The Struggle to Protect the Worker: Safety and Security – Enemies or Friends?

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ABSTRACT

Preventing hurt to workers, organizations and the environment has been the concern of organizational leaders for years. Part of the strategies to address this concern is the implementation of safety and security management systems. While safety management system typically focusses on preventing harm from erroneous and unintended actions and inactions of organizational workers and management, security management system tries to address exposure to harm from deliberate and malicious actions of workers and personnel external to the organization. While both safety and security management system complement each other in preventing harm from internal and external activities, there are some areas of conflict between both. In such areas, implementation of safety requirements becomes counter-productive to security requirements and vice versa. The challenge is that in many instances, safety and security are treated as independent concepts and managed by separate processes and guidelines. This study was carried out through the critical review of relevant literature on the studies done on the interaction between safety and security in different organizations. The study recommends a deviation from the practice of treating safety and security as independent concepts and proposes the integration of safety and security management systems to enhance effectiveness and efficiency. Achieving that will, however, require a redefined risk assessment methodology that addresses both the concept of safety and security, training of safety professional in security procedures and training of security professionals in safety procedures, deployment of integrated health, safety, security and environment (HSSE) management systems and polices, and review of organizational structure to enable safety and security decision by common authority. As part of awareness and enhancement of safety and security advocacy, the study recommends inclusion of safety and security in secondary school curriculum and a cultural shift in understanding of how safety and security adversely impact each other.

Keywords: Safety, security, risk assessment, management system, matrix

INTRODUCTION

Safety and security are key challenges in many organizations and have been harnessed as integral aspect of a typical integrated health, safety and environment management system [1, 2]. According to [3], the essence of safety and security systems in an organization is to keep the risk to the public and the environment as low as reasonably practicable to prevent safety or security incident. As [4] (p. 98) noted, "Security incidents have dramatic short- and long-term effects on the workplace. Physical injuries and life loss have a direct and immediate impact on day-to-day operations of the organization. Psychosocial issues can have a short, as well as a long-term impact on the organization. Post-traumatic stress disorder (PTSD), depression and other stress-related diseases affect the workplace in an organizational manner as well as leading to financial implications. Stress-related diseases in the workplace have a direct cost to the social insurance system."

Though one may consider feeling safe and feeling secure as similar, the concepts of safety and security are different [5] though [6] noted that the distinctions between both as well as between scientific approaches and management strategies are blurred in both theory and practices. However, as [6] observed, both safety and security have developed in different ways and are supported by quite separate scientific and technological fields.

It is common knowledge that organizations owe their workers the morale duty of care. The need to enhance optimum productivity and organizational profitability, compliance with laws and harmony between organizations and the communities they operate have made safety paramount. With increasing societal unrest, crime rates, cyber-attacks, intrusions, bomb threats, vandalization, kidnapping, rascalization and similar crimes, security has become a growing concern for both organizations and the workforce. The implication is the need for alignment between both safety and security concepts to drive a safer and more secure organizations and workforce [6]. However, while the goal of safety and security managements systems are ultimately for the good of organizations and the workforce, there are high conflicts between the protocols for each, hence the need for coordinated implementation for optimum benefit.

A. Safety as Organizational Concern

Safety has been a top concern in many organizations [7]. The increasing number of catastrophic incidents over the years such as Piper Alpha incidents, Deepwater Horizon oil spill and the Chernobyl disaster have raised the focus on safety and the potential exposures associated with human error [7, 8]. The learnings from these incidents show that safety incidents are typically not the products of a single misstep but the consequence of multiple failures, faulty systems, and deficiencies in safety management systems [9].

With increase in technological innovations, there is growing concern about safety particularly with the advent of hazardous technologies and activities [7]. The concerns span many sectors of human endeavors such as energy, oil and gas, chemical and petrochemical, transportation, hydro systems, process control systems and communications network [6]. The concerns include potentials in relation to immediate and remote adverse exposures to personnel, inadequate preventive processes and human vulnerabilities. That has made safety, I many organizations, a core concept in policy, regulation and management [7].

