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A REVIEW OF THE STRENGTHS AND LIMITATIONS OF COMMONLY ENCOUNTERED SAFETY PERFORMANCE INDICATORS

ANNE-MARIE MAKIN

BE Chem (Hons), GradDip OHS, PhD (OHS Management) the School of Safety Science, University of New South Wales, Sydney NSW 2052, Australia.

Contact details: Phone 61 2 9385 5370; Fax 61 2 9385 6190, email ammakin@fastmail.fm.

CHRIS WINDER

BA(Hons), GradCert OHS Management, MSc, PhD, FSIA, is professor in Applied Toxicology, the School of Safety Science, University of New South Wales, Sydney NSW 2052, Australia.

ABSTRACT

No single indicator is likely to measure all aspects of safety performance. A range of performance indicators, some negative, some positive, all measuring various aspects of safety in a representative and meaningful manner are required. Leading and trailing indicators are helpful if they are acted upon and used with the intention to improve existing safety strategies and to guide decision making processes. Qualitative information can provide insights that quantitative data is too crude, diverse or widespread to reveal. Outcome indicators are designed to help measure whether targeted actions are being effective. Whilst the difference in performance indicators as far as the timing and responses are concerned is well understood, there may be less appreciation given to the different angles from which these measures are taken – such as whether they are from management's viewpoint; or from the view of operations or the individual worker. This paper critiques a number of the various indicators available, and encourages the use of multiple measures to circumvent pitfalls associated with particular aspects of some commonly encountered indicators.

Key words: Occupational health and safety (OHS), OHS Management Systems (OHS MS), Safety performance, Negative performance measures (NPIs, Positive performance measures (PPIs), Key performance measures (KPIs), OHS MS Auditing.

INTRODUCTION

The task of data collection to understand organisational hazards is not easy. It depends to some great extent on the perspective where such hazards are viewed from. The chosen perspective is likely to reflect the purpose for which the data was collected in the first place. Data may be collected from the perspective of:

- the individual worker, for example in perception surveys;
- an operations viewpoint by looking at the hardware and operating facilities and conducting a risk assessment; or
- management, which may take the form of an audit or a due diligence gap analysis.

The validity of one perspective over another is subjective and is dependant whether the purpose for the measurement was to generate improvements in a certain area of operations, to assist management in decision making, to evaluate the current situation amongst personnel or to assess the perceived effectiveness of changes. It

is unlikely that measures taken from one perspective would tell the whole story, just as the benefits of any corrective actions implemented would be limited if they did not consider the full context of the situation and those affected by the changes. As an example, an injury reported from the perspective on the injured worker will almost certainly be different from the information reported by the injured worker's supervisor. Explanations for root causes may be entirely different, and different once again if the incident was reported by a member of the organisation's executive. In this instance, which data is more reliable? If the data is biased from the onset, this will impact the nature and effectiveness of the solutions generated (there is also the problem of where the bias lies). Hence there is a need to take multiple measures and attempt to capture different perspectives.

To assist this process, a review of the literature was conducted in an attempt to provide a concise summary of a number of commonly encountered methods to measure or capture safety performance. Injuries, illnesses and unusual occurrences such as near misses or near hits are all undesirable events and so there have been recent attempts to find more positive indicators. It would appear that like most metrics, the key is to find something that is meaningful, robust, representative and not susceptible to manipulation. Measurement (especially against planned targets or objectives) has the advantage of focusing management attention.

If there is too much performance data, or the data does not assist in identifying and assessing problems and impacts, organisations may become desensitised and unresponsive to any new information presented. Therefore, it is important to maintain interest by having a range of metrics available that may target specific areas on a strategic or rotating basis. Understanding the strengths and limitations of the various indicators is therefore crucial if they are to be applied in the most appropriate manner. One fundamental concept remains - without some baseline measurement it would be impossible to assess improvement or otherwise.

A CRITIQUE OF OHS MEASUREMENT INDICATORS

Table 1 shows a range of OHS performance indicators, the perspective from which they are usually drawn and the time span they are usually invoked over.

Table 1: Performance Indicators

PERSPECTIVE	SHORT TERM	LONG TERM
MANAGEMENT	• Lost time injuries/Workers compensation data • Medical treatment injuries/First aid reports	• Due diligence reviews/gap analysis • Auditing • Maturity grid measurements
OPERATIONS	• Control charts/Trend charts • Positive performance indicators • Safe/Unsafe Acts Observations • Controlled self assessment	• Risk assessments
EMPLOYEE	• Near hit reporting • Perception surveys	• Staff turnover rates

A critique of some of the most popular indicators is outlined below.

