Lifelong Education for Sustainable Environmental Development: Employees' Safety Culture in Oil and Gas Industry

Natalia Verbitskaya[*], Ola Alashoor

Ural State University of Economics
[*]*Corresponding author. Email: n.o.verbitskaya@usue.ru*

ABSTRACT

In our study, we look at safety culture as an area of continuing education and employee development using the oil and gas industry as an example. It has been analyzed what constitutes a safety culture, which today has a large number of interpretations and definitions, in particular we will be interested in the interaction and mutual influence of the industry safety culture and the national safety culture. The interaction between national culture and organizational security is today one of the most important problems of human development in organizations and in countries seeking to create a strong culture of security. The study of the relationship between security and national culture also confirms the need to take into account on the part of any industries and organizations the influence of national culture on their functioning and on the effectiveness or appropriateness of security measures.

Keywords: *"Lifelong Education "1, "Sustainable Environmental Development" 2, "Safety Culture" 3, "Oil and Gas Industry "4.*

1. INTRODUCTION

Not so long ago (2002-2014) ended UNESCO's decade dedicated to education for sustainable development [1]. One of its most important results was the understanding of the global nature of educational processes and their role in the sustainable development of society, in preserving the environment and environmental education. Education has ceased to play a niche role in economic processes and has become an active force. An important condition for the inclusion of education in the processes of sustainable economic development and environmental preservation is its continuity. In this study, we consider lifelong education as the main basic condition for human development in the formation of a profession in labor activity. The widespread use of distance forms of education, the active development of the system of intellectual support for educational processes allows us to consider in a new way the processes of professional development of a person as an employee in the aspect of lifelong education. Within the framework of this study, the phenomenon of safety culture is considered as one of the components of a person's professional development

in the context of continuous education and professional self-improvement.

Why is the aspect of safety culture chosen in the context of environmental education, continuing education and personnel development? Using the example of the oil and gas industry as well as a number of other industries that continue to cause irreparable damage to the Earth's ecology, it is necessary to focus on the safety culture of workers in this industry in the context of their impact on global economic and environmental processes.

The oil and gas industry included the global processes of exploration, extraction, refining, transporting, and marketing of petroleum products. It is also one of the fastest growing industries in which huge investments and large number of manpower are employed in the business operations, and Since the early decades of the twentieth century, the oil and gas sector has mobilized a number of service networks and specialized segments that are part of the industry's many levels.

The activities in this chain can be grouped into four major categories: exploration and production, transportation, refining and petrochemical industries,

and distribution. The nature of the oil and gas industry's activities, which occupies a prominent position in the global energy sector, depends on a network of companies operating from exploration to distribution. This broad spectrum of action has favored the production chain process of sectorization and restructuring,

1.1. Safety Culture in Oil and Gas Industry

The world is full of uncertainties and risks, which can be described as the product of two factors: the possibility of failure and the related consequence (Bea, 2011). This risk includes Several types of accidents, based on the frequency of occurrence and the degree of loss [2]. Despite widespread interest in the notion of "safety culture," there is little consensus on what it entails. On crucial problems, anthropologists differ with management consultants, organizational theorists, and psychologists. Much of the "management literature," in particular, appears to take a more instrumental approach to the idea. There are several approaches to understanding culture, ranging from the linguistic level with a focus on discourse and conflicts to a "taken for granted" level where "tacit knowledge" is the key phrase, whereas culture as "webs of significance" can be understood from an epistemological standpoint, in short, how we grasp the world. In addition, different cultural perspectives like integration, differentiation and ambiguity are important in cultural analyzes, but whether one is dealing with a single unitary culture, many subcultures, or no culture at all, is not a theoretical question but an empirical one, as will be demonstrated using oil drilling as a case.