As [6] posited, from the 1980s, supported by an increased understanding of how and why accidents happen, there has been increased attention on how accidents and disasters happen and what actions need to be taken to prevent recurrence. Many researchers have shown how hazards relate to changing organizational characteristics, and the argument that major accidents are unavoidable in certain high-risk operations has become a point of concern instigating interest in identifying the limits to safety and options organizations can explore to eliminate or mitigate hurt to personnel, equipment and environment [6, 10].

B. Security, an Emerging Organizational Challenge

There are varying perspectives on the concept of security [11]. Typical considerations, as [11] shared, include the state of being free from danger or threat, the state of feeling safe and free from fear, and measures taken, or procedures followed to ensure organizations are secure. The implication is that security in some context is used to describe the condition of an individual worker or that of a group of workers or organizations and the perception of the effectiveness of measures taken to ensure a secure condition is achieved. According to [12], security is the condition of feeling or being safe from threats or perception of a condition of threat.

Before the Cold War, security was mostly linked to state security and the protection against foreign threats [6]. However, with the end of the Cold War in late 1980s, there was increased consciousness on organization's vulnerabilities to malicious acts such as sabotage, intrusion, terrorism, cyber-attack [4, 13] and radicalization due to religious, political or economic reasons [4]. The 11th September 2011 attack of the world trade center heightened security awareness and increased the consciousness of inclusion of security as part of organization's health, safety and environment management system and regulatory framework [3, 4, 14]. Thereafter, the consciousness on need for effective security program has continued to increase as the public feels a form of uncertainty amplified by potential for terrorist attacks [13].

The implication is the introduction of new public policy and organizational programs and management systems to ensure not just the safety of workers, but also the security of personnel, assets, infrastructures and environment that organizations operate. Equally key is the understanding that ineffective security management system may exposed organizations to safety incidents [4, 15]. For instance, cyberattack on a process plant may result in lost of process control system that may escalate to uncontrolled release of toxic or hazardous chemicals with implications for multiple fatality, property damage and environmental pollution [4, 16, 17].

METHODOLOGY

The study adopted critical review of literature on different studies done on the interaction between safety and security in different organizations. This design was adopted because it provided a holistic platform to enable effective comparison of how safety and security complement each other and how they adversely impact each other as instruments used to protect workers and prevent loss in organizations. The literature reviewed were retrieved from different research databases and searches across the internet.

Analysis of data was done by comparing and contrasting the major themes obtained through the critical review of literature. No private data was collected during the critical review of literature, hence no ethical concerns for the study

RESULTS

The study identified major themes and similarities and differences in the approaches utilized by different organizations to manage safety and security – see table 1.

Table 1: Comparison of Safety and Security Protocols

Themes	Safety	Security
Information Sharing	Mostly open access	Classified
Incident investigation	Mostly open access	Confidential
Source of threat	Internal	Internal and external
Type of harm	Unintentional acts, errors, mistakes	Intentional, malicious acts
Management Strategies	Mostly general	Contextual, specific
Evolution rate	Slow	Fast
Predictability	High	Low
Philosophical paradigm	Communitarianism, utilitarianism and consequentialism	Deontological, Kantian theories
Responsibility	Organizational	Government
Threat Type	Internal to external	External to internal
Movement	Unrestrictive	Restrictive

DISCUSSION OF RESULTS

A. The Friendship Between Safety and Security

Safety engineering and security play complementary roles though each is realized through different techniques, risk assessment methods and cultural approaches [18]. In the context of security being seen as the state of feeling safe, safety and security can loosely be used interchangeably [11]. Similarly, as [15] observed, the

notions of safety and security can be used interchangeably since security mishaps often result in safety risks and vice versa. However, it may be challenging to merge all concepts of safety into the umbrella of security and vice versa without misconstruing the essence of each. With increased threats that organizations face such as cyber-attack, kidnapping, active shooting, intrusion, radicalization etc., it has become obvious that safety precautions are not enough to guarantee zero harm at work. The implication is that since existing safety precautions were not adapted to handle security issues, introduction of security procedures became necessary to ensure that while safety management system provides the structure and framework to prevent the workers from exposure to injury or hurt as a product of the unintended consequences of his or her activities, mistakes, complacency, limited training etc., there are also security procedures to protect the workers from the malicious action of others within or outside the organizations. As [6] noted, the increasing emphasis on security and associated security risk reduction measures led to an obvious intersection between safety and security management system in organization.

According to [4] (p. 97),

"These emerging risks have an impact on infrastructure as well as the occupational environment and the employee. At the same time, safety-related issues have been highly affected by the still ongoing economic slowdown and its byproducts (increased occupational psychosocial issues). Safety in the occupational environment, safety systems and competent authorities are victims of austerity measures, associated with the financial crisis. Financial uncertainty, increased security-related media hysteria results to yet more psychosocial issues."

A point of alignment is that both safe and security management protocols play complementary roles aimed at protecting workers, organization's assets, and the environment an organization operates from harm. As [4] noted, emerging threats such as cybersecurity, psychosocial risks, critical infrastructure protection and radicalization can be the links between security and safety. However, there is the need for empirical analysis to establish causal connections and how these factors impact safety and security of the individual worker and by extension, the organization [4]. While safety procedures protect the workers, organizations and environment from harm from activities internal to an organization, security procedures protect the workers, organizations and the environment from harm from activities external to an organization [6].

Reference [15] cited safety as the state that an individual worker is free from threats and considered security from the perspective of collective freedom from threats. While safety management system aims to identify and manage activities to prevent harm from unintended acts, omissions or commission of organization's workers, security management system aims at protecting an organization and the workers from the malicious and intentional but harmful acts of people especially outside the organization [15]. Through effective friendship between safety and security, an organization can be protected from both internal and external harm and damage from unintentional and intentional activities. Also, the bond between the organization and the environment it operates can be strengthened as safety will protect the environment from the activities of the organization while security protocols will protect the organization from undesired intrusions from the environment [6, 19].

B. The Enmity Between Safety and Security

Though safety and security are complementary in some contexts, there are areas of conflict between both [18]. While safety and security procedures aim to protect the worker, organizational assets and the operating environment, safety procedures are generally targeted at hazards and non-intentional or accidental risks as opposed to security procedures that focuses on malicious threats and intentional risks [20, 21]. Looking from another context, safety focusses on the tendency of the activities of an organization not to harm the environment while security focusses on the tendency of the environment not to harm the organization [22]. Unfortunately, there are limited models that enable balancing the interrelationship between safety and security control measures. The implication is that decision makers typically make an unenviable choice of sacrificing safety for security and vice versa [14]. There is, however, concerns by some researchers for further refinements in the perception of safety and security, particularly on account of the differences in how the terminologies are used in different contexts to drive the general prevention of harms to organizations and environments

irrespective of sources and intents [23].

The introduction of security management system has been a source of paradigm change in organizations in terms of risk management strategies as leaders had to understand and include a new category of threats in their risk identification, evaluation and management programs to ensure that outside safety incidents, security threats are understood and managed. This new trend required a new form of training and revision to existing risk analysis and management strategies. As [19] pointed out, the interactions between safety and security emerged as not all obvious, especially in normal situations though there is mutual influence between both. The implication, as [3, 11, 18, 19, 24] shared is that safety and security practices, in some instances, conflict with one another creating the concern, in many organizations, whether to have two separate management systems for safety and security or integrate both into a common management system. In many instances, the implementation of safety protocol may translate to outright violation of security procedure [2]. The reverse is also true. For instance, while safety procedures require emergency exits to be unobstructed, easy to access and operate, security protocols, in many organizations require exits (including emergency exist) to be secured and bolted when not in use and difficult to operate as a strategy to deter potential intruders and delay penetration during attack. While typical safety emergency response involves escaping from confined areas to muster area, normally open, typical security emergency response involves moving from open areas to safe havens, normally confined. Also, while safety procedures require the use of seat belts while driving as a form of restraint during accidents to mitigate safety exposures, typical security protocols may require removal of restraints while driving to enable easy escape or reaction in case of external attack. In a typical organizational setting, such misalignment between safety and security demands may lead to confusion and avoidable rivalry between safety and security professionals.

