



Importance of the participation of the employee in the execution of projects: Management perspectives

Importancia de la participación del empleado en la ejecución de proyectos: Perspectivas gerenciales

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Received: 08/12/2017 • Approved: 28/01/2018

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ABSTRACT:

The objective of this study was to understand the interpretations that managers have about the participation of employees in the different phases of project execution. This research has been developed as a case study at the managerial level, it was developed in the public company scenario. The methodology was based on a qualitative approach. The analysis of data concluded that there is a direct relationship between the perception of managers and the participation of employees in all phases of project.

Keywords: Employee participation, risk management, accident, industrial plants.

RESUMEN:

El objetivo de este estudio fue comprender las interpretaciones que los gerentes tienen sobre la participación de los empleados en las diferentes fases de ejecución del proyecto. Esta investigación se desarrolló como un estudio de caso a nivel gerencial, se desarrolló en el escenario de empresa pública. La metodología se basó en un enfoque cualitativo. El análisis de datos concluyó que existe una relación directa entre la percepción de los gerentes y la participación de los empleados en todas las fases del proyecto.

Palabras clave: Participación del empleado, gestión de riesgos, accidentes, plantas industriales.

1. Introduction

In the field of industrial development, there are social and productive realities, which are related to the manager's decision and employee participation. In this scenario it is important that employees participate in safety decisions that we can rely on employees' willingness to use personal protection measures and participate in safety training programs (Boustras et al., 2015). The elements of success in business are based on their competencies including stakeholder management, scope, time, cost and risks, for which problems and decision making is very important to ensure that the project is successful (Panas et al., 2014), then the training in safe processes must be considered and must be understood as one of the necessary means to develop a safety culture (Vidal-Gomel, 2017).

The development of infrastructure projects for industrial plants, focus on a risk analysis to improve industrial designs, although it is noted that the provision of technology in systems or management platforms for public sectors is deficient (Ranerup et al., 2016).

Thus, managers to solve problems from the perspective of safe design, should use management systems and these contribute to reduce the risks of occupational safety and health and improve the performance of organizations (Mohammadfam et al., 2016), then these methods contribute to the shared management of experience and knowledge, which is useful for the limitations of the concept of management and the perspective of care (Ma and Dai, 2017).

On the other hand, international research has established methods for assessing the causes of disasters as a result of poor management practices. The optimization can focus on identifying the key success factors for decreasing emergencies and reducing extensive damage (Zhou et al., 2017). Other conclusions demonstrate the need to increase maintenance tasks and to consider indicators that allow to know the perception of the workers with relation to the motivation to apply safety practices (Shea et al., 2016), and thus to avoid mechanical failures of the equipment that are the main cause of the accident in industrial plants (Calvo Olivares et al., 2015). Another factor to be considered is the risk associated with hazardous material handling activities with the potential to cause accidents (Torretta et al., 2017). Risk management involves the strategy of safe design, optimization of economic and environmental resources, and incorporates the attitude of the investor towards risk and its mitigation (Giarola et al., 2013). The state that the public administration should consider awareness campaigns in the areas of health, and manage security in companies or promote comprehensive training for workers and managers, among others (Forteza et al., 2017).

The present research was developed in the public company scenario, the objective of this paper is to expose the manager's vision, related to the participation of the employees in the elaboration and approval of the projects in all phases.

The information provided by the managers was taken from an in-depth interview.

2. Development. Reference Frame

2.1. Risk management

The actions of Risk Engineering allow the interpretation of the integral scenario in

risk management, by considering the knowledge that affect the shared daily performances of technicians and other professionals. Thus, a good practice of risk management is to consider safety indicators, which play an important role in the prevention of accidents, (Tang et al., 2017). The complex concept of the safe design of the projects, has to guarantee the compliance of the strategy and the application of best practices of functionality in the different stages or phases of the project (Ax and Greve, 2013).

The management of the project manager must comply with, and support the safe design, it must also achieve a balance between the technical dimension of infrastructures and organizational requirements, to avoid accidents in the areas of infrastructure (Künneke et al., 2010). Consideration should be given to the commitment of government authorities and policy makers to ensure and enforce effective implementation of occupational health and safety procedures in industrial infrastructure projects (Gopang et al., 2017). Therefore we must consider that environmental regulation of hazardous projects with decision-making processes can lead to the exposure of human populations to technological hazards (Naime, 2017).