The authors associate the introduction of the concept of safety culture with activity. International Nuclear Safety Advisory Group INSAG-1 in 1986, where this term was used [3]. Subsequently, safety culture over the course of three decades has become an independent important area of research and has affected almost all production needs of various sectors of the economy. Currently, the concept of safety culture covers healthcare, transport, nuclear energy, construction, and the oil and gas industry [4, 5]. Maintaining and developing a safety culture is an independent area and an effective mechanism for the transmission of knowledge. For this reason, in our study, we consider safety culture as an area of continuing education and development of workers using the example of the oil and gas industry. In this aspect, a number of studies are interesting where safety culture is closely related to the concept of culture maturity based on the Hudson model for oil and gas companies [6]. The works clearly demonstrate how the model works at all five levels: what speaks about its significance and testability for this branch of environmental knowledge.

2. MATERIALS AND METHODS

It is worth noting that the concept of safety culture has developed as a result of the analysis of major accidents such as Chernobyl and is based on a retrospective analysis of behavior in crisis situations, the problem of the inability of the head of organizations, politicians to manage the risks associated with hazardous technologies. While these accidents were national disasters, the situation reflects more than the individual values of those affected by the disasters. In many ways, the behavioral response to these accidents is not the result of the influence of only national culture on the safety culture. In many cases, we are talking about certain technical failures associated with individual accidents, including, for example, incidents of loss of working time, which oil and gas companies often try to save [7].

What actually constitutes a safety culture, which today has a large number of interpretations and definitions, in particular we will be interested in interaction; it is the influence of the industry safety culture In particular, and the national safety culture, the Commission on Safety Health in 1993 defined safety culture as a product of individuals group values of relations in the perception of competence and patriotism [8]. At the same time, most research on safety culture focuses on the study of individual behaviors, beliefs, attitudes, and so on. In this case, we will be interested in just the values determined by the positive aspects of the national culture. A number of scientists have focused their attention on the security climate. From this point of view, in an organization [9], safety culture is defined as a set of employees' views on the implementation of organizational policies and procedures related to safety, including at the level of industry and country policies.

The interaction between national culture and organizational security is today one of the most important problems of human development in organizations and in countries seeking to create a strong culture of security. The study of the relationship between security and national culture also confirms the need to take into account on the part of any industries and organizations the influence of national culture on their functioning and on the effectiveness or appropriateness of security measures. At the same time, there are relatively few empirical studies of such influence in the scientific literature.

It is quite obvious that, depending on national characteristics, attitudes towards risk, certain behavior in situations related to the operation of hazardous equipment, including in the oil and gas industry, differ significantly among people of different nationalities and different cultures. We use the definition of national culture [10] as a collective programming of values acquired once as a result of growing up in a certain

nation, defined as a general tendency to give preference to one state of affairs. In this case, the national culture forms a collective way of behavior [11] in situations associated with risk and danger. This gives us a diagnostic opportunity to consider the national culture as a mental program distributed by a group of people, which largely determines the formation of a safety culture and the perception of the necessary knowledge of the requirements of attitudes that are presented to an employee in a given industry, in this case, oil and gas.

An additional problem in separating the influence of core values, attitudes toward risk, and risk taking is that a growing body of data supports the idea that attitudes toward risk and behavior are domain-specific in economics and work. This is consistent across domains, and means that the situational circumstances of different industries will have a significant impact on an individual's risk appetite. This means that people of different nationalities working in the same industry may be risk averse in their work activities, but not, for example, in their personal lives.

This suggests the need to consider the problem of fundamental national values and national mentality in the analysis of the development of safety culture.

3. RESULTS AND DISCUSSION

3.1. Longlife Training's Relationship to the Idea of Occupational Safety Culture

One of the activities in the safety management architecture that has been universally acknowledged as a factor of safety performance across vocations and sectors is safety training. This is happens for a reason that it frequently provides a mechanism for organizational accident prevention and control by teaching employees about the significance of following safety regulations and procedures. Good safety training is critical for the success of OSH (Occupational Safety and Health) programs [12] because it improves behavioral skills, relevant information, and/or attitudes, and works as a catalyst for forecasting accidents. As a result, in order to improve OSH performance at both the individual and organizational levels, management should establish systematic, comprehensive safety and health training programs for new employees, provide a mentor for them, and use a partner system to help orient them to the safety, health, and quality systems, on the other hand, advised businesses to view safety training as proactive rather than reactive, and to integrate it into the organization's entire management structure. He further advised that safety training should not be made to be reactionary to specific problems or crisis, but proactive in all situations. Employees can directly participate in decision-making processes to guarantee workplace safety across the business by serving on safety committees. On the other hand, emphasized that in order

