

A REVIEW OF INTERNATIONAL DEVELOPMENTS IN OCCUPATIONAL SAFETY AND HEALTH AUDITING PRACTICES.

Kang Eng Thye, Syed Mohamed Aljunid & Krishna Gopal Rampal

ABSTRACT

Auditing is an integral component of the occupational safety and health management system (OSHMS). Why, how and who conducts the OSH audits vary. There are rapid developments in OSH auditing. These are in the context of standardization of the audit mechanism, eg. the development of international guidelines and OSH performance indicators. Criticism has been raised by different professionals in facing both old and new audit approaches occupational safety and health. Malaysia could learn from these experiences in developing the suitable auditing practices. In short, few key areas were learned from the literature review that found important as a good input to local audit practitioners. Firstly, the OSH MS audit should be conducted in the more value added to the organization than just merely conforming to the own disciplinary standard. For instance, OSH audit should incorporate or integrate with other main business functions. Secondly, OSH audit should be adopting more process based performance than just the downstream accident rate measurement. Thirdly, program audit approach should be replace with the system approach so that the real root cause problem could be identified rather than the symptom problem. Forth, there is no right set of OSHMS elements that means any effort to adopt any new standard should be tested thoroughly before blindly adopted it completely. Fifth, audit should go beyond merely comply to the laws and conformance to any standard procedures as well as its rigid definition. Off-job injuries statistic is in fact far more severe compare to the formal workplace injuries rate. Blindly abide to narrow laws definition or standard will result the bigger losses were fail to identify.

INTRODUCTION

Audit is an integral component of the Occupational Safety and Health management system (OSHMS). It is generally defined as a "management tool used to measure performance against agreed standards" (Mercer 1998:5). As such, audit is an important tool to improve OSH services in the industries by identifying any deficiency in the management systems and procedures. Nevertheless, the development of the audit system in OSH is still under evolution and development processes as different countries approach the OSH audit system differently. At the individual level, audit practice received both positive and negative comments. Such contradict ideas among audit practitioners should be enhanced to identifying their actual reasons so that lesson could be learn from the oversea experience to enhance the local OSH audit system in Malaysia context.

OBJECTIVES

There are two objectives for this review paper. (i) To conduct literature review on the current development of international OSH-MS assessment tool. This will help to identify any positive and negative comment on the audit practice.

(ii) To conduct literature review on the various studies on OSH audit performance which will give the picture of the strengths and weaknesses of the audit practice.

METHOD

In order to gather the necessary literature on this subject, the following libraries have been chosen from Universiti Utara Malaysia's library, Universiti Kebangsaan Malaysia library and National Institute of Occupational Safety and Health (NIOSH)'s library. The electronic database system in UKM library is Ovid system and in UUM it is a ProQuest system. For the searching through the electronic database the following keywords will used, (i) Audit practice, (ii) Audit performance, and (iii) Audit system. In order to substantiate some of the discussion in this paper, the relevant books and newspaper articles will used as references.

LITERATURE REVIEW DATA ANALYSIS

Based on the literature review, the result was divided into three components for presentation and discussion, namely (i) The international development of OSH audit practice, (ii) The negative and positive comment on OSH audit, and

• *Department of Community Health,
Faculty of Medicine, UKM*

(iii) The effectiveness of OSH audit performance measurement. A case study was also presented to discuss the scenario of audit practice in the Malaysia environment.

A. International Development of OSH Audit Practices

Under the theme of international development of OSH audit practices, there are three main subcategories. (i) program vs. system approach, (ii) world leading key players of OSHMS and (iii) reaction of countries members towards OSHMS.

