

Safety Culture And Occurrence Of Accidents: Review Of Literature

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Abstract: One of the things that can determine the success or failure of organizations apart from what is normally known being finances, other organizational communication issues in companies etc. are safety culture. This study is to find out the relationship between the safety culture and the occurrence of accidents in literature. Some of the dimensions that were looked at are: management concern for safety, safety training and its influence on occurrence of accidents, employee concern for safety and whether employee personal experience can have influence on the occurrence of accidents. According to the results obtained with the recent literature on safety culture, it has an inverse relationship between occupational accidents. It was finally noticed that: People's attitude, ideologies, values, customs and beliefs can affect the safety culture of an organization and can influence accident occurrence, Safety culture involves the organizations culture and the safety conducts of all employees in the organization, There is no widely accepted definition for safety culture however, it can be applied successfully if employers get to know their employees well, Management or leadership have a responsibility for forming safety policies and procedures and setting production goals if an organization can experience a good safety culture, Safety culture of an organization has influence on the occurrence of accidents and Providing industry training on safety helps reduce the occurrence of accident at the work place.

Keywords: safety culture, Safety Climate, Accidents

I. PREVIOUS STUDIES

The observation of occupational safety and health has been in existences because the work surroundings became structured. Hippocrate (460-377 BC) is reported to have written on the damaging results of an unhealthy administrative center on slaves, and Caesar (100–forty BC) became pronounced to have an officer in charge of the protection of his group (Way, 2002).

II. EVOLUTION OF MODERN DAY SAFETY CULTURE

It is typically ordinary that the understanding of safety culture stepped forward from the upshot of a series of screw ups, specifically in Europe. Safety instances grew from the Flixborough coincidence in 1974. This was followed by the Seveso incident in 1976, and the Piper Alpha catastrophe of

1987 (Hudson, 2001). The Piper Alpha inquiry identified the need for efficient protection management with safety instances used to show the success of the device (Hudson, 2001). However, in the mid Nineteen Eighties the fuel multinational businesses such as Shell, recognizing the alarming risks, got down to implement methods to deal with cultural troubles through appreciating safety as being of top most importance and that it turned into no longer just a an individual responsibility but for all. Proposals for the giant aim putting regime which supposed that society sets standard dreams and groups discover their personal way of attaining those desires have been tabled and followed. This approach is used within the Norwegian Petroleum Directorate's (NPD) legislative foundation (Hudson, 2001).

The International Nuclear Safety Group's (INSAG) summary document on the placed up-twist of fate evaluate meeting at the Chernobyl twist of fate, posted by means of the IAEA as safety collection No. 75-INSAG-1 in 1986, used the

time period “safety culture” for the first time to explain a set of things associated with the organisational elements of safety (Choudhry, et al., 2007). The term “safety culture” become no longer developed on the idea of an organizational way of life studies or other studies in any other field (Choudhry, et al., 2007). The term “safety culture” became in the end referred to in important coincidence investigation reviews, which includes space shuttle in Columbia (NASA, 2003) and plenty of railway failures consisting of the Clapham Junction (Hidden, 1989), Ladbroke Grove (Cullen, 2001) and the Waterfall catastrophe (McInerney, 2005) that of the Zeebrugge ferry sinking, the King’s go Underground fireplace, the Clapham Junction catastrophe, Piper Alpha (Clarke, 2000) and the structural break up and crash of Continental specific Flight 2574 in Texas on September 11, 1991 (Wiegmann, et al., 2004).

The mistakes and violations of working processes which contributed to the Chernobyl disaster have been visible through a few as being evidence of a poor safety culture at the plant. The identification of a poor protection lifestyle as an issue contributing to the accident, brought about a massive range of research investigating and trying to actually measure safety culture in a ramification of different high-threat and excessive-hazard industries (IAEA, 1991). Despite the fact that the importance of safety culture is extensively familiar, there is still little settlement about what is supposed through the term (Lee, 1998). Turner et al., (1997) of their contribution recognized safety culture as in all likelihood the main issue in modern-day wondering, because the international Atomic energy agency (IAEA) document in 1991 on the Chernobyl catastrophe which introduced the idea of a safety culture to a much broader world, failures springing up from the culture of an organization have been perceived as the cause for fundamental injuries occurring. Moreover Low and Sua, (2000) additionally argued that, the revolution and modifications in safety management system must emerge as an obligation in practicing safety action and that could be managed over an extended time period but as a substitute personnel had been made to come back to terms with the need to be protection conscious.