for the committees to be effective, they must be given actual ability to implement the necessary changes in all safety-related concerns, when the employees involve in the design and implementation, monitoring, and follow-up of the safety management process, they will have a sense of ownership of the programs, which will eventually lead to the reduction in accidents and injury rates. Involving workers in the safety management process was the key to organization's safety performance because such involvement empowered the workers psychologically via their participation in safety committees, examined different HSE (Health, Safety and Environment) occupational safety and health studies and discovered that firms that encouraged workers' engagement in safety and health-related topics had lower accident and injury rates.

Safety managers are responsible for ensuring that all workers are properly educated on safety and health rules, procedures, issues, and other pertinent information. This may be accomplished via the use of the following methods: frequent safety meetings, regular personal contact via walk-around, safety committees, and publications in the form of newsletters, e-mails, memos, and so on. Regular performance feedback may be utilized to communicate with employees via sign posts, danger signs, and other safety indicators. This generated data will not only assist the organization to have a safety system in place, but a behavior- and evidenced-based safety maintenance system too. The degree to which a company has a defined mission, duties, and goals, defines behavioral standards for employees, and implements a safety system to rectify workers' safety behaviors is referred to as safety rules and procedures. According to studies, safety regulations and procedures have an impact on workers' safety habits. Safety promotion policies are a form of safety practices purported to influence safety compliance. We may defined safety promotion policies as a process that aims to ensure the presence and maintenance of conditions that are necessary to reach and sustain an optimal level of safety. They further noted that the process involves a combined effort of individuals, organizations, communities, and nations to create safety supportive environments, While generally studies tend to demonstrate a direct relationship between safety management practices and safety compliance, our study is different as we theorize that the practices affect safety compliance through the mediating effect of safety participation.

Despite the fact that safety participation as one of the key dimensions of job performance, building on job performance, we argue that safety participation is a precursor to or antecedent of safety compliance, consistent that it contributes to the development of a safety culture. They defined safety participation as behaviors that indirectly contribute to a worker's personal safety and encourages the development of an

Table 1. Some Comparative Evidence on the Impact of National Cultures on Safety Culture Learning

	Finland [13],[14]	Russia	Iraq [15],[16]
Knowledge	safety self-efficacy. safety awareness. safety behavior. Compliance. (safety compliance).	weak knowledge of safety culture	insufficient tools, inadequate technology, bad organizational management, a lack of safeguards, a lack of suitable services, employee misconduct regarding safety regulations, and insufficient training
Motivation	development of an environment that supports safety helping co-workers to promote the safety program within the workplace	management commitment, communication and feedback, hiring practices and employee participation	bonuses, annual leave and discretionary certificates
Tradition	create a safety culture in recognition to their attitudes and behaviors of employees	insufficient training. Traditional practices in safety systems.	poor training programs

environment that supports safety. For example, helping co-workers when they are working under risky or hazardous conditions and voluntarily carry out activities that contribute to improving workplace safety are some of the behaviors that reflect safety participation. We suggest that safety management practices may make employees comply with safety requirements while doing their job duties because the practices create the right environment for employees to participate in behaviors that contribute to the organization's safety culture. . Furthermore, we contend that preventing workplace accidents involves a conscious decision of the employee him/herself. In this context, encouraging co-workers to work safely works as a facilitating mechanism that results in whether they will comply with safety standards and procedures while at work. Voluntarily helping the organization or the co-workers to promote a safe work environment is also known as safety citizenship behavior.