Thus, the participation of employees in the decision-making process, should be considered in risk management (Raudeliūnienė, 2014). Therefore, if employees in charge of engineering design tasks, reduce the problem of complacency of bad safety practices, the occurrence of serious accidents would be reduced (Årstad and Aven, 2017), which means that there is a relationship between the concept of motivation, workers' abilities and their influential factors (Raudeliūnienė, 2014).

The proposed total security management integrates approaches by supporting inherently secure design, which relies on the use of new technologies, simulations and staff revisions (Aneziris et al., 2017), and in this platform it is necessary to apply internal audits with sanctioning power to improve processes (Arntz-Gray, 2016).

2.2. Implications in Risk Planning

The identified risk factors are qualitative and are based on the personal perception, values and characteristics of individuals involved or in charge as workers, company managers, health and safety officials, project managers and others (Tchiehe and Gauthier, 2017). This relationship involves social and private interests, which should be aligned to reduce the high accident rates in the industrial construction sector (Forteza et al., 2017).

Within risk planning, economic crises in companies have become a motive for non-compliance with labor standards, a decrease in psychosocial health, labor insecurity, these are the factors that lead to a bad job outlook (Anyfantis et al., 2016). Additional to the risk plan, it is necessary to support the managers' constant commitment to safety in order to achieve real improvements (Tappura et al., 2017)

2.3. Participation of employees in the safe design plan

The extent of workers' participation in the enterprise from the point of view of the design of the plan requires the participation of a growing number of people aware of their performances, this generate improvements in risk management systems (Walter, 2017). From this scenario, aspects related to the leadership of the employees (workers) arise, unveiled to the committed organizational group through responsible participation. This means the participative promotion of a

process management and the empowerment of security, addresses management actions that include decisions regarding security (Zwetsloot et al., 2017) to develop activities, manage resources and achieve the objectives of safety.

3. Methodology

3.1 Study design and type of participants

The present research was developed in the public company scenario, specifically the case of the project management of the agro-industrial subsidiary of Petroleos de Venezuela. To understand the interpretations that managers have about the participation of employees in the different phases of project execution, from the perspective of safe design and industrial safety, the research team conducted a case study with exploration and descriptive. The sampling was intentional and considered the key social actors of project management, in this article all participants were project managers. Nine face-to-face depth interviews were completed. These managers had more than 20 years of experience.

3.2 Data collection and analysis of results

This paper is based on a qualitative approach. The methodology allows the study of human behavior from detailed descriptions in the project management scenarios. The findings are derived from the tables of contents designed for the transcription of the protocol material of the interviews and, at the same time served for the categorization, which was structured in two columns, the first of them, expresses the description (quotes) of the social actor, in the second of them, a category which is constructed by the researcher, and finally the code emerges and the line.

The information obtained was treated through the processes of categorization, codification and triangulation of information (Mays and Pope, 2000), by investigating the meaning given to the actions and behaviors perceived in the social interaction with social actors. Interview quotes presented in section 4 were translated into English from Spanish.

4. Results and Discussion.

This study results are shown by the information extracted (Quotes exposed) in tables 1 to 9.

4.1. Findings found in the category: Employees' participation.

The general information presented in the category shows us the importance of active employee participation, being this, the one who applies the safe processes in all phases of the project. According to the managers, this result focuses on reducing the need for increasing the maintenance tasks to avoid the mechanical failures of the equipment that are the main cause of the accident. Then, risk management strategy includes re-establishing and strengthening compliance with safety principles through workforce training, system redesign and operational procedures (Gnoni and Saleh, 2017) and to know that economic benefits are obtained when considering disaster mitigation in industries (Shreve and Kelman, 2014). See Table 1 for more details.

Table 1

Summary and selected quotes exposed by the manager (social actor 1) related to the category defined as employee participation

| Quotes exposed by the Social Actors (SA-1) | Axial category / Code |
|--|--|
| <p>I believe that it is important to train personnel in industrial safety and operational management of the areas of these industrial complexes, they are two needs that must be together (...), but all workers need to participate, we have to explain to the communities that this is a permanent solution since we have to prepare the people, the neighbor, the technician and university professional who is going to work on these projects in all its phases including the future operation.</p> | <p>Participation and training. coded as: PARTIC, EAP-SA1, Lines: 102-108</p> |

The second result is focused on the participation of the employee in the processes of safe design of the projects (see table 2), it is necessary to avoid material and human losses in the industrial plants to be developed, from the managerial perspective, therefore the responsibilities and functions of all workers involved in safety preventive processes must be incorporated (Segarra Cañamares et al., 2017).