III. DEFINITION OF CULTURE

The concept of culture have emerge as first diagnosed to be represented in a very sizeable and preferred experience and additionally described because the developments of any specific human organization which may be exceeded on from one era to the following. Additionally, the concept is often dealt with as a part of a dichotomy that's centered on spherical issues consisting of whether or not an enterprise has a sturdy culture and which developments make the sort of culture, (Reason, 1997, Hale, 2000; Guldenmund, 2000). For many years “culture” has been used as a management feature; however, it comes out with a dichotomy in which means – to start with it's been used as an illustration of ways an organization can sell the value systems that act as a cohesive device for participants of the teams (Holt and Wigginton, 2002). Culture consists of a collection of human’s interests; things along with share values, attitudes, ideologies and

beliefs in addition to customs that commonly define a collection of humans (Hoecklin, 1995; Schneider and Barsoux, 2003). The significance of culture to industry does now not cease within the anthropocentric view, rather, its miles pushed by using the strategic realization that no driver for alternate can be achieved without developing an influential force that might undoubtedly impact human being’s pursuits and values (Wheelen and hunger, 2006). Culture displays belief or value, even as climate relates to perception or attitude (Guldenmund, 2000, 2007). If any employer ignores human’s lifestyle, they could face critical demanding situations (Morton and Ross, 2008). Even though culture is important, it can't be used to give a reason behind the keenness on how humans use culture in their strategic preference making to benefit the organization (Johnson et al., 2009).

The Cambridge Dictionary of Psychology (Matsumoto, 2009, p. 146) defines it as: “*a network of loosely interconnected knowledge items produced, reproduced, and updated by a collection of interdependent individuals. An item in the network may refer to a certain declarative knowledge (know what: e.g., beliefs about the social norms) or a certain procedural knowledge (know how: e.g., thinking styles).*” The Dictionary.com (2010) defines culture as: “*The totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought*”. In developing an understanding of culture, it is important therefore to also comprehend the different experiences, which would impact, and guide individuals in their life (Cummings and Worley, 2014).

IV. ORGANIZATIONAL CULTURE

Clarke (1999), and Cooper (2000), theoretically defined safety culture moreover as a sub-element of organizational culture, which is a concept to have an impact on member's attitudes and conduct in terms of an organization's safety performance. Lee and Harrison (2000) argue that no matter the truth that the definition for safety culture varies, it nevertheless elements to the fact that there may be continuously a consensus toward safety culture being a pre-emptive thoughts-set to safety. Furthermore, Lee (2003) described safety culture as a set of beliefs, norms, attitudes and socio technical practices which are concerned with minimizing the exposure of people, inside and beyond a corporation, to situations considered dangerous or injurious to their fitness. In keeping with Zohar (2003), safety culture represents the individual and group values, attitudes, perceptions, and behavior styles that reflect an organizations' commitment to workplace safety. In effect, safety culture denotes the underlying beliefs and values of a business enterprise. Havold, (2005) also argued that, organizational culture and safety culture are summary ideas, which provide researchers an superb degree of freedom on how they respect such theories and placed them into practice.

Fang et al, (2006) opined that safety culture can be defined as the way safety is taken into consideration in a company such as “signs and symptoms, beliefs, and values that the organization owns about safety”. Choudhry et al. (2007) hold that the idea of culture has been oversimplified in

many organizational studies, especially due to a superb variety within the methods in which culture has been conceptualized and the form of culture paradigms used in organizational studies (Wiegmann, Zhang, von Thaden, Sharma, & Gibbons, 2004). In modern organizational studies, organizational culture appears to be a bypass-key to the majority of areas of organizational performance. It impacts management (Baumgartner, 2009), information structures (Martinsons, Davison, & Martinsons, 2009), the social duty of companies (Ubius & Alas, 2009), human aid management (Grueso & Anton, 2008), organizational trust (Lawal, 2008) and management delight (Lawal, 2008) to say simply the modern researchers. Furthermore, Clarke (2006), posits that the safety culture, literature normally represents three wonderful aspects of labor safety, therefore, attitudinal strategies which measure personnel' attitudes toward safety, the perceptual strategies, which also measures personnel' perceptions of the work environment, thus, organizational rules and practices and finally, the blended-models, approaches which combines some elements of mind-set and perceptual measures. In keeping with Chan and Chan (2011), having an influencing on of the safety culture overlaps organizational way of life and safety.

Consistent with Öz et al, (2013) the mindset, behavior and conduct of workers have an extreme impact on the level of adherence to safety standards. This suggests that there is a lack of consensus on how the safety culture perception is known, as there may be no widely usual definition of the idea (Wiegmann et al., 2002; HSL, 2002; Antonsen, 2009, Guldenmund, 2010). Consistent with Morrow et al., (2014) safety culture can be described as the shared assumptions that are advanced for the work surroundings with the intention to function competently on everyday basis. Kelloway, Mullen, & Francis (2006) examined that the transaction-passive management style has an adverse impact on each safety and safety climate cognizance. Leaders of the organization have the capability to nurture safety at the organizational level of the attitudes could have an effect on an extremely good outlook for safety (Burton et al., 2004; Fernandez-Muniz et al., 2007). Regardless of the reality that every leader in organizational settings could have a particular leadership style, it is argued that particular functional positions (directors, managers, supervisors) have an effect on safety in any other manner (Flin & yule, 2004; Luria, Zohar, & Erev, 2008; Zohar, 2000).

Evaluating the particular cultures and ensuring enough coordination for those cultures has been taken into consideration a vital part of management (Singer, et.al, 2009). Buchanan and Huczynski, (2010) described Organizational culture as the manner matters are achieved in an organization; and that is driven with the aid of the way the business organization has been structured (Anderson, 2010) and the way the leaders of the organization have set it up for the enterprise to achieve success (Abrell-Vogel and Rowold (2014). Management is the driving force of culture and "in turn drives behavior" (Oil and gas producers, 2013, p. 11). As such, leaders need to have the capacity to evaluate how nicely culture is doing and when it need to be adjusted (Cheung, et.al, 2012). The roles which leaders play in assisting the organizational culture appears to affect the future and present goals and improvement of companies (O'Reilly, et.al, 2014).

A few successful organizations have manifested with robust leaders, which have then allowed for a few exceptional strategies with strong cultures which also can help permit for the conclusion of strategies (Hysong, 2014).

Studies on organizational culture has been directed greater in the direction of what can certainly be quantified, consisting of the attitudes and perceptions of employees, and the conditions appeared to fit the perceptions of personnel (Parmelli, et.al, 2011). A focus on organizational culture has now not received as much influence in terms of an organizational science making social technology extra quantitative (Parmelli, et.al, 2011). Even as most companies have a culture, a few cultures may be more potent or weaker than others, largely due to the influence of management (Baloğlu, 2012). Organizational cultures often considered the robust cultures to be advantageous for firms as it helped ensure commitment, identification, and the incentive of the participants of the company (Baker, 2002; Cheung, et.al, 2012).

The point of interest on organizational culture has within some time period been widespread consistent of values, beliefs and actions of the participants of the organization and the extent that those values or beliefs are being implemented all through the enterprise (O'Reilly, et.al, 2014). Consequently, it may be argued that a robust culture is one that has been provided as an entire set of values and beliefs for any corporation (Shafritz, et.al, 2015).

