Review Article

Creating a Culture of Prevention in Occupational Safety and Health Practice

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ABSTRACT

The incidence of occupational injuries and diseases associated with industrialization has declined markedly following developments in science and technology, such as engineering controls, protective equipment, safer machinery and processes, and greater adherence to regulations and labor inspections. Although the introduction of health and safety management systems has further decreased the incidence of occupational injuries and diseases, these systems are not effective unless accompanied by a positive safety culture in the workplace. The characteristics of work in the 21st century have given rise to new issues related to workers' health, such as new types of work-related disorders, noncommunicable diseases, and inequality in the availability of occupational health services. Overcoming these new and emerging issues requires a culture of prevention at the national level. The present paper addresses: (1) how to change safety cultures in both theory and practice at the level of the workplace; and (2) the role of prevention culture at the national level.

1. Management and culture

The incidence of occupational injuries and diseases associated with industrialization has declined markedly following developments in science and technology, such as engineering controls, protective equipment, safer machinery and processes, and adherence to regulations and labor inspections [1]. However, the decline in occupational injuries and diseases has only been minimal, leading to increased interest in health and safety management systems. Although the introduction of these systems has further reduced the incidence of occupational injuries and diseases, occupational safety and health management systems are not effective in workplaces with a poor safety culture [1]. The International Labour Organization (ILO) also noted that a key element for occupational safety and health management is promoting a culture of prevention within the enterprise [2]. Introduction of a positive safety culture can therefore achieve further reductions in occupational injuries and diseases.

The first time the term "safety culture" appeared in the literature was when the International Atomic Energy Agency introduced the term in its 1986 Chernobyl Accident Summary Report to describe how the thinking and behaviors of people in the organization responsible for safety in that nuclear plant contributed to the accident [3].

In 1993, the Advisory Committee on Safety of Nuclear Installation (ACSNI) investigated disasters such as the Chernobyl meltdown, the Kings Cross fire, the Piper Alpha explosion, and the train crash at Clapham Junction, concluding that safety systems in these workplaces had broken down. These breakdowns were not caused by the method of managing safety, but by problems with the "safety culture" of the responsible organizations. The lesson drawn from these disasters was that "it is essential to create a corporate atmosphere or culture in which safety is understood to be and is accepted as the number one priority" [4].

Fig. 1 displays accident statistics over time in the construction industry in Hong Kong from 1986 to 2013, showing that the development of a safety culture markedly reduced the number of accidents [5]. Although technology and occupational health and safety management systems have made great strides in creating a safer world, the introduction and enhancement of a safety culture

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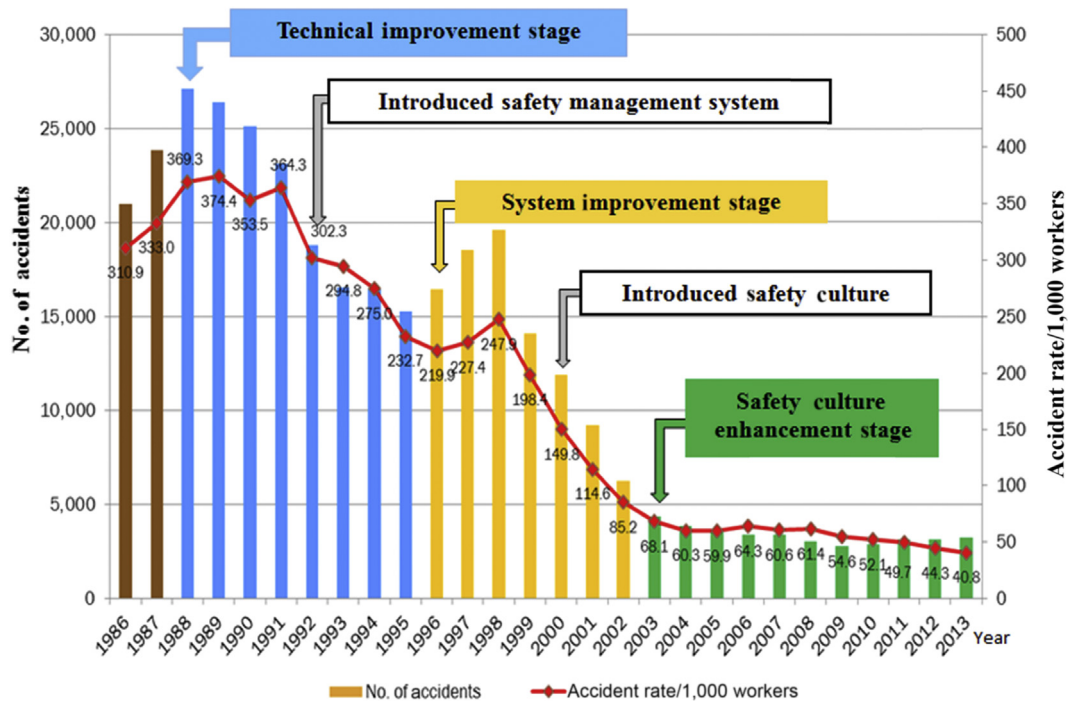   E-mail address: yanghokm@ulsan.ac.kr (Y. Kim).