However, security in the broad-spectrum, must be established as a primary objective in the construction projects of industrial plants, the workplace requires technological improvements, regulatory compliance, and introduction of occupational health and safety management systems, as well as a change of culture (Kim et al., 2016).

Today the employees' perspectives are important to reduce violations caused by the organization, these could be for example, volunteering for safety committees (Chmiel et al., 2017). The project manager's risk management should be better understood, as well as the determinants of a safety culture among the staff of the work centers and specific interventions to each stage should be developed (Haghighi et al., 2017).

Table 2

Summary and selected quotes exposed by the manager (social actor 2) related to the category defined as employee participation.

| Quotes exposed by the Social Actors (SA-2) | Axial category/Code |
|---|--|
| <p>From my point of view as a project manager, employees must participate in safe design practices, which will be executed for each discipline in the engineering of calculation and design of industrial facilities. The safety design, is defined in the procedures and it is declared in the manuals of the company (...)</p> <p>Well, it is true that the area of automation and control is collaborating, there is an opening for risk engineering, but let's say there are other areas without protection, for example, the project area supported by civil engineers, it is very important, if the mathematical calculations are correct we will have less risk of failures in structures that can cause disasters (...)</p> | <p>Practices safety. coded as: PARTIC, EAP-SA2, Lines: 136-146</p> |

A third highlighted factor, related to the quality of life (table 3), takes into consideration the discretion of safety activities as part of their work and these are

important in the relationships of job control and safety motivation for safety performance (Chmiel et al., 2017) and the ethical and psychological parameters must also be considered when facing a dangerous situation in case of disaster management (Tchiehe and Gauthier, 2017).

The results highlight the challenge of ensuring a holistic and multidisciplinary approach to the prevention of psychosocial risk factors for integrated OSH administration (Leitão and Greiner, 2017). Hence, the reduction of the psychosocial risk, contribute to decrease the worries of the employee, therefore contributing to the application of safe design practices and encourage safety behaviours between employees (Toppazzini and Konrad, 2017). It is also known that there is a significant negative correlation between the total security climate and all dimensions of occupational burnout in terms of frequency (Zarei et al., 2016). It should also be considered that the promotion of psychosocial management in preventive psychosocial systems and activities is likely to effectively improve overall psychosocial performance (Guadix et al., 2015). Therefore, when employees perceive that human resources management practices and project managers are motivating, they will be more likely to accept risks and target their behavior toward innovation (Escribá-Carda et al., 2017).

Table 3

Summary and selected quotes exposed by the manager (social actor 3) related to the category defined as employee participation

| Quotes exposed by the Social Actors (SA-3) | Axial category / Code |
|---|--|
| We have what is collective bargaining, as a trade union instrument that is discussed with the workers, to reach agreements for improvements in the worker's quality of life, and reduction of psychosocial risks, then there is framed what is the social security, (...) extended to the family, (health insurance), where you join the family and the social security of the employee (worker). | Psychosocial risks. coded as: EAP-SA3, Lines: 217-222 |

4.2. Findings found in the category: Risk Management

The main points of the interview are summarized in tables 4, 5 and 6. The analysis of the results focus, first of all, on being aware of the importance of the minimization of accidents, by considering that the control systems are of outmost importance from the industrial safety perspective (see table 4). If management is more committed to safety, these occupational safety goals will be achieved. (Chmiel et al., 2017).

Table 4

Summary and selected quotes exposed by the manager (social actor 1) related to the category defined as Risk management

| Quotes exposed by the Social Actors (SA-1) | Axial category / Code |
|--|---|
| I think that the system of risk minimization, as the instrumental navigation of monitoring and control of activities, is a source of learning from the experiences coordinated to the axis of industrial safety and of the application of the theory of risk engineering (...) | System and management. coded as: SYMA, SA1, |

Another result obtained in relation to risk management (table N°5) is, that the managers agree to promote the adoption of the procedures described in the manuals of engineering by discipline and in the areas of project control. Then, risk assessments are carried out at the design stage and necessary updates must be made (Pasman et al., 2017). It is confirmed that the total security framework seeks to understand how dangerous activities can be managed, such as handling of flammable substances, fires, to reduce their risk (Aneziris et al., 2017), and the need to increase maintenance tasks, help to avoid the mechanical failures of the equipment that are the main cause of the accidents (Calvo Olivares et al., 2015). The results also show that managers improve the quality of performance metrics by involving employees in their development (Groen et al., 2016). The fact of incorporating the advance in risk management as part of the strategic objectives of the organization, should also consider the promotion of workers' conscience in the design of adoption of engineering procedures (Lay et al., 2017). Then, in risk management the analysis of regulatory orders can be a tool to improve health and safety at work results, providing management indicators, leaders before injuries, illness or fatalities have occurred (Arntz-Gray, 2016).