From the Perspective of Management

Lost Time Injuries and Workers Compensation Data

Lost time injuries are a major measure used by industry and insurance organisations to assess safety performance. As such, they are measures of safety failure and have been described as negative performance measure (NPIs) and are not a true indicator of all safety-related activities.

Some of the problems associated with lost-time injury frequency rates (LTFR's) and workers' compensation data include:[1]

- incentives to under-report to reduce premiums;
- under-representation of occupational illnesses;
- under-representation of self-employed workers, contractors, labour-hire workers and others; and
- responses tend to be reactive by nature.

Trailing indicators, such as these should be used with caution. A business may become so engrossed in the management of injury classifications, that it focuses on the definition rather than the root cause.[2] The typical example here is where injured workers are brought in to be "at work" simply to avoid the injury being categorised as "lost time".[3] Placing too much emphasis on injury statistics may also have a negative effect by sending reporting underground or masking serious injuries, especially if a reduction in the number of injuries is linked to a bonus or other financial rewards.[4] [5] Further, where social or ethnic cultures "lose face" where organisational failures occur, reporting by subordinate officers may be absent.

Clearly, an organisation cannot expect injury rates to reflect progress made on managing chemical safety or dealing with psycho-social issues. Injury rates will most often reflect changes made to the physical workplace and possibly changes made in behaviours and attitude. Hence the scope of this indicator and its meaning must be conveyed to management so that changes in injury rates are not taken out of context and plateau effects are not misinterpreted to suggest that current actions are not being helpful.

Whilst the incentive exists for the manipulation of indicators associated with direct financial benefits, the success of such ploys is less likely when alternate cross-checks are in place. In some cases it may be necessary to quantify in monetary terms both the direct and indirect costs of injuries so as to "work with the same currency" as other business units in order to initiate the launch, and to successfully implement, an OHS program.

The benefits of using LTFR's in larger organisations is that they provide a means of benchmarking across various sites, various industries or even internationally. However, these figures may not be meaningful to smaller businesses with very low incidence of injury or illness. For smaller organizations, the difficulty with reporting lost time frequency rates expressed in injuries per million person-hours is that unless the person using the figure is familiar with benchmarking exercises, it does not communicate the significance of the number of actual injuries experienced within the local work environment. Hence in these situations it may be better to report actual injuries/incidents to allow better visualisation of the problem. Nevertheless, LTFR's have an important place in performance measurement, and may provide a good starting point to work from and help convey a broad understanding of the relative scope of the issues that may be confronting management.

Medical Treatment and First Aid Injuries

Medical treatment injuries (MTIs) and first aid treatments are also NPIs.

A significant problem associated with MTIs and first aid treatments is the potential for-under-reporting. Even where MTIs are reported, they may be disguised as first aid injuries, and their true impact not recognised. However, the cynicism generated by such actions within the workplace may be far more damaging in the long term than any administrative inadequacies or financial incentives used to manipulate the system.

While they are still negative measures, the advantages of reporting medical treatment and first aid injuries on a regular basis are that they are straightforward, easy to conceptualise and usually provide sufficient data for analysis.

Due Diligence Plan Reviews and Gap Analysis

Some organisations use a due diligence plan or gap analysis to drive the OHS (or other) program.This plan can be used to steer and focus the management team, and typically comprises of a list of projects identified to improve regulatory compliance with responsibility allocated to various personnel and time frames for completion identified.6 Projects are usually prioritised according the level of associated risk, and the existence of such a plan demonstrates a willingness to abide by local regulations, whilst acknowledging that often only limited funds are available. Review of these plans is crucial to demonstrate due diligence, and provided that realistic deadlines have been agreed upon, monitoring the clearance rate of projects provides a useful means of gauging the reality and sincerity of management commitment.7, 8 For example, continual delaying of project funding or extension of project deadlines may send a poor message to those within the organisation, perhaps suggesting a lack of urgency or commitment to the work. Once these plans are well established and functioning, they can then be broadened to include projects that go beyond regulatory compliance.

Auditing

Audits are often unwelcome from those being audited. An audit should not be confused with a workplace inspection, hazard spotting exercise or gap analysis. The ANSI/AIHA Z10-2005 standard defines an audit as "a systematic process for obtaining information and data and evaluating it objectively to determine the extent to which defined criteria are fulfilled".[6] When applied specifically to OHS MS, there are two distinct types of audits:

- Validation audit – which seeks to determine whether the system being audited is in fact capable of delivering the desired OHS benefits. Often this may be assessed against an accepted OHS MS model such as a standard.

- Compliance or verification audit – where the intention is to assess compliance with the organisation's own procedures and policies.[9]

Compliance or verification audits are often conducted by those internal to the local organisation, whilst a validation audit is often conducted by a third party such as an accreditation body.