- Program vs. System Approach

The traditional safety management was considered as a "program approach" in which it is not integrated with other functions within the organization (Herrero et. al., 2002). Such an

approach is described as more focus on technical aspect of the issue, lack of top management commitment, reactive solution toward an accident, and will only achieve short-term benefits for the organization OSH performance (Weinstein 1997, Hansen 2000). Dyjack & Levine (1996) commented the current safety auditing adopted the systems approach that allows cross program assessment as shown in Table 1. This new system approach would allow identification of real root cause problem and thus reducing the dependence on rigid checklist. They further commented that traditional Occupational Safety and Health Administration (OSHA) that emphasis on compliance assessment is rather a stand alone and isolated approach. Whereas, in the system, it allows a holistic cross programs assessment. Machida & Baird (2001) commented that the success of adopting system approach in ISO 9000 and ISO 14000 has encouraged the same approach in OSHMS.

Table 1: OSH systems assessment (horizontal axis) vs Traditional OSHA compliance assessment (vertical axis).

	Hearing conservation program	Respiratory Protection program	Medical Surveillance Program	Confined Space Program
Health & Safety Evaluation Systems	↓	↓	↓	↓
Health & Safety Control Systems	→	→	→	→
Health & Safety Training Systems	→	→	→	→
Health & Safety Communication Systems	→	→	→	→

Source: Dyjack & Levine (1996:934) Critical Features of an ISO 9001/14001 Harmonized Health and Safety Assessment Instrument.

- Key International OSH MS Development

There are few leading key players of Occupational Safety & Health Management System internationally. For instance, Occupational Safety and Health Administration (OSHA) of US introduces the Voluntary Protection Program (VPP), The International Loss Control Institute (ILCI) promoting the International Safety Rating System (ISRS). Both these assessment tools use the "merit closer inspection due to their systems, non industry-specific assessment approach" (Dyjack & Levine 1996:933). They further commented that ISRS is more detail, and VPP is generally more compatible with OSHMS. Besides that, the University of Michigan had developed the OSH MS called Universal Assessment Instrument (UAI)

with 486 measurement criteria (Redinger 2002). It uses the scoring method. On the other hand, the Occupational Safety and Health Branch of the International Labour Organization (ILO) has work closely with the International Occupational Hygiene Association in developing the OSHMS framework (Machida & Baird 2001). The final draft has been released and approved by the ILO Governing Body with the first publication of the OSHMS Guidelines in June 2001. This guideline has been adopted by many countries including Malaysia as a national OSHMS framework for the industries. Despite having the various OSHMS standards developed internationally, it is difficult to determine which standard is stands a better model over the other and is very subjective and difficult to determine. It is suggests that any OSHMS standard

adopted to any industries should be further tested without blindly applied. Otherwise, it would invite more negative impact than its real benefit as will be further discuss later in the section B.

- Countries OSH MS Model and Implementation

Generally, Kogi (2002) commented that most Asian countries adopted the similar OSHMS model

from the practice of ISO 14000 and ISO 9000 standard. In summary, he explained that there are four types of OSHMS adopted by different countries as in Table 2. There are countries that implementing the OSHMS as a mandatory compliance like Indonesia and Singapore. Whereas, some countries applied the OSHMS through various channel such as certification body, authority OSH organization or encouragement basic without any national standard to follow.

Table 2: Type of OSHMS adopted by different countries

	Type of OSHMS adopted	Countries
1	Mandatory OSHMS that required by laws	Indonesia, Singapore
2	Voluntary OSHMS standards with the support of certification systems	Australia, New Zealand, China, Thailand
3	Promotion of national OSHMS models through authority OSH organization	Hong Kong, Japan, Korea
4	Encouragement of the voluntary adoption of OSHMS without any national standard model	India, Malaysia

In the Malaysia context, the "Malaysia OSH-MS Audit Checklist" Guidelines was developed based on the ILO OSHMS Guidelines by a group of researcher from Universiti Kebangsaan Malaysia (UKM) and Malaysia National Institute of Occupational Safety and Health (NIOSH). It has 225 indicators (not mandatory) that was currently used as a trial period for Malaysian industries (Rampal et al 2002). Concurrently, the OHSAS 18001 is still in practice widely and Standards and Industrial Research Institute of Malaysia (SIRIM) is the key player in promoting the OHSAS 18001 certification. Generally, industries in Malaysia are encouraged to adopt any OSHMS model.

For countries like Indonesia and Singapore, they are implementing the compulsory OSHMS audit approach for industries with 100 or more workers (Kogi 2002). There are three types of audit level, 64 parameters for small companies, 122 and 166 for medium and large companies respectively. The audit parameter also depends on the type of industry risk level. The audit is carried out mainly by an independent body. Whereas for the case of Singapore, OSHMS is mandatory for shipyards and construction industries. The audit is conducted every 6-month and 12-month depending on the project's sum of contract. However, since 2000, the mandatory OSHMS was extended to manufacturing industry with worker exceeding 100 people.

B. The Negative and Positive Comments of OSH audit

Through the literature review, there are both negative and positive comments towards the OHS audit practice.

- Positive Comment on Audit practice

In general, audit plays an important role in ensuring the effectiveness of safety and health performance. It was stated in the OHSAS 18001 standard the definition of audit as "A systematic examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable for achieving the organization's policy and objectives " (British Standards Institution 1999:1). Besides, audit is considered as part of the important component or process (Pybus 1996) to improve OSH discipline-by identifying the deficiency in its system compared to the agreed standard (Mercer 1998; Weinstein 1997; J.J. Keller & Associates 1999). Mercer (1998) further list down the benefits of auditing as the following:

- An evidence of proof of effectiveness to top management and clients
- Comply to regulation and business needs with supporting documented audit report
- The audit result can be used as benchmark with other business
- Audit findings provide action plan to improve safety service
- Audit is a tool for continuous improvement

- Critics of OSHMS Standard and package

Although the concept of audit in OHSMS has a significant important to ensure the effectiveness of OSH performance. Nevertheless, there are still negative comment towards the OSHMS audit. O'Brien. Et al (1994) for instance commented that there is a lot of ready-made OSHMS solution in the market with such deficiency:

- The main focus is more on the written health and safety program and procedure rather than the real workplace requirements.
- It only focus on narrow and problem identifying rather than proposed solutions
- Lack of proper and consistence corrective action plan for non-compliance items for worker protection

Baker (2001) pointed out that although most companies see the value of the OHSAS 18001, but the standard also have some limitation. For instance:

- It focus on written document rather than collect the real evidence.
- Auditor competency was not clearly identified.
- The Certification of OHSAS 18001 only shows the good of safety administration rather than the real mean of effective safety and health management
- The certification is too commercial and unnecessary extra cost. It causes the wrong perception of public towards the meaning of the important of safety and health to the worker

Often the public was misguided by the OSHMS standard that is overstated its real benefit and hidden limitation. As a result, the industries get more frustration than its promised benefit. Mansdorf (1996:17) commented that "Just as ISO 9000 does not guarantee quality products, an OSHMS Standard would not guarantee safety." Famous quality guru, Philip Crosby also criticized the ISO 9000 standard practice is totally misguided with such "delusion that sound management can be replaced by an information format. It is like putting a Bible in every hotel room with the thought that occupants will act according to its content" (Harmon 1997). Heizer & Render (2000) further commented that ISO 9000 is too focus on standard, documentation, work procedures, record keeping which has nothing to do with the actual product quality. It only blindly follows the standard procedures. With that criticism, the OSHMS is far the same as what being commented in the ISO 9000 and ISO 14000.

On the other hand, despite the OSHMS adopting the system approach in audit assessment, the

implementation of safety and health discipline is still being managed under the traditional organization operation. For instance, Dyjack & Levine (1996:934) commented that "Under an OHSMS standard, health and safety auditors would also have to rethink traditional approaches to site assessments. Many US federal and state health and safety inspections and private sector audits tend to be reactive and prescriptive. Alternatively, an OSHMS conformity assessment would evaluate proactive management systems in an approach somewhat similar to the federal Voluntary Protection Program."

C. The Effectiveness of OSH Performance Measurement

The next theme was to discuss the effectiveness of OSH performance measurement. From the literature review, three main categories were summarized namely, (i) The important of performance measurement, (ii) Types of performance measurements that comprises the trailing, current and leading indicators. and (iii) Limitation of audit performance measurement.