The Table 1 presents differences and similarities between systems in the management of Occupational Safety in oil companies of different countries in terms of knowledge, motivation and behavior (it means employee or organization behavior associated with performance). As it Is implementing a safety culture at a company that is a melting pot of cultures and experiences necessitates an integrated, comprehensive approach as well as the usage of external standards and models. Such models might take the shape of highly experienced individuals who can act as role models and enable for the progressive development of a safety culture across the business. Employee attitudes and beliefs are difficult to alter through direct persuasion. Acting and doing, however, can lead to thinking and believing when influenced by organizational rules, In this case there is a need for an in- depth analyses and knowledge to start to develop and implement a new culture which will create a basis for the strong safety culture with an appropriate education background,

training and competencies as well as attitudes and behaviors of workers with a strong support of leadership leads

4. CONCLUSION

The primary goal of this article was to analyze related empirical literatures and underline the necessity to

investigate safety performance in the Iraqi, Russian and Finnish oil and gas industry.

In conclusion, as a conclusion regarding the prospects for the development of a national security culture in different countries, you would like to link digital support within the framework of Industry 4.0 and digital transformation.

4.1. How Can We Use Technology Support in a Culture of Safety in the Oil and Gas Industry?

The settings in which oil and gas are produced are varied. Requirements in a heavy oil environment are substantially different from i-field deliverables in an offshore scenario; nevertheless, they may interact with fundamental IT systems in a similar manner. Level 0 teams are creating an uniform information architecture, web service/interoperability architecture, and real-time data architecture to optimize re-use of common functions and enable for priority functionality development. The details of these designs are being created independently by the co-located project teams, but they are leveraging similar technology and philosophical approaches.

Although the oil and gas sector may be fiercely competitive, oil majors and others are increasingly banding together to find out how to effectively address the problems and possibilities that digital technology present. Experts gathered to explore how new

technologies and digitalization are altering safety, an issue that is essential for all of them to do right. Ian Ferguson, general manager of safety and environment for deepwater at Shell, sees an industry and society whose actions are more and more premised on care. But he's concerned about the pace of digital technologies within that context. "We're not doing very well as an industry, for those of us in the safety and environment function, in really leveraging technology to exhibit that care, Given the volatility of the oil and gas markets in recent years, it's tempting to believe that safety will be sacrificed in favor of production. However, Jim Andrews, vice president of health, safety, and the environment (HSE) at the oilfield service firm Schlumberger, argued that safety and profitability are inexorably connected. "It's incredibly simple: you nearly never have an excellent HSE performance and a dismal financial performance. "Let your staff feel you care, and they perform an excellent job for you," he advised. "Many sites with poor safety performance also have high absenteeism and low production—all of these things go hand in hand." In this case, Digital transformation is the transformation of company activities, processes, products, and models to fully capitalize on the opportunities presented by digital technology, which is characterized by development, growth, innovation, and disruption. In specifically, "digital disruption" refers to the scenario in which new technology competes with old business practices, which we now frequently refer to under the ideas of cloud computing and big data. This property will assist businesses in creating a new model that is more efficient and convenient by utilizing digitized data and procedures. As it helps to increased hydrocarbon recovery, digital technology in oil and gas industries can have a substantial financial impact. Especially Safety Management in this industry, it works in the traditional way restricted by normal activities and training, so it is important to digitize within the field of Occupational Safety and health management to find solutions and analyze incidents fully. Many industrial organizations, such as chemical plants, rail transportation systems, and civil sectors, analyze their incident reports as part of their safety management systems to determine root causes and share lessons learned in order to prevent similar incidents from recurring in the future. However, technical, organizational, and human variables frequently interact in complicated, multi-directional, and unpredictable ways that can be difficult to untangle in aggregate.

Investing in digital technologies to enhance oil safety is necessary to guarantee business continuity, develop operational resilience, safeguard frontline employees, and keep essential operations running, EHS leaders must manage and react to change more than ever before. Organizations that have integrated digital thinking into their approach to EHS management are better positioned to react rapidly.

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