Table 5

Summary and selected quotes exposed by the manager (social actor 2) related to the category defined as Risk management

| Quotes exposed by the Social Actors (SA-2) | Axial category / Code |
|---|---|
| The safe design is related with all workers and with the management of materials and processes attached to security, with regard to the application of a multidiscipline of know-how regarding risk. We, the managers must promote the conscience of the workers in the subject of design with adoption to the procedures of engineering (...) and improve the quality of performance metrics by involving employees in their development, also consider the participation of all personnel in the development and application of performance metrics, which guarantees better levels of efficiency in achieving the objectives, this is to do risk management. | Management and strategies. coded as: SYMA, SA2, Lines: 331-340 |

A third result highlights the fact of education in the area of disaster management or accidents (table N°6). Security culture allows to regulate the levels of risks (Antonsen et al., 2017); in the case of the study, it tries to minimize risks based on the understanding about the amount of culture and alterations that occur in the form of human behavior that should be detected in risk management. With a new strategy, it is considered that the people who have more control over their work activities, will have positive perceptions of their commitment to security (Pinion et al., 2017).

Table 6

Summary and selected quotes exposed by the manager (social actor 3) related to the category defined as Risk management

| Quotes exposed by the Social Actors (SA-3) | Axial category / Code |
|---|------------------------------|
| | |

We, as managers must comply with the process of industrial safety along with environmental laws, it is necessary that the management of risks, in the engineering stage of the project, consider the specific plans of protection against accidents, these will be based on the education of the people who live around the industrial plant that will be built. We, as managers must consider the participation of the workers in the management of industrial risks in each stage of the project, as an important factor in the reduction of accidents during the construction of the facilities and the reduction of accidents once the industrial installation is operational. The administrative systems and controls (...)

Management and strategies.
coded as:
SYMA, SA3,
Lines: 401-410

4.3. Findings found in the category: Integral vision of safe design

The discussion shows that safe design is a premise that must conform the unit risks of the company to protect people. Occupational health and safety management systems (OHSMS) is considered as a way to reduce injuries and illnesses for businesses of all types and sizes (Autenrieth et al., 2016).

Another highlight is making decisions from a purely economic perspective. They will probably never invest enough in preventive security measures, and companies will begin to have a negative impact on their financial results (Forteza et al., 2017). Then, investments in prevention seem to be positive for the health and safety of employees, but are more common in large companies (Bianchini et al., 2017). In this sense, promoting messages to public companies and educating the public on the cost of not taking preventive measures will, at the end, be an investment in Occupational Safety and Health (OSH) and therefore will bring more benefit than cost (Caraballo-Arias, 2015). See Table 7 for more details.

Table 7

Summary and selected quotes exposed by the manager (social actor 1) related to the category defined as Integral vision of safe design

| Description of the Social Actors (SA-1) | Axial category / Code |
|---|---|
| <p>The integral implementation of the safe design comprises the safety of all the people who work there, and of those who surround it to the industrial plants next to construct. We are in the presence of the rural communities that live near these industrial facilities, we must consider safety in order to prevent fires. Managers must consider the safe design of industrial facilities in a comprehensive manner and also promote the participation of all workers in all phases of the project. (...), the importance of occupational safety and health systems that reduce the levels of disasters must also be considered ... the investment scenario in the area of security is in this integral process. In this scenario the managers must apply leadership techniques to implement safe design practices when reviewing and correcting projects in engineering rooms (...)</p> | <p>Prevention. coded as: DISSE EAP-SA1 Lines: 385-397</p> |

The second relevant factor, mentioned by the managers, are the objectives of risk assessment as they help to identify the risks that affect the later stages of the life cycle (Aneziris et al., 2017). The organizational structure that provides a pattern of stability with employees can effectively work to achieve the goals linked to the safe design plan. Too many times it is easy to concentrate on certain aspects such

as safety instrumented systems (SIS), layer of protection analysis (LOPA), prevention (Mostia, 2009). In this context, the rules, safety obligations and regulations for risk, can be confronted with the participation of workers (employees) and the formal authority, this scenario allows leadership that impacts on the company's safety performance to reduce accidents (Zhang et al., 2017). The safety obligations are positively associated with employee safety compliance, safety participation and attitudes (Mullen et al., 2017) for these reasons there are environmental regulations that can lead to the exposure of human populations to technological hazards (Naime, 2017), see Table 8 for more details.

Table 8

Summary and selected quotes exposed by the manager (social actor 2) related to the category defined as Integral vision of safe design

| Description of the Social Actors (SA-2) | Axial category / Code |
|---|--|
| <p>Under this premise a risk management unit must be formed which carries the checklist. To fulfill more than any other point with certainty, because there are environmental laws, and we have to aim this section, where we are implementing projects, we are talking at the engineering level to adjust the integral needs to a safe design. (...), managers must set objectives to detect project risks</p> | <p>Safety procedures. coded as: DISSE EAP-SA2 Lines: 401-406</p> |

Other important element is that managers consider that support, in relation to safe design and employees' social improvement (see Table 9) are related, and that it is necessary to have the support of the government sector. Therefore, it is necessary to develop a public disaster risk reduction (DRR), and that education is conducted through collaborative partnerships and use the available media-communication to their full potential_ (Cole and Murphy, 2014). Then, it is important that protection is provided by the government and by employers as an integrated system (Cruz and Huerta-Mercado, 2015).

Table 9

Summary and selected quotes exposed by the manager (social actor 3) related to the category defined as Integral vision of safe design.

| Description of the Social Actors (SA-3) | Axial category / Code |
|--|---|
| <p>The safe design becomes a control methodology, with application to risk engineering, made for each of the different phases of the project, from a visualization to a conceptualization, basic engineering, detailed engineering, to the construction of the plant industry, to the stage of pre-start, start-up. (...) In each of the phases a qualitative and quantitative risk analysis is carried out, as in tests on steam pipe systems, storage tanks for combustible liquids, chemical materials, hazardous materials, all (...) the objective of safe design is to mitigate the conditions of risks that can cause damages (risk of disaster) we, and also the managers must consider the support of the public sector that supports the communities in the handling of disasters.</p> | <p>Safety procedures. coded as: DISSE EAP-SA 3 Lines: 111-121</p> |

5. Limitations

This research has been developed as a case study at managerial level, of exploratory and descriptive type, with a qualitative research approach, however the results cannot be generalized for all project managers, but they could serve as a reference in future research related to decision making from contexts of participation of workers and managers. It must be pointed out that this research and its methodological approach comply with the selection criteria of key informants, in-depth interview design, and the processes of categorization, coding, and triangulation of information (Mays and Pope, 2000).

6. Conclusion

The research reveals an integrative result of the strategic vision of the managers responsible for the projects, based on employee participation in the safe design practices implemented in the phases of the construction. In this sense the result emphasizes that the safe design applied in engineering management and projects based on the policy on industrial safety systems and the integral management of risks, has more relevance and importance in the descriptive component from vision and participation of workers under the legal framework in terms of mitigation of accidents during all project phases of industrial plants.

Other main points of each stage of project development, are focused in the vision of the managers when considering that the employees, in the area of safe design, are a key piece to reach high standards of safe industrial plants construction. Therefore, employees with high job control will be more likely to participate in injury and incident prevention programs.

The investigation also leads to the conclusion that risk management in the managerial context and under a comprehensive approach, encompasses the development of the policy of social and safety benefits for the organizational collective (workers); this means that, it contributes to the holistic improvement of the workforce, its family environment, and the communities or inhabitants that are close to the industrial plants.

Another feature is the cultural, political and social parameters, which clearly show the impact of the sociocultural context in which the affected individuals evolve on the acceptability of the risks in the safety practices. It is also concluded that the leadership of the managers contributes to improve the application of good practices of safe design made by employees.

As a final remark, this case study establishes the guidelines for future safe design research in industrial process plants in the different production areas of oil, gas, agribusiness and other chemical process industries.

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Revista ESPACIOS. ISSN 0798 1015
Vol. 39 (Number 14) Year 2018

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