Another area of conflict is in the management of safety and security data, reports and information [24]. While safety may demand clear communication of observation to the workforce and transparency in handling safety concerns, certain security reports and investigation may require confidentiality [24]. While openness in sharing safety information helps in implementation of timely corrective actions, openness in managing security reports and investigations may adversely impact proactive action plan to prevent or address security issues. The implication is the need for varying strategies in managing both safety and security issues [24].

Ideologically, [15] identified conflict between safety and security. As [15] (p. 8) noted,

"Security and safety on the one hand and liberties on the other are generally conceived of as very different types of values or even as incompatible concepts, due to the fact that they fit better with different moral outlooks: safety and security seem to be more related to outlooks that warm to collectivity, e.g., communitarianism, utilitarianism and consequentialism, whereas rights of the individual are closer to outlooks in which the individual is key, such as in deontological, Kantian theories. The problem of these moral outlooks is that they may be overlapping and reconcilable to a large degree, but not completely. In the end, they rest on irreconcilable normative views of the relationship between individuals and minorities on the one hand, and majorities and society as a whole, on the other. Many of us nowadays are – mostly unwittingly – ethical eclectics reasoning now with deontological premises, then with utilitarian ones, and then again with communitarian ones. In terms of information transmission and management, safety encourages simplified strategy – making safety information readily available and sometimes adopting the approach that even a lay man can follow - whereas security, in some context, encourages complicated approach. In that wise, security protocols may be encrypted, and information protected through multiple layers of security barriers which may be physical or complex passwords."

Technologically, safety and security can be viewed from different paradigms. As dynamic as technology is, safety procedures do not change at alarming rate compared to security protocols. Due to emerging security threats, security requires continuous monitoring and adaption of existing protocols to enable effective response to emerging threats. The implication is that unlike safety procedures, security procedures are more dynamic and so requires more regular trainings to address any emerging threats. Unlike safety, effective management of security issues involves dealing with confidentiality, integrity and availability [1]. As [1} described, confidentiality deals with the ability to protect data against unauthorized users and processes while integrity

focusses on the ability to protect data from improper system modification. Availability is concerned with the system's ability to deliver services when requested [1]. The bridge of any of confidentiality, integrity or availability can pose security threat.

Another fundamental contrast between safety and security is in ownership and stewardship. While organizations have legal requirement for establishment, ownership and stewardship of safety requirements, the provision of security is mostly the responsibility of government [4]. This limits organizations' capacity to ensure a secure workplace as they have limited authority to establish and steward security requirements despite the huge impact on strategic priorities and organizational development [4].

An additional disparity in managing safety vs security is in the area of risk assessment. While both safety and security risk assessments focus on what may likely go wrong and attempting to quantify or qualify the impact, safety risk evaluation utilizes fixed or relatively static knowledge of the technique architecture such as hazard and operability study (HAZOP), fault tree analysis (FTA) and failure modes and effects analysis (FMEA) [16]. On the other hand, security risk evaluation typically takes into consideration possible change in system architecture, emerging technologies and introduction of malicious code. Invariably, the considerations during security risk assessment are more dynamic and so not suited for a typical safety risk assessment scenario.

C. Defining a Middle Point

Recognizing that both safety and security management systems aim to address harm and both are required, a point of interest is what needs to be done differently to improve the deployment of safety and security procedures even though there are separate entities to limit the risk of the dichotomy between both while dealing with dangers – those that make workers and organizations feel unsafe or insecure [25]. As [26] noted, there is increasing awareness that while safety and security may seem different, certain systems that are vulnerable to security attack may be susceptible to safety failures as a result of security breaches. The implication is that if it's not secure, it's not safe [2, 26], hence the need to eliminate the dichotomy between safety and security.

It is obvious that for effective and holistic risk management, safety and security do not need to be treated as two separated entities [3, 14, 17]. The potential conflict between safety and security could be narrowed to the problem of defining the difference between an accident and a criminal act [6] and being able to streamline preventive and mitigative procedures for both.

Safety and security professionals, therefore, can no longer ignore each other in either concepts, policy or management systems and practices as both systems are necessary to prevent hurt to personnel, loss or damage to organization's assets and adverse impact on the environment [3, 27]. Invariably, safety and security management systems should be integrated, areas of conflict identified, and common risk assessment done to recognize where safety procedures are more effective than security procedures and vice versa in the protection of workers, assets and environment [2, 17]. The integration, as [17] recommended, can be structural integration to increase compatibility of systems elements through adoption of similar standards or deployment of organization's policies. Another form of integration can be functional in which case core functions or coordination of generic safety and security processes are integrated into a common system [17]. Another approach to integration can be cultural integration which involves embedding safety and security management as part of a culture of learning and continuous improvements [17].

Reference [14] (p. 389) recommended that "To enable the integrated analysis of emerging security and classical safety-related risks in a holistic manner, safety and security co-analysis (SSCA) is highly demanded for accident prevention." SSCA entails integrated and holistic analysis of emerging security threats and classical safety-related risks to identify, assess and implement preventive and mitigative measures for accidents and incidents in complex organizational systems [14].

In the areas of conflict between safety and security, the focus should be to deploy the procedures, whether safety or security, that offer higher level of protection for personnel, assets and environment. Such approach

will require alignment between safety and security professionals and holistic approach to the drive for loss prevention [17].

While the option of holistic risk assessment seems to be the way forward, the challenge is that there is uncertainty on what to expect of such risk assessment strategy as most existing risk assessment templates and matrixes treat safety and security as different entities and contribute to the widening perception of both as separate entities thereby fostering the existing conflict between both [14]. Another challenge is that any methodology adopted to enable alignment between the concepts of safety and security should have the capacity to handle the increasing conceptual differences between safety and security particularly with increase in the application of science and deployment of technology to solve societal problems.

CONCLUSION

Safety and security management systems are necessary as part of the strategy to protect workers, organization's asset and the operating environment. However, there are areas of conflicts between both concepts leading to the implementation of one violating the requirements of the other. With increasing need for both concepts, there is need for renewed alignment to positively reinforce areas of common interest while addressing potential areas of conflict. The goal should be to align safety with security such that both concepts complement, rather than contradict, each other and offer increased protection for the worker, organization and environment.

RECOMMENDATIONS

As part of effort to improve loss prevention through alignment of safety and security procedures, the following are recommended:

1.) Creation of redefined risk matrixes that address both the concept of safety and security and enable decision making and prioritization of actions based on what offers higher value.

2.) Training of safety professional in security procedures and training of security professionals in safety procedures to enhance clearer understating of the principles of each and improve in managing areas of potential conflict.

3.) In organizations where safety and security are already integrated in a common management system, there is the need to enhance existing training programs to deepen understanding on how to conceptually and in practice deal with the expanded scope of responsibility fr effective management of safety vs security.

4.) Deployment of integrated health, safety, security and environment management systems and polices that mandate shared resources, responsibilities and stewardship between health, safety, security and environmental requirements.

5.) Review of organizational structure to enable decision by common authority where there are conflicts between safety and security requirements.

6.) Sustained awareness among the workforce and organizational leaders on effective stewardship of safety vs security requirements and clarification of typical contexts where one has to be preferred to the other.

7.) Inclusion of safety and security as part of secondary school and tertiary education curriculum, irrespective of areas of specialization, to lay early and general foundation on both concepts among emerging youthful populations.

8.) Shift from mere focus on meeting safety and security needs as a legal requirement to considering in practice how each concept adversely impacts the other and defining organization-based strategies to mitigate any potential area of conflict between safety and security.

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