Fig. 1. Accident statistics of the construction industry in Hong Kong.

within the workplace is the key to further improvements. The Hong Kong Occupational Safety & Health Council promoted work safety awareness in employers and employees of high-risk trades to promote safety culture in workplaces. This organization also cultivated safety culture at the community level and developed a "safety culture index" to evaluate the effectiveness of strategies that attempt to improve safety culture [5].

An occupational safety and health management system is not effective unless it is accompanied by a positive safety culture in the workplace [1]. Many organizations that have introduced new occupational health and safety management strategies have failed to show improved effectiveness because these strategies did not consider the impact of the organizational culture.

Work in the 21st century has been characterized by expansions in the service and knowledge sectors, increases in the numbers of small businesses, nontraditional work schedules, precarious workers, worker mobility, and older-aged workers [6,7]. These characteristics have resulted in new and emerging issues related to workers' health, including new types of work-related disorders, noncommunicable diseases (NCDs), and inequality in the availability of occupational health services [8,9]. Overcoming these new and emerging issues requires a culture of prevention at the national level.

The objective of the present paper is to address: (1) how to change safety cultures in both theory and practice at the level of the workplace; and (2) the role of prevention culture at the national level to deal with new and emerging work-related health issues as well as traditional occupational diseases in the rapidly changing work environment.

2. Definition of safety culture

In 1993, the ACSNI Human Factors Study Group defined safety culture as "the product of individual and group values, attitudes, perceptions, competencies and patterns of behavior that can determine the commitment to, and the style and proficiency of an organization's health and safety management system" [4]. A safety culture has psychological, behavioral, and situational components.

The psychological component consists of shared values, attitudes, perceptions, and beliefs that drive decisions and behaviors regarding safety [10]. The behavioral component can be defined as the methods regarding safety in the workplace, and the situational component as the policies, procedures, regulations, organizational structures, and management systems related to safety.

The International Atomic Energy Agency has described five characteristics of a positive safety culture [11]. First, leadership is the highly visible commitment to safety by top management, a characteristic vital for providing a positive safety culture. Second, safety should be clearly communicated as a value, not as a priority that can be traded off against cost and schedule. Third, decentralized decision-making and accountability of key groups responsible for safety is important for creating and maintaining a positive safety culture. Fourth, all employees should learn about safety and contribute ideas on improved safety. A positive safety culture is achieved when employees learn from insight and intuition rather than incidents, and change their ways of thinking and acting by sharing their experiences and addressing shared problems. Finally, a positive safety culture is one in which safety is a top priority and is integrated into every aspect of the company. In particular, among the five characteristics, the leadership of employers is the key to developing a positive safety culture.

Single organizations have unique organizational cultures and safety cultures. Safety culture can be divided into five levels of development, from "Pathological," to "Reactive," to "Calculative," to "Proactive," to "Generative" [12–14]. In a "Pathological" safety culture, employers and workers do not care about violating safety rules; this is often termed a "No care" safety culture. In a "Reactive" safety culture, safety becomes important only after an accident; this is often called a "Blame safety culture." In a "Calculative" safety culture, systems are in place to manage all hazards; this is often called a "Planned safety culture." In a "Proactive" safety culture, workers do not work on problems they find, but avoid problems in advance to improve the work environment. A "Generative" safety culture is a dynamic safety culture, in which safety is built into ways of working and thinking. Thus, a poor or pathological safety culture