V. RELATIONSHIP BETWEEN SAFETY CULTURE, ORGANIZATIONAL PRACTICES, AND ACCIDENT OCCURRENCE RISK INDICATORS

The research literature discusses several competing methods to growing an advantageous safety way of life via organizational practices and values (Hale, 2000; Richter & Koch, 2004). Given the issue of defining safety culture, the trouble of how to examine safety culture remains, and because of this, a majority of the research awareness typically on safety climate. Despite a couple of tries to give an explanation for safety culture through competing models, there may be constrained empirical studies to verify which dimensions of organizational practices and values have the maximum influence on real safety overall performance. Safety climate can be regarded as an element of the safety culture, or a demonstration of the actual utility of the safety culture (Lee and Harrison, 2000). The safety climate has additionally been taken into consideration an element of the overall safety culture in the enterprise (Cooper, 2000, Neal, et.al, 2000). The safety climate has also been conceptualized as an element of the safety culture with the two terminologies having to be considered alternate phrases (Glendon and Stanton, 2000). Rundmo (2000) have studied on approaches to growing a safety culture via safety climate measures encompassing safety attitudes, risk belief, and behaviors; yet, their model's linkage to actual safety performance signs is doubtful (Hale, 2000). Guldenmund (2007) stated that the safety climate and culture are not separate subjects, however they're awesome processes for securing shared objectives within establishments. There are conceptual ambiguities in the safety

climate literature which need to be clarified. As obtrusive in numerous previous research (see, e.g. Cox & Cheyne, 2000; Flin et al., 2000; Glendon & Stanton, 2000; Glendon, 2008), many variables are commonly discovered in each organizational safety climate and culture measurements.

There have been a whole lot cognizance on methodological problems in place of its theoretical or conceptual issues (see e.g. Høivik et al. 2009; Bosak et al., 2013; Mihajlovic, 2013; Dahl & Olsen, 2013; Hystad et al., 2014; Rémi et al., 2015; Kvalheim & Dahl, 2016; Bayire, 2016). Safety climate is the shared perceptions of the personnel on safety regulations, techniques and practices on the work environment (Zohar, 2003; Brondino et al., 2012). Safety climate is defined as a “snapshots” of safety culture at a particular time (Flin et al., 2000). In line with Andreas et al. (2016), climate emanates from psychometric culture, even as culture originates from the sociological and anthropological way of life. Safety climate is noticed to have been positioned as a resilient predictor of organizational safety performance (Cooper & Phillips, 2004; Andreas et al., 2016; Griffin & Curcuruto, 2016; Huang et al. 2017). To keep away from injuries from occurring, one important method is to be frequently vigilant thru using indicators (Øien et al., 2011). Safety indicators are advanced specially screening the level of safety in a system, to inspire action, and to provide the important facts for decision-makers about where and the way to act (Skogdalen et al., 2011). Occupational injuries descriptions are summarized as slips, trips, slides and falls (Skogdalen et al., 2011). Major accidents are “detrimental occasions such as major leaks/releases, fires, explosions or lack of structural integrity, leading to multiple deaths and/or most important harm to the surroundings or assets” (Amyotte et al., 2016, p. 1).

There are commonplace traits associated with primary accident instances: they have extraordinarily low frequencies, but extremely intense results (Amyotte et al., 2016); their occurrences have been now not due to unknown physical or chemical process dangers, however in all instances the dangers had been recognized for a long time; why they hold to arise are particularly characterized with the aid of management satisfactory, organizational and human factors (Knegtering & Paman, 2009). A few research (see, e.g. Antonsen, 2009; Kvalheim et al., 2016) has criticized the lack of capability of safety climate rankings to predict primary injuries. The link among safety climate signs and symptoms and fundamental accidents have been poorly investigated in the literature (Horbah, et al., 2017). Contrarily, in the work of Payne et al. (2010), which investigated the lagging and main effects of safety climate assessment on the primary accident threat resultantly confirmed that safety climate perceptions had been vital predictors of crucial twist of fate in a chemical approach enterprise. The works of Vinnem et al. (2010) and Kongsvik et al. (2011) on hydrocarbon leak analysis, safety climate results have been discovered to be a leading indicator for most important accident dangers.

