION**

High management involvement in safety issues is recommended to improve safety in all Iranian industries. Among these industries, the metal products industry is a pioneer in consistently advancing national standards to improve safety capabilities in the workplace. Identifying the need to improve safety in this industry will lead managers to be effectively involved in safety issues. Because safety in industrial operations is related to employees' safety, managers must try to change employees' safety behaviours through increased involvement in safety issues. While industrial safety is improving, it is still far from best practices, and many Iranians are being injured and killed every year at work.

The statistical analyses showed the evaluation of management involvement in safety issues in the metal products industry in the target population group. The findings showed that from employees' perspective, management involvement in safety issues was not strong in the metal products industry in Iran (Guilan Province). Furthermore, most respondents gave low ratings on all items of management involvement in safety issues in the questionnaire. This result indicates that in the opinion of employees, effective management involvement in safety issues requires the following: management involvement in safety issues should have a high priority; the company should keep track of minor and major safety problems; management should have a clear view of the risks associated with work operations; safety issues should be assigned high priority in meetings; management should stop unsafe operations or activities; employees should be kept informed about any changes that may affect the safety in their company; and the company should have good communications about safety.

The comparison of management involvement in safety issues in the metal products industry revealed differences between small, medium, and large companies. The results showed that large companies had the strongest management involvement in safety, whereas small companies had the weakest management involvement in safety in the metal products industry in Iran (Guilan Province). This result indicates that managers in large companies pay more attention to items related to management involvement in safety issues.

As any academic study, this study has some limitations. The first limitation is related to the field of study and the target population group. Industrial safety management focusing on safety and related areas in Iran is a new research topic. Therefore, evidence and documentations on safety and related areas to refer to and cite are very limited. The second limitation is that cultural dimension factors, which are a new topic of study in Iran, are important components influencing industrial safety. Hence, there is only little documentation available on safety in the manufacturing industries in Iran.

This study investigated differences in management involvement in safety in the metal products industry in Guilan Province, Iran, with regard to company size. However, to better understand the factors affecting companies' safety, it is suggested that future studies emphasise other specific components of safety values such as management involvement and safety performance in the industry or the potential impact of reporting systems or a safety climate on safety performance.

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