It is essential to understand the purpose of the audit from the onset – is the system itself being checked or is it its application. Logically, a validation audit must precede a verification audit, although in practice they are sometimes combined.

The frequency of an audit may vary from anywhere between six months and two to three years, depending upon the stage of implementation of the OHS MS.[9] Once the OHS MS has been constructed and implemented effectively, validation audits should be used to determine its ongoing suitability. In the initial implementation phase, these validation audits may occur more regularly to ascertain whether the system is adding value. The results of compliance audits may suggest areas that are simply not working, for example in cases where the system requirements have been imposed without consultation, feedback or sound justification. Internal auditing and management reviews form essential components of the self-regulation process.[10]

Professional judgement, objectivity and experience are all necessary precursors for a reliable audit. Bluff and Johnstone suggest pragmatically that a critical outcome of the audit process is to "alert management in the organisation to confirm strengths and identify key weaknesses".[1]

In theory, an audit appears to be a sensible test for the effectiveness of an OHS MS, based on the premise that by focusing on improving the process, a desirable outcome will naturally follow. Surprisingly, this has not been substantiated by studies - implying that there are major issues with the effective application of OHS MS in practice.[11,12] Difficulties associated with attempts to correlate OHS performance improvements (as measured by a reduction in injury rates) with audit results include the following:

- the audit tool may not reflect the hazard profile of the organisation;[13-15]

- the auditor may not have sufficient experience with the process or appreciation of the nature of the organisation to be able to determine whether all the hazards have been effectively captured by the OHS MS in place;[1,14,15]

- there is the potential for corporate politics to interfere with the outcome;[16]

- the number of requirements may be overwhelming, causing some organisations to stop at the internal audit process, or abandon the process entirely;[17]

- parties being audited may reject the findings and refuse to follow-up on recommended actions if the value of the audit is not appreciated or accepted from the onset;[9] and

- some schemes engender a false sense of confidence.

Compliance or verification audits generally involve a triangulated approach – combining evidence assembled from interviews, observations and supporting documentation. Accepted recommendations from the audit may then be fed into a due diligence plan or other OHS program. Despite the numerous difficulties with audit application, the benefits of introducing objective and independent observers who are aware of best practice should not be overlooked.[1] As captured insightfully by Nash, the success of an auditor hinges on the "ability to see beyond fresh paint and listen to what people aren't telling you".[16]

Maturity Grid Concept

Applied mainly in the context of assessing organisational safety culture, this concept is traditionally attributed to the work of Westrum, and was heavily endorsed by Reason and Hudson and later extended by Parker et al. Westrum originally proposed three typologies that promoted the positive qualities demonstrated by high reliability organisations as identified by Weick in 1987: The typologies given were: pathological, bureaucratic and generative. The term generative was used to describe an organisational environment that was open to new information and ideas and accepted responsibility. On the other end of the spectrum, pathological organisations abdicated responsibility, disguised failures, and rejected new information and ideas. Reason later retained the two extremes – pathological and generative and subdivided the middle level of bureaucratic into three – reactive, calculative and proactive. Reactive described those organisations that, as the label implies, respond to accidents but do little in the way of prevention. Calculative organisations were described as having a systematic approach, but there is considerable bureaucracy – essentially good intentions but aims were not necessarily achieved beyond superficial problem solving. Proactive organisations displayed strong planning activities and attempted to address root causes. The generative classification was extended to highlight positive qualities such as trust, perseverance, and an understanding of potential hazards beyond the physical environment.[18]

These models offer some fresh perspectives on desirable attributes within organisations to enhance OHS performance, including the need to care for colleagues and the importance of follow-up on audit recommendations.[19] A limitation of the maturity model is that the pathological – reactive – calculative – proactive – generative spectrum focuses mainly on the desired outcomes that management may aim for to manage OHS rather than the means of arriving at that point. A multitude of variations on this conceptual framework have been presented, with every deviation highlighting features considered substantially connected to the sought after yet elusive definition of "safety culture". Work by Eckenfelder and Fleming for the UK Health and Safety Executive and Hansen reinforces a growing acceptance that there are definite stages to the path of organisational maturity, although agreement on the particular pathway is mixed.[20-23] It is noteworthy that many of the descriptors used to describe early phases are often negative, some to the point of disparaging, presumably to incite progression towards more desirable objectives. These typologies are also often very subjective, sometimes lacking in concrete descriptors of what is actually required to promote progression to the next stage, and as such may weaken the application of such a promising indicator. However, there is scope to develop customised pathways for individual organisations which may concentrate on particular needs and focus management's attention.