- The important of performance measurements

Accurate and relevant OSH performance measurement is important during an audit. With the excellent performance measurement, it will bring the company OSH performance to the right direction. For instance, Mendez (1999) commented that organization needs to measure performance in three areas:

- To lead the entire organization to a desire direction
- To manage the resources needed to achieve its direction
- To operate the processes that make the organization work

The effectiveness of OSH audit depends highly on the type of performance measurement. Nevertheless, there is no universal type of performance measurement. It depends on each organization needs and specific requirements. This is the biggest challenge in the audit system. Without an effective measurement, audit practice will bring minimal benefit and might cause more problems. Redinger et al (2002:35) also commented that there is little attention given on the effectiveness of measurement despite the development in standard-based OSHMS structure. The point is that to determine the detail performance measurement is challenging and difficult to be identified. This statement was also supported by Petersen (2001:abstract) with the comment that "measuring the effectiveness of an

organization's safety system has been a particularly difficult problem for all organizations."

- Type of performance measurement

In brief, performance metrics are divided into 3 main groups as shown in Table 3 (Street 2000:33-

35). The major difference among the three types of indicators is that the trailing indicators basically look at the yesterday issue, the current indicators look at the present event and leading indicators generally predict the future potential risk or as a focus on primary preventive effort.

Table 3: Three types of performance measurement indicators

Trailing Indicator	Current Indicator	Leading Indicator
<ul style="list-style-type: none"> • injury and illness statistics • disability costs • litigation costs • worker's compensation costs • vehicle accidents statistics • regulatory citation & penalties • process release statistics 	<ul style="list-style-type: none"> • safe and unsafe acts indices • incident investigation reporting and analysis • serious potential incident frequency • safety audit findings • occupational medical visits • training records and effectiveness • action on past employee surveys • attendance at, and quality of, safety meetings 	<ul style="list-style-type: none"> • quality of an audit program, including schedule adherence • number of repeat injuries • analysis of process hazards reviews • number of safety work orders/unit of time • incident reporting, investigation and follow up • employee attitudes and perceptions • quality and quantity of employee safety suggestions • involvement of senior management/hourly employees in safety processes and systems

Source: Street (2000:33-35) Getting full value from auditing and metrics. *Occupational Hazards*. 62(8):33-35.

- Limitation of Performance Measurements

On the limitation of performance measurement, Petersen (2001:54) made a comment which said that in today management thinking and research, the audit concept has become suspect. Measuring by number of accidents is relatively worthless, little statistical validity and reliability, and they do not diagnose why the improvement and deterioration has occurred. He further added that the limitation of conventional performance measurement has been implemented for more than 50 years and still being applied till now.

Redinger et al (2002:35) further commented that OSH effectiveness was traditionally assessed by using the conventional data such as illness, injury and fatality rates as a trailing indicators. However, he suggest it could also be assessed in terms of leading indicators that could be difficult to measure. These difficulties were support by Mendez (1999) which said that a number of health care industries are moving beyond the traditional financial measurement into the leadership measurement.

In short, the effectiveness of OSH audit practice was primarily determined by the right performance measurement being employed. Without moving into the leading indicator of performance measurement, the audit effectiveness can become suspicious! The limitation of using downstream measurement such as accident rate, lost time injuries for instance providing no information the

"actual cause" that resulted the OSH problem. Without knowing the actual cause, any corrective action as suggested by the auditors could lead to more serious OSH problem that shall be aware and avoided.

D. A Case Study of Penang Port Sdn Bhd

The assessment of OSH audit effectiveness is rather challenging. A simple case study was selected to summarize the discussion from the main themes like the negative and positive feedback on audit practice from practitioners and the effectiveness of OSH audit performance measurements.

The Penang Port Sdn Bhd is a service industry. In Year 2001, the total medical expenses was RM1.2 million that comprises both employee and their family member, which was 0.6% of total company revenue. Besides, another RM1.5Milion was spend for staff replacement, overtime claim to account for the staff on medical leave. The current employees are 1600 person (22%)and their family members are 5400 (78%) in total (Sin Chew Daily. 2002).

From this case study, it showed that the family medical expenses was nearly 4 times more than formal jobs safety and health claims based on the percentage ratio of employee (22%) and family members (78%). This case study implies that OSH discipline was conventionally focus on the workplace safety and health. Off job safety and health was often neglected. This situation is also

observed among local OSH Practitioners as they confine OSH management within workplace in order to meet local OSH legislation (MDC legal Advisers 2002).

Obviously, with or without the provision of the family medical claim, the hidden cost of the off-job safety and health is far more serious than the on job injury and health problem. In such case, without the provision of family medical claim, it will affect the worker's moral and productivity. Therefore, if the OSH definition was defined very narrowly, the effectiveness of OSH performance through audit will not bring any significant benefit to individual worker and organization as a whole. This case study result also supported by the National Safety Council statistics which indicate that off job injuries is 18 times more compared to on job injuries and the fatality rate is 35 times higher compared to formal workplace (Barick & Jones 1987).

To overcome this limitation, the well-known and leading OSH Company like Du Pont has adopted the off job safety and health awareness for their employees. In its organization's ninth principle, there is a statement mentions that off-the-job safety is an important overall safety effort. Employees should not "turn safety on" as they come to work and "turn off" when they go home (DuPont 2002b). Therefore, a good OSH program should not just cover the formal workplace OSH definition. All various parties such as Industrial OSH practitioner and enforcement officer should work together and move beyond the paradigm of merely compliance to minimum legislative requirement.

DISCUSSION

There are four major key points identified based on the discussion in the three themes and a case study, namely (i) OSH discipline is still undergoing the evolution process, (ii) There is no right set of OSHMS elements, (iii) OSH audit should be audited in line with other disciplines and (iv) Audit should go beyond merely comply to the laws and procedures.

- OSH discipline is still undergoing the evolution process

The evolution of OSH discipline itself helps to improve its own limitation. The shifting of program approach to system approach has gaining some significant improvement. Nevertheless, there is no ending point to overcome the limitation. Although various OSHMS standards were developed internationally, the OSHMS still contains some strength and limitation that resulted the difficulty to identify which is the better standard. In the competitive manufacturing industries, standards and variances are impediments to continuous

improvement (Nichollas, 1998:744). The major limitation of compliance to standard procedure is that it does not encourage further improvement once the target is achieved. This manufacturing industry experience is also applicable to the OSH profession.

Indeed the past experience in the manufacturing industry could also provide a good lesson learnt to the OSH profession in order to achieve the good OSH performance via effective audit. For instance, Nichollas (1998) summarized that the limitation of conventional performance measurement in manufacturing industries are often focus on financial measurement, piece meal of system approach and only solving the yesterday and current problem. Instead, he suggested that performance measurement should focus firstly on competitive issue, secondly on clear and logical measurement and thirdly on trends and long-term improvement plan.

Therefore, without changing the passive and reactive performance indicator to proactive indicator, the audit system is limited to provide real OSH improvement. It only solved the yesterday and today problem, not the future problem. Redinger et al (2002) commented that there is currently no acceptable universal measurement due to the uniqueness of each organization's need, hence, effort to keep on searching the unknown variables is important.

- There is no right set of OSHMS element

The limitation of conventional performance measurement as experienced in the manufacturing industries is exactly the same as in the OSH discipline. The effectiveness of adopting international OSHMS standard package during audit assessment becomes suspicious. Petersen (2001) in his study has found that there was no correlation of accident rates with the audit scores in major organizations over a period. He further studied over nine different OSHMS audit models such as American Industrial Hygiene Association (5 elements), British Standard Institute (2 elements), Department of Energy (5 elements), American Chemistry Council (6 elements), Det Norske Veritas (3 elements), Hospital Association (2 elements) and Australia Work (2 elements). Besides, he mentioned that British Safety Council even had 30 element in the earlier, NOSA system from South Africa have 5 elements and International Loss Control Institute System had 17 to 20 in the earlier format. In short, he summarized that the differences in OSHMS elements are due to bias or personal opinion that design on the OSHMS. As a result, no single universal OSHMS is the best that could be adopted by any organization. Petersen (2001) further proofed in few studies that showed the similar findings.

As a result, the effectiveness of OSH audit practice has become suspicious (Petersen 2001). He commented that nobody queries about audit effectiveness when it become a new trend. He further added that the major problem of packaged OSHMS was that it is equally weighted for each element and seldom have the public question on the elements. He reminded the dangerous of buying an unproven audit OSHMS package which later might affect the audit approach and company OSH performance.

In short, OSHMS only provides the basic guidelines with the common measurement indicators. The major problem is that it does not provide any proper implementation approach on "how" to achieve each element. The conventional OSHMS audit approach that based on the compliance to rigid standard elements, using unrealistic scoring method and too simplified binary answer such as Yes/No format do not really indicate the real root cause of OSH problem.

- OSH discipline should be audited in line with the other business units

Traditionally, OSH audit assessment was conducted only to serve OSH standard without considering the need of company survival issue. As a result, OSH approach is seem as an isolated approach, and getting less top management attention. Occupational safety and health performance should be measured together with other business function (Mercer 1998; Saunders & Wheeler 1991). Thus, OSH auditor should move into the new paradigm by integrating OSH measurement into the organization main stream and helping the top management to view OSH as part of a survival approach. One of the tools that could assist for this paradigm shift is by adopting the TQM principle. In short, multi disciplinary skills, sound technical and management knowledge are vital to become an effective auditor. Integration with other discipline especially the main business functions is important to gain the concern of top management.

- Beyond the compliance audit to real value added audit

Commonly, about 77% of most companies that practice OSH program are mainly focus on compliance to laws and regulation and did not aim for worker's safety, health and welfare (Veltri 1991). This resulted that the whole audit process does not add any true value to worker safety and health protection.

In such challenging situation, the conventional function of OSH audit that merely meeting compliance to laws and standard procedure should be eliminated, and to move to real benefits with

proactive action and integration with other business functions (Dyjack & Levine 1996). However, in the Malaysia context, it is still highly dependence on regulation to push the industries to pay high attention on workplace safety and health. To overcome such challenges.

Using the same experience in quality model, Fletcher (1999) said ISO 9000-based standards are an excellent starting point for organizations working to improve their performance, but it should be viewed as the first step. To achieve world-class performance, organizations must move beyond ISO 9000. Therefore, OSHMS serves as the minimum requirement with the ultimate goal is to go beyond the OSH-MS standard. The Penang Port Sdn Bhd, for instance, is the best example to proof that off-job injury and health problem is in fact more serious compared to workplace problem.

Lastly, the Penang Port case study proofs that conventional compliance audit become suspicious in its effectiveness which only focus the 20% of the overall safety and health problem.

CONCLUSION

It might be fascinating with the idea of audit concept, but the actual implementation is questionable. The various development of OSHMS internationally especially the ISO OHSAS 18001 and ILO OSHMS as an audit tool has received the positive support from both the national and international bodies. The development of OSHMS is encouraging especially in the effort to standardize the OSHMS standard. Traditionally, audit has been adopted as the best approach to identify the deficiency of any OSH practice. However, from the feedbacks of OSH profession, the limitation of performance measurement especially the trailing indicators (e.g. accident rate) are extremely weak to improve OSH performance. In other word, the type of performance measurement adopted during the audit process could affect the audit outcome. Auditor and OSH practitioner should push beyond the minimum requirement of the OSHMS standard among the industries. It is also important to examine the market ready-made OSHMS package which has its limitation. The case study in Penang Port Sdn Bhd gave a good lesson learnt on the hidden variables like off job safety and health, which is far more serious than the on job safety. Lastly, the literature review has presented the scenario of the audit practice in the West which could be the reference for the local OSH audit development.

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