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Health and Safety Management Systems – A Comparative Analysis of Content and Impact

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Abstract

Health and safety management systems (HSMS) have become a popular topic as both OSHA and MSHA propose regulations on the subject and as ANSI Z10, OHSAS18001 and the National Mining Association's "CORE Safety" begin to take shape and are implemented. Previously, other management system-like processes have been implemented, such as OSHA's "Process Safety Management of Highly Hazardous Chemicals" (PSM) standard and the American Chemistry Council's "Responsible Care" process. But what is the difference between an HSMS vs. how health and safety has traditionally been managed for years, i.e. the "safety program"? Why do many now perceive management systems to be a better way to manage the health and safety business? How do we know that their content and the content mix are appropriate and that their implementation will be effective? Although "Responsible Care" has been around for over 25 years and the "OSHA PSM standard" for more than 20, the more recently developed health and safety management systems are relatively new. It is probably safe to say that they have not had enough of a chance to work for us to be able to prove that they accomplish our health and safety objectives or that if they do, to what extent (it can be assumed that "to work" means that their implementation will help us to prevent injuries). So, why are the regulators, consensus organizations and industry associations so actively getting behind this HSMS way of doing business? Why is there more than one HSMS out there and available?

Answers to the questions proposed are presented through comparative analysis, published, scientific literature, as well as the results of theoretical and empirical HSMS research conducted by NIOSH researchers. Through these studies we are able to glean information related to explain differences and similarities in content of various HSMS models and discuss the benefits and costs associated with their implementation. Based on the same sources of scientific information, the authors also discuss effectiveness measures associated with these management systems. It is expected that our readers, after reading this proceedings article, will better understand what HSMS are, how they are expected to work, and what the differences and similarities between various proposed HSMS. Readers should have an increased comfort level as to whether an HSMS is right for them and if so, which system is best. They will also understand which or how many of their current intervention activities are already part of a management system and how they can integrate those activities into their HSMS, should they choose to adopt one. Finally, readers will also have a better understanding of what system performance metrics are and how they can determine the effectiveness of their systems. In general, they will be better prepared to develop and implement an HSMS if they determine it is right for them.

Introduction

A system is a grouping of interrelated and often interdependent components that are brought together in nature or in the manufactured world to generate or achieve a common objective or perform a common function. There are many definitions for a system and there can also be many types of systems in both the natural and the manufactured world. Some common attributes that seem to be present in most definitions of a system are interrelatedness or interdependence of system components with and between each other and the notion of a common objective. An example of a system in nature would be a respiratory system. This system is made up of the trachea, the bronchioles, the lungs, the alveolar ducts, etc. These components all work together to oxygenate the blood and remove carbon dioxide from the blood. An example in the manufacturing world might be an electric power supply system that includes components such as power generation turbines, transmission lines, transformers, distribution lines, etc. These components work together with human intervention to bring electricity to customers to light and heat (or cool) their homes. Again, the keys are the common objective and interrelatedness or interdependence of the components with each other and the function or objective. In addition to this qualitative description, formal definitions can also be found in the published literature. Elsayed and Boucher (1994, p.1) define a production system as:

> *"a collection of material, labor, capital and knowledge that goes into the manufacture of a product. How this collection of components is put together in any specific situation defines the particular system."*

Another, more simplified definition of a system brought to us by Eisner (2002, p. 3) is:

> *"A system is any process that converts inputs to outputs."*

To take "system" one step further into a specific category, the concept of a management system can be considered. A management system may be described as a structure and set of processes, procedures, policies and/or actions that are implemented within an organization to achieve a defined objective or perform a common function in an efficient and structured way. An example of a man-made management system might be an accounting or finance system used by an organization to manage its revenue and debt. This system may integrate people, software and processes which work interdependently to identify, record, and track income, implement a billing process, and ensure payment of the organization's bills. It might include an investment component, a tax component and a debt management component. All components working together to ensure that the organization's financial goals are met. Another specific example of a management system might be a personal management system bringing together people and processes to recruit, hire and retain people so that the best talent is brought together and maintained to help ensure that the organization can achieve its business goals.

However, the current topic of interest involves the analysis of an even more specified system; the concept of an occupational health and safety management system. The American National Standards Institute (ANSI) defines, in their ANSI/AIHA Z10 standard titled Occupational Health and Safety Management System as "a set of interrelated elements that establish or support occupational health and safety policy and objectives, and mechanisms to achieve those objectives in order to improve occupational health and safety. (ANSI/AIHA Z10-2010) The British Standard, BS OHSAS 18001:2007, \and its guidelines for implementation, BS OHSAS 18002:2008 (Occupation Health and Safety Assessment Series for health and safety management systems), define an HSMS as "part of an organization's management system used to develop and implement its OH&S (Occupational Health and Safety) policy and manage its OH&S risks." There are also

three notes associated with the definition and they read: “Note 1 A management system is a set of interrelated elements used to establish a policy and objectives and to achieve those objectives” and “Note 2 A management system includes organizational structure, planning activities (including, for example, risk assessment and the setting of objectives), responsibilities, practices, procedures, processes and resources” and “Note 3 Adopted from ISO 14001: 2004”.

Management Systems Comparison

Interestingly, much similarity can be noted between the fundamental definition of a system, the concept of a management system, and provided definitions of an HSMS. The key similarities are; many components (or elements), interrelatedness, interdependence between elements and a common objective. Because health and safety (H&S) issues and H&S risks are comprised of complex physical, cognitive and/or behavioral phenomena that can originate from both the natural and the man-made world, acceptable mitigation of this complex risk, necessarily involves a proactive management system which. It is surmised that this is the reason HSMS have gotten so much recent attention.

In addition to the ANSI/AIHA Z10 and the BS OHSAS 18001:2007 standards there are other HSMS being proposed and adopted. For example, the American Chemistry Council established the Responsible Care initiative more than 25 years ago for its members (at that time the organization was known as the Chemical Manufacturer’s Association). This system goes beyond health and safety management as it also addresses product and environmental stewardship as well as security. Also for example, within the last year, the National Mining Association began implementation of its CORE-Safety HSMS. In addition, the H&S regulatory agencies (the Occupational Safety and Health Administration (OSHA) and the Mine Safety and Health Administration (MSHA)) have also been involved in the HSMS movement. Although original regulatory efforts which took place over decades ago resulted in voluntary guidelines, they currently exist in the form of proposed regulatory language. Public comment sessions have been held within the last two years on HSMS (for example, MSHA public comment meeting held in Birmingham, AL, 10 November 2011 and OSHA’s Draft Proposed Safety and Health Program Rule: 29 CFR 1900.1 - Docket No. S & H-0027). Interestingly and sometimes overlooked when considering HSMS, OSHA already has in effect an HSMS-like regulation in 29 CFR 1910.119 Process Safety Management of Highly Hazardous Chemicals.

While there are many different HSMSs available, there is much overlap between them. One might even say that because each is considered a performance standard and specific implementation is up to each implementer, that it would not matter which system an organization choses to implement. One can somewhat discern commonalities from seeing the element similarities as shown in a Table 2 comparison of several health and safety management systems. Table 1 below also shows the between system similarities with the more strategic-level attributes that are part of each system. While some of the titles of each system element may be slightly different, the authors in their quest to compare similar aspects of several systems, attempt to interpret the spirit and intent of each to identify these as similar expectations and function of each element.

In general, it can be said that all have a similar purpose, they are all performance based, and they all set standards and guidelines to help participating organizations achieve their health and safety objectives. As suggested above, most of the differences between the different management systems will likely not become apparent until individual organizations begin to implement, through its intervention actions, a particular element of the management system. For example, while most of the systems have an element titled employee participation, or similar, how each individual organization chooses to engage employees may be completely different. While one

organization may have employees in an advisory role and only serve to suggest revisions to safety and health policy, others may take a more hands-on approach and ask employees, for example, to make decisions on intervention priorities, to conduct risk analyses and/or to develop safe operating procedures. These implementation differences may result from the differences in leadership, and the level of its commitment, and from the type of organizational culture present. Only the NMA CORE Safety system includes an explicit element related to the assessment and continual improvement of safety culture as one of its elements. The importance of safety culture in HSMS implementation, however, is generally considered to be an important component because of the accompanying generalized trust and value congruence between organizations and their employees (Burns, Mearns, & McGeorge, 2006; Choudhry, Fang, & Mohamed, 2007) So, let us first look at the element level similarities. Tables 1 and 2 show which of the management systems includes each of the noted system elements.

HSMS Strategic Element	ANSI Z10-2010	OHSAS 18001:2007	NMA CORE Safety	Responsible Care	OSHA PSM
Policy	X	X	X	X	
Planning	X	X		X	
Management Leadership	X	X	X	X	
Resources, Roles and Responsibilities	X	X	X	X	X
Leadership Development	X	X	X		
Accountability and Authority		X	X	X	X
Assessment and Prioritization Objectives	X			X	X
Allocation of Resources	X		X		
Hierarchy of Controls	X		X		X
Definition of Legal Requirements		X	X		X
Implementation Plans	X	X	X	X	

Table 1: Comparison of Strategic Level Elements of HSMS across several available systems (*Source*: The regulatory and consensus standards reflected in this comparison)

HSMS Element	ANSI Z10-2010	OHSAS 18001	NMA CORE Safety	Responsible Care	OSHA PSM
Hazard Identification, Risk Assessment and Controls	X	X	X	X	X
Employee Participation	X	X			X
Management of Change	X	X	X		X
Education and Training	X	X	X		X
Incident Investigation	X	X	X	X	X
Audits	X	X	X	X	X
Contractor Safety	X	X	X	X	X
Emergency Preparedness	X	X	X	X	X
Management Review	X	X	X	X	
Document Control	X	X	X		X
Monitoring and Measurement	X	X	X	X	
Non-Conformity and Corrective Actions	X	X	X	X	X
Work Procedures and Permits		X	X	X	X
Operating Procedures	X	X			
Feedback and Planning Process	X			X	
Design Review	X	X	X	X	X
Cultural Enhancement			X		
Communication Process		X	X	X	
Occupational Health			X		
Behavior Optimization			X		
Mechanical Integrity		X			X

Table 2: Comparison of HSMS elements across several available systems (*Source*: the regulatory and consensus standards reflected in this comparison)

One can see that there is much consistency across the content of all the management systems used in this comparison. Given this consistency, it may be comforting to know that whichever system you determine to be right for your organization, it is difficult to go wrong in choosing one over another. The determination of which system you choose may depend, however, upon your particular industry. For example, NMA CORE targets the mining industry, Responsible Care targets the chemical manufacturing industry and OSHA PSM is a requirement

for the process industries. Implementation of Z10-2010 or BS OHSAS 18001:2007 is less restricted when considering specific industries.

The real challenge in HSMS implementation, however, will be in developing and implementing the specific interventions or program activities. Many traditional H&S program elements and intervention activities fit management system element expectations and their implementation, an organization may be considered as having "qualified" for covering that management system element. However, the meaning of "covering" may come under question upon further or deeper analysis. There is also question as to whether implementation of a particular element under the "traditional Health and Safety Management program" would have the same effect as if it were being implemented as part of an HSMS. The question is raised because it is not clear that the "traditional safety and health program" enjoys the same benefits of management support, employee ownership and participation, organizational culture conduciveness or the same level of organization and structure as an HSMS with a defined singular purpose or goal.

But when one is trying to develop and implement something new within an organization, a natural effort to categorize and use the existing and ongoing foundation or basic safety program activities as a starting point may be made. While there is comfort in the known, implementing a new management system will undoubtedly require some change in existing processes, some curtailing of other processes and some completely new processes. To help an organization begin this process, or at least begin to think about how this conversion would begin, table 3 below presents a listing of a small few of the common traditional H&S management program activities that may "qualify" as implementation interventions under an HSMS adoption. This list is by no means exhaustive and some may dispute the entries as traditional program activities; however, one may find comfort in knowing that to start to implement a particular new HSMS process one only has to begin by adding structure and tracking to existing processes. Care should be taken here though as there is much foundation building that also may be required up front if leadership support, ownership and commitment and employee ownership is not in place yet or if the organizational culture does not yet support the change. It is also important to note that each element and each activity is likely to interact with other elements and/or activities to hopefully enhance the benefit of both (or more) of the interacting elements (Haight, et al., 2001a).

Some example traditional health and safety program processes

New HSMS Elements	Hazard Analysis	Incident Invest.	Training and Dev.	Emergency Response	S&H Audits	Safety Meetings	Contractor Safety
Hazard Identification, Risk Assessment and Controls	X	X		X			
Employee Participation	X	X	X	X	X	X	X
Management of Change	X		X	X			
Education and Training			X			X	
Incident Investigation	X	X					
Audits					X		
Contractor Safety	X						X
Emergency Preparedness		X		X	X		
Management Review	X	X	X	X	X	X	X
Document Control	X	X	X	X	X	X	X
Monitoring and Measurement	X	X	X	X	X	X	X
Non-Conformity and Corrective Actions		X			X		
Work Procedures and Permits			X		X		
Operating Procedures			X				
Feedback and Planning Process	X	X	X	X	X	X	X
Design Review	X	X					
Cultural Enhancement					X	X	
Communication Process	X	X	X	X	X	X	X
Mechanical Integrity	X				X		

Table 3: Traditional health and safety processes and where they might fit in the new HSMS structure

While getting started may be made easier with the knowledge that some of what an organization is already doing forms beginnings of development and implementation of an HSMS, it is by no means, an easy process. A significant difference in how an HSMS is built and implemented from one organization to another may have little to do with the specific program elements or intervention activities and more to do with how they are implemented and with the leadership in charge of their implementation. HSMS implementation is more than just starting a new audit process or a new risk assessment process. An organization must have an organizational culture that supports both implementation of an HSMS and the long term maintenance of it. To aid in this evaluation and building process, one of the management systems, the NMS CORE Safety system, has a cultural enhancement element. Organizational culture attributes such as a

supportive management and a group of supportive employees who are interested in taking ownership of the new HSMS are critical system attributes that will go a long way towards helping the system to succeed. It is widely accepted that successful implementation also requires a committed management team and a well-thought out accountability system to ensure ongoing implementation even after everyone wants to allow the processes to wither (Johnson, 1973).

Important Differences to Consider

An important difference to discuss is an HSMS emphasis on system-wide record keeping, document control and integrated inter-element tracking of non-conformance. This element in particular can be argued to be an important difference that gives HSMS its system quality. When all procedures are produced with the same format and quality they provide a familiarity that lends itself to successful use of the procedures. When non-conformance records are kept in the same tracking system, even if they result from incident investigations, compliance audits, or preventive maintenance findings, they can be addressed with the same risk ranking process. This consistency allows for sound and cost effective risk reducing invention implementation consistent with the overall system objectives. Document control across all elements also ensures consistent updating that is reflected in up-to-date equipment specifications and inspection records, operating procedures, risk assessment results and non-conformance documentation. Although, these types of important activities may or may not have been a part of traditional safety programs, most likely, however, they were not previously integrated within the management structure.

Another difference to address is the structure of an HSMS over a virtually structure-less traditional program. The definition of responsibilities and accountabilities, the inter-element interdependence and non-conformance tracking, the system wide management reviews and the system wide risk assessments, resource allocation and investment decisions produce a much stronger potential to guarantee successful implementation and the subsequent realization of incident and injury objectives.

An important difference between the traditional program approach and that of the management systems identified above is that they all operate using a general Deming “Plan-Do-Check-Act” cycle. If one were to start in the order shown by that cycle….”to plan”, it is easy to recognize that there is much to do before any physical activity takes place in the form of an intervention. (Deming, 2000; Deming and Edwards, 1982) In the planning process, an organization would first have to develop the policy and set performance objectives as well as get employee and management buy in and employee ownership. Several of the HSMSs support elements around this planning stage, and this is one of the first places in the cycle where differences between safety and health programs and HSMSs emerge.

It is during the “Do” part of the cycle that intervention activity implementation happens. This is, for example, the safety and health training, inspections, preventive maintenance programs, safety meetings, awareness campaigns, behavioral safety observations, risk analyses, work permit programs, etc. How these are built and how they are implemented is critical. While some of the same physical and sometimes cognitive and behavioral activities happen, the differences in the who-and-how of the activities may be stark. Under the traditional safety program banner these activities may have been implemented individually, by different people, each with their own objectives. Implementation of the same activities within the framework of an organized system ensures a unified objective and complimentary (as opposed to competitive) functions. Here it is planned for each element to complement, interact with or depend on the proper implementation of each other. Within a system, the intervention activities are implemented such that their implementation and maintenance can be optimized in terms of

quality and amount of effort with the goal of optimizing the overall system's objective of reducing the number and/or severity of injuries and illnesses.

While one would see similar activities in a traditional safety program approach, the HSMS has, built into its structure, elements to address the "Check" and "Act" phases of the cycle as well. It is proposed that this structure then helps to ensure or at least improve the probability of success. A management reviews and proactive and reactive checking (e.g. audits, inspections, and investigations) elements contribute to the "Check" step. The "Act" step would be covered by elements related to corrective action. The entire structure and the continuous loop-continuous improvement nature of HSMS or any management system for that matter, also help to increase the likelihood of success.

While effectiveness measurement of HSMS will be addressed more in detail in the next section, it is proposed here that using a system-based approach to implement H&S interventions allows more effective measurement opportunity, which also yields advantages over the traditional program approach. In sum, the authors claim that the fundamental principles of a systems approach provide three significant benefits over and above a traditional safety program approach. The systems approach brings the attributes of *oneness of purpose* and *interdependence between system elements* and it creates a structure and a level of *organization* that we were unable to achieve with traditional safety program efforts. With these improvements we are able to benefit from a substantial increase in measurement accuracy and the ability to establish accountability, both of which increase the likelihood of organizational safety performance success. They also provide an opportunity to optimize the whole system such that efficiency can be improved by the big-picture implementation and quest to minimize incidents and injuries while concurrently minimizing resources and maximizing quality of implementation. (Haight et al., 2001b and Iyer et al. 2004)

System-Wide Intervention Effectiveness Measurement

Quantitative measurement of H&S program effectiveness has been a problem that has plagued the safety community for many years. Injury and illness prevention is the stated goal of most H&S programs, but if an injury or illness has been prevented by something done as a result of an H&S program, how would one know? We cannot really count things that don't happen? Even if we find that there was one fewer injury this year than last year, how do we know that the one fewer incident was due to chance or if it was not due to chance, how do we know that the health and safety program was responsible? For many years, safety professionals have measured the effectiveness of programs by the end of year incident rate and compared it to last year's rate or an average rate over some period of time. Part of the safety community has recognized that this process leads only to a yo-yo effect on the incident rates as more resources are allocated to injury prevention when the rate is high and fewer resources are allocated when the rate is low. They have recognized that it may not be enough to measure what is often referred to as "lagging indicators". This means that indicators of events that have already happened are used to manage efforts that are in the future….the measures "lag" behind the implementation of prevention efforts. Unfortunately, this has led to a movement towards measures referred to as "leading indicators" alone. Leading indicators reference the quality of certain H&S intervention's implantation. (Toellner, 2001, Haight and Thomas, 2003, Manuele, 2009 and Wachter, 2012) Leading indicators are touted by the H&S community as being an improved measure because they are proactive. They allow adjustments to be made to the program before an injury happens. However, neither of these approaches has proven to be true measures of performance. No one can truly say that any change in injury or incident rates is due to anything being done as part of the health and safety program. Using either leading or lagging indicators proves nothing of safety performance. It only provides by-chance, intermittent "feel-good sense of reason"-based

variation. (Shakioye and Haight, 2009) Much of the literature does not adequately address the interactive effects between performance variables and the cause and effect relationships between leading and lagging indicators.

The measurement difficulty presented by the systems-based approach that is not fully appreciated within the traditional approach is that the industrial community has determined that some of the driving forces for HSMS success may be considered by some to have arcane or esoteric characteristics. In other words, they are just difficult to measure. These system approach requirements or drivers are leadership or management commitment, employee ownership and an organizational culture that is conducive to successful and positive implementation of an HSMS. It has been written that there was a sign on the office door of Albert Einstein at Princeton that read "Not everything that counts can be counted, and not everything that can be counted counts". One could surmise that he ascribed to that philosophy and it is this very philosophy that defines the difficulty with measuring the effectiveness of HSMS. Given this, there are many non-quantitative techniques that can be used to assess the effectiveness or the contribution of the more arcane elements of an HSMS. There are surveys that can measure the level of or presence of these drivers and there may even be experienced professionals that an offer their opinion that high levels of these elements are present, however, it is not easy or even possible sometimes to define or present a number that represents a conducive organizational culture, a committed leader, or an employee who feels ownership over aspects of HSMS. What is required here is to measure or describe qualitatively, existing levels of the defining characteristics of leadership, ownership and organizational culture, i.e., show some measure or index of their levels that will allow comparison of those levels to system outputs over time and/or to compare those levels to the experience of other organizations (similar and non-similar) to establish baseline measures. At that point, continuous measurement of those values over time can yield some sense of improvement…..or some sense that improvement is not happening.

Another benefit that an HSMS provides to the measurement problem is the fact that it promotes a risk-based approach to implementation. When an organization is able to define its baseline operating risk and then establish a level of risk that it is willing and able to tolerate, it has its basis to compare against different levels of quantity and quality of implementation across the whole system on an instantaneous and longitudinal basis. While risk itself is not a straight forward mathematically quantitative measure, its indexing quality does provide a means to perform relative ranking of intervention options or levels or quality of implementation of interventions with a consistent measure. It is semi-quantitative at best, but because of its consistency quality, it provides a means and a measure to make decisions around the levels associated with investment, amount and quality of effort, adequacy of the performance as well as the overall direction the system should take.

Health and safety management systems do, however, provide an opportunity for true H&S intervention effectiveness measurement. Research has been scratching at the surface of true, statistically significant measures of performance for the last 12 years. Haight, et al. (2001 a and b), Haight and Thomas, (2003), Iyer, Haight, del Castillo, Tink, and Hawkins, (2004) and Iyer, et al. (2005) determined that in order to truly measure H&S intervention effectiveness, one has to establish the mathematical relationship between the leading indicators and lagging indicators. This way, there is a chance that we can begin to understand and explain any variation in injury rates. This also necessarily provides measurement of the interactive effects between performance variables. Haight, et al. (2001 a) was the first to establish this mathematical relationship and there has been much work since then to make some sense out of and use this mathematical relationship. As with any input/output model, the resulting mathematical function provides an opportunity to explain, in model form, a real system as it operates. Care should be taken here however, as mathematical model contain some margin of error….but some of them can be useful as decision-making tools, provided uncertainty in the results can be minimized. In general, in

research, one tries to minimize uncertainty by increasing the number of samples, however the level of uncertainty in the results may not be helped with additional samples if the variation in the system is great. The level of certainty can refer to the amount of variation that one is able to explain through the experimentation and subsequent modeling. If the incident rate, for example does not respond to a change in the amount or quality of implementation of one or more of the HSMS element interventions, the variation or lack thereof in the output may not be able to be explained with acceptable certainty. With any human based system, uncertainty in the results will be higher than when analyzing a system driven by the more predictable natural and physical laws. However, without data collection, experimentation, analysis and modeling, the level of certainty around any decision made about the performance of the system is zero. The results of the more recent research in this area of health and safety management systems have shown that the level of uncertainty has been reduced to roughly 30%. (Al-Mutairi and Haight, 2009, Shakioye and Haight, 2009 and Oyewole, Haight, Freivalds, Cannon and Rothrock, 2010)

The research of Shakioye et al. (2009) and Oyewole, et al. (2010) have yielded some interesting results. Shakioye et al. (2009) showed, through extensive operations research methodology that the incident rates predicted by his mathematical model representing the effectiveness of the health and safety system were predictable. This is shown in figure 1 below.

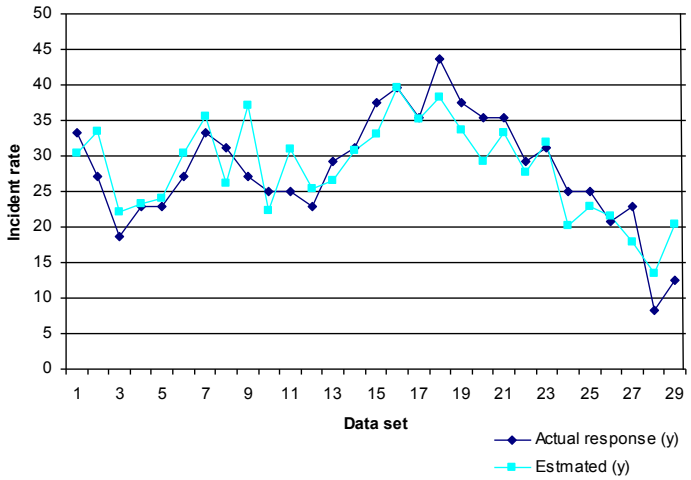

Figure 1: Actual incident rates versus model generated estimation of the incident rates. (Adapted from Shakioye and Haight, 2009)

Oyewole et al. (2010) took the earlier operations research methodology based work a step further by using response surface methodologies. He also treated the interactive effects between intervention activities more thoroughly than the previous researchers. The limitation here is in the difficulty of making a five dimensional model a three dimensional model so that it could be shown graphically. From figures 2 and 3, we can see from the 3D surface that the incident rate responds to the interactive effect of two variables from the HSMS being studied. We can then take this information and make adjustments to the implementation of variables "C" and "E" of this particular HSMS so that we can attempt to minimize the incident rate. The same model information is presented in two ways to allow better visualization of the model results. From figure 3, one can discern that the minimized incident rate is achieved at the indexed value of the implementation quality or quantity of the two subject variables to be at approximately level 2.5 for variable C and level 6 for variable E.

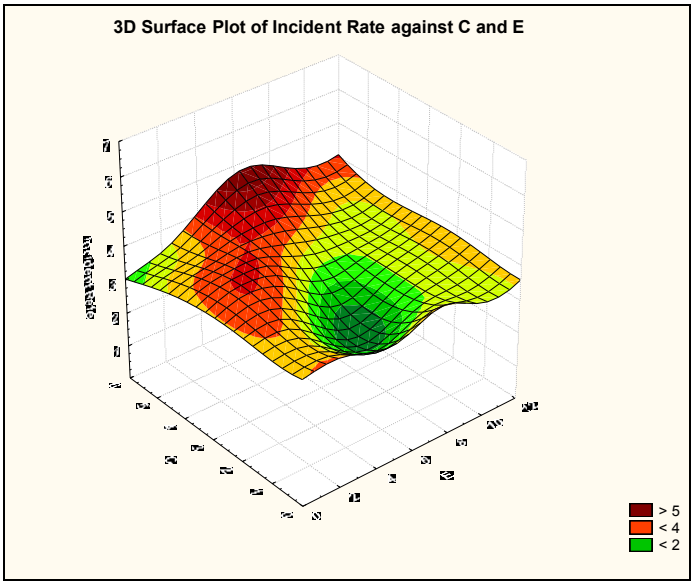

Figure 2: Response Surface Plot of Incident Rate vs. HSMS variables C and E (Adapted from the Ph.D. dissertation of Oyewole, 2010)

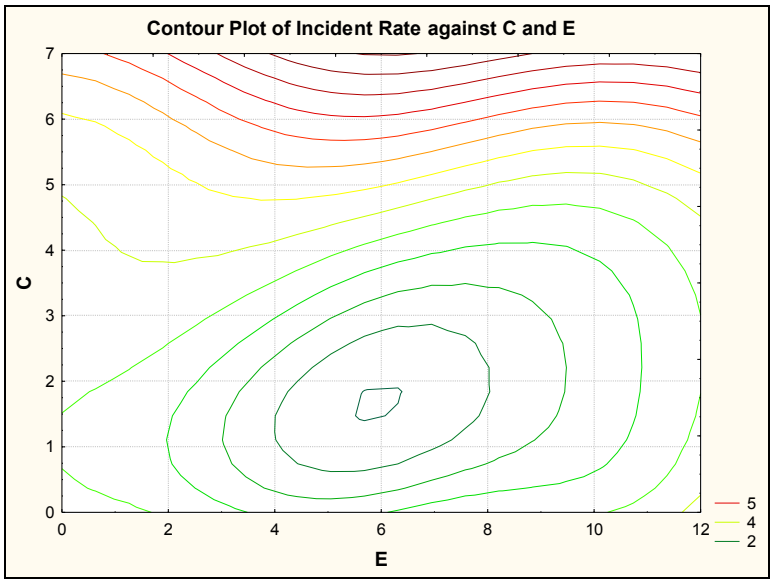

Figure 3: Contour Plot of Incident Rate vs. HSMS variables C and E (Adapted from the Ph.D. dissertation of Oyewole, 2010)

This information should not be construed as THE answer to the safety problem, but only an answer that suggests certain adjustments that can be made to the HSMS implementation and only with roughly 70% certainty. It is encouraging work and as is, can be a tremendous benefit to those charged with successful implementation of the HSMS, however, much more work needs to be done. The key take away here is that appears to be possible to measure HSMS implementation effectiveness.

Interpretations and Conclusions

Health and Safety Management Systems are becoming more and more popular. There appears to be significant regulatory, consensus organizations and industry group support for this movement. There are differences in how they are implemented and the expectations from them and the traditional style health and safety program. The main differences appear to be that HSMS provides structure, integratedness and oneness of purpose that are not provided in the traditional programmed approach. There are difficulties however in that the success of HSMS depends upon strong leadership or management support, active employee participations and a conducive organizational culture and these are not easy to create and they are very difficult to measure.

It appears through comparative analsysis, that an organization can rely on many of the intervention activities that make up their existing health and safety program can possibly go a long way towards forming a part of the foundation for HSMS implementation should that organization determine that they want to go in that direction. For those that choose to implement HSMS, there appears to be a great number of resources available to assist, depending upon the industry in which the organization resides and/or which consensus organization to which the organization belongs.

It may be some time before it is possible to truly determine the effectiveness of HSMS or even that HSMS is better than the traditional approach, however, there seems to be much energy around implementation of HSMS and sometimes that energy alone can contribute to an overall improvement. One thing remains clear though and that is the main objective of any safety and health approach is to prevent people from getting injured and as such, the effort to do that is worth it until we can determine for sure.

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