VI. IMPORTANCE OF SAFETY CULTURE IN AN ORGANIZATION

In nearly every type of risky work, it is feasible to come to be aware about everyday accident patterns, because of this, the relevance of safety culture to secure operation is consequently now not disputed (Cox & Flin, 1998). It is very hard to construct a safety culture on diverse workforce within a corporation, however, agencies with top safety cultures have personnel who behave undoubtedly in the direction of safety practices. Most literature famous that a solid organizational way of life automatically promotes a solid safety culture and for that matter variety, if the organizational culture isn't strong it's going to no longer promote the anticipated safety culture and as such, that culture have to be changed (Armstrong et al., 2005). It could then be concluded that, efforts to enhance occupational health and safety overall performance will not be effective till the occupational safety and culture is stepped forward (Misnan et al., 2006). In keeping with Ankrah et al., (2009) safety culture has an extensive influence at the safety of enterprise operations. It was additionally opined via Atak and Kingma, (2011) that, safety culture is one of the vital component that has the propensity to negatively affect the safety of personnel and end customers of the products or services from enterprise. In an business company, wherein teams sooner or later are taken into consideration temporary institutions, safety situations impact organizational increase and improvement; for this reason safety culture would require good enough attention (Fang and Wu, 2013; Abdelhamid and Everett, 2000).

In line with Amponsah-Tawiah and Dartey-Baah (2011), fitness at work and healthful work environments are some of the maximum precious property of humans, agencies and country. There may be no doubt that commercial enterprise safety is a crucial trouble for managers as it has implications for value delivery, production, organizational image and social obligation. As a result, minor accidents and accidents can keep away from manufacturing in lots of various strategies and an extreme coincidence should bypass an extended way to close down the complete operations of the business enterprise. In this case, it is applicable to take questions about the motives of place of work injuries and accidents with all seriousness. In sight of this, Cullen (1990) said how important it is to create an organizational culture in which safety can be understood and also be well-known as the number one precedence.

Moreover, Glendon et al., (1995) commented that companies need to have mechanisms in place to gather safety-associated data, measure safety performance and prepare employees to discover ways to work extra correctly. Arguably, it could additionally be recommended that, an employer which practices top safety culture is more likely to save a good deal money in comparison to the most effective, which does no longer exercise safety culture or does now not deliver it with much interest; as such its resources could not be spent on injured employees in addition to changing damaged machines and device. In view of this, Smallman and John (2001) additionally in a look at suggested commercial enterprise leaders and companies to view occupational safety as an important concept and moreover to peer its potential effect on corporate reputation and income either negatively or

positively. The study also found out that, a poor safety report could probably harm the organization's image, in that it may result in one or more stakeholder viewing the business enterprise negatively. Furthermore, no employer would need to spend almost all of its sources on employees who get injured at work all the time because of terrible safety practice. Consequently, management of corporations has to make sure that proper safety measures are put in place and adhered to strictly by personnel so that you can preserve its reputation earlier than its stakeholders (Wright, 1998).

VII. SAFETY AT THE WORKPLACE

MANAGEMENT CONCERNS ON SAFETY

A study by Thompson *et al.*, (1998) states that through inadvertent means such as forming safety policies and procedures and setting production goals, senior managers support safety. They also emphasize that, beyond serving as a connection between management and shop floors, supervisors also monitor employee compliance to safety and give feedback to employees concerning their behavior. Within the twenty first century, achieving effective safety management entails placing emphasis on human factors as system components capable of causing or avoiding dangerous system just as technical components. Through this, organizations with highly reliable systems are able to discover and resolve potential hazards before they manifest as major accidents. To holistically ascertain safety culture, organizations must adopt and implement mechanisms such as audit, peer reviews, tour and performance indicator measures. (Lee and Harrison, 2000). Toellner (2001) added that, it is only when much focus is placed on the most significant hazards, that management tours are most effective. Additionally, sufficient time should be spent engaging employees and requesting for their involvement in generating solutions to hazards.

According to Lee and Harrison (2000), team briefings including discussions of safety had positive correlation to the attitudes of staff towards safety. Safety culture is therefore the responsibility of each employee and not just the responsibility of management of an organization. Each member is responsible for ensuring and adhering to safety measures at work (Stewart 2002). Lee and Harrison (2000) also tested respondents' perceptions of ways management deals with safety recommendations. Through their study, they discovered that while 50% of respondents claimed to have had suggestions acted upon by management, 22% of respondents either had had suggestions ignored or claimed they did not realize how to make suggestions.

EMPLOYEE CONCERNS FOR SAFETY

To create a culture of safety implies an organization's staff are regularly privy to hazards within the workplace including those they invent themselves. Given the possibility that employees could be the worst offenders of unsafe culture, it is necessary to use training to change such unsafe behaviours (Dickety *et al.*, 2002). Lingard and colleagues (2009), state that within the construction industry, supervisors,

managers and workers are all responsible for the implementation of safety initiatives. Guldenmund, (2000), Flin *et al.*, (2000), Cox and Cox (1991), cited in Cheyne *et al.*, (1998) suggested that employee attitudes are among the central safety culture measures. Moreover, Cooper (2000) also submitted that, safety culture affects the attitudes and beliefs of employees in terms of safety performance.

SAFETY TRAINING FOR EMPLOYEES

Harvey, Bolam, Gregory, & Erdos (2001) established that providing a one-day training session with the aim of increasing general awareness of safety issues and behaviors followed by the development of the improvement plan and participation in the action recommended brought enhancement in safety climate, but only in the group of higher-grade employees. Lu and Shang (2005) confirms that the perception of having a lot of safety training correlates with high scores in the safety climate scale. These outcomes are consistent with the findings of Lawrie *et al.*, (2006), who provided proof that training is an element of a company's safety culture. In line with Fernandes-Muniz *et al.* (2007), a company has a positive safety culture if it has safety management system entailing one of the most serious elements of that system, which is training and the quality of its delivery. It was proved by Diaz-Cabrera *et al.* (2007) that training is a part of safety culture and refers to the perception of employees of the type of training organized by an employer. Although a variety of training types could be considered, a training that is based on employee's roles played on safety is very significant (Bell & Kozlowski, 2008). Mullen and Kelloway (2009) advise that, safety culture interventions can be enhanced through providing training to senior leaders in transformational leadership. The duo also discovered that, groups of managers who go through transformational leadership training experience substantial improvement in safety climate perception.

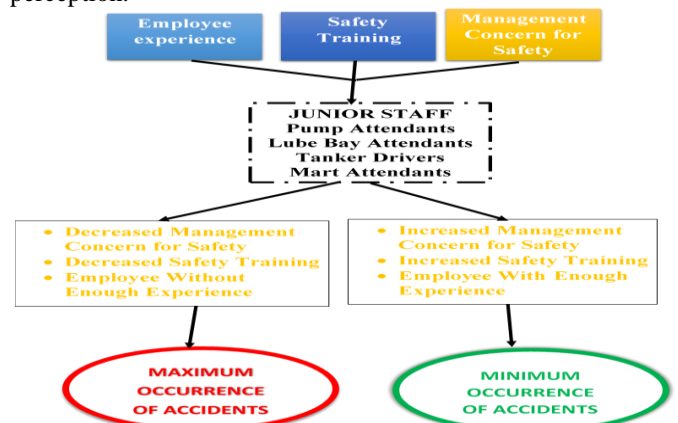


Figure 1: Proposed Frame Work for Management

VIII. CONCLUSION

- ✓ People's attitude, ideologies, values, customs and beliefs can affect the safety culture of an organization and can influence accident occurrence.

- ✓ Safety culture involves the organizations culture and the safety conducts of all employees in the organization.
- ✓ There is no widely accepted definition for safety culture however, it can be applied successfully if employers get to know their employees well.
- ✓ Management or leadership have a responsibility for forming safety policies and procedures and setting production goals if an organization can experience a good safety culture.
- ✓ Safety culture of an organization has influence on the occurrence of accidents.
- ✓ Providing industry training on safety helps reduce the occurrence of accident at the work place.

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