From an Operations Perspective

Risk Assessments

Risk assessmentsare typically applied in three stages:

(i) hazard identification;

(ii) an assessment of the level of risk - taking into account the *likelihood* that the hazard will cause harm, the degree of *exposure* and the *severity* of potential harm caused; and

Iii the application of control measures to minimise the risk.

Although it is this simplified, three-step risk assessment methodology that is commonly referred to in general practice and OHS regulations, this only represents part of the original, more robust risk management process described in AS 4360[1] that encompasses the following steps:

(i) Establishing the Risk Context

The organisation should be considered as a whole, legal requirements identified, hazard profile established, criteria developed against which the risks will be evaluated, and the method of analysis established. This anticipatory step is frequently overlooked, with risk assessments often only focusing on a narrow section of the overall system.24

[1]AS/NZS 4360 Risk Management was superseded by AS/NZS ISO 31000 Risk Management: Principles and Guidance, Standards Australia, Sydney, 2009.

(ii) Identifying the Risk

Risk identification should consider both normal and abnormal situations, start-ups/shut-downs, shift changeovers, routine and non-routine maintenance and modifications to the normal operating environment.[25] For this reason, a single workplace inspection is unable to account for all the potential sources of hazards/risks as it only represents the situation at a given point in time. However, this may serve as a useful starting point.[26,27]

(iii) Analysing the Risks

This involves collecting evidence or information on the nature and consequences of the risk. Codes of practice, standards, material safety data sheets (MSDS), exposure limits and regulations may need to be considered at this point.[28] An evaluation of the effectiveness of existing control measures is also desirable at this time, although Main suggests that in the first instance it may be more useful to consider the hazards as if no control measures were in place. This has the benefit of identifying areas of vulnerability should key control measures fail. Monitoring may be required to determine the level of exposure, for example with noise or hazardous substances.[26,28]

Risks may be evaluated: (i) subjectively with qualitative risk assessment using descriptors to capture both the severity and likelihood of an event in order to determine a ranking position on a risk matrix; or (ii) numerically with quantitative risk assessment to denote the probability of an adverse event occurring; or by using a combination of qualitative and quantitative methods.[29-31] It should be stressed here that a risk ranking exercise should be customised to the particular organisation that is be assessed. For example, a risk ranking of "high" for a small business may represent a situation that is likely to result in a single fatality, whereas for a high reliability organisation, a risk ranking of high may be interpreted as meaning multiple fatalities such as an airplane crash or an explosion on a chemical plant This emphasises the importance of understanding the scope and context as a crucial first step of the process.

(iv) Evaluating the Risks

This stage involves comparing the level of risk determined to the acceptance criteria previously established. Regulations require that risks be reduced to a level that is as low as reasonably practicable (ALARP).[31] "Reasonably practicable" requires a sensible balancing of the magnitude of the risk with the sacrifice involved to successfully address it, and may necessitate some level of value judgements. Decisions to accept the risk should consider not only the organisation itself, but also the tolerability of the risk to other affected parties.[32, 33]

(v) Risk Treatment

Outcomes from this stage of the risk management process are to select one of four methods for dealing with the risk:[26]

- *eliminate* the risk (the ultimate solution);
- *retain and manage* the risk;
- *outsource* the risk to people other than the organisation's employees, such as contractors, pieceworkers or offshore arrangements;
- *transfer* the impact of risk failures through insurance and similar financial arrangements.

Risks that are outsourced or transferred may be relatively easy to handle provided that safeguards check the nature, suitability and viability of the outsource or transfer option. Difficulties are most commonly encountered when there has been a decision to retain and manage the risk within the organisation. Typically this has been managed through the application of the traditional hierarchy of controls – involving elimination; substitution; isolation; engineering controls, administrative controls; and finally personal protective equipment. Whilst this model has become formalised by most OHS authorities, it does not always deal effectively with the entire range of hazards and risks that currently confront employers.

(vi) Monitor and Review

An essential stage of the risk management process is to review the effectiveness of the risk reduction strategies utilised. This provides organisations with an opportunity to learn from past actions and also offers the possibility of sharing best practice where applications have been successful.

As far as shortcomings of the risk management process are concerned, the length and intensity of the technique can sometimes discourage its use, with some businesses refusing to undertake risk assessments unless they are deemed to "add value". Also, the evaluation stage needs to be conducted with sufficient time allowed for the most appropriate solutions to be implemented.[24] This may lead to issues being dealt with superficially on the basis of expedience, rather than eliminating problems from the source.[34]

Perception of risk is a highly contentious issue as perception by definition, will vary from individual to individual.[35] This can lead to inconsistency in the risk analysis stage.[36] Flemming, Geller and Adams suggest the following factors influence the perception of risk: [37-39]

- what is known about the risk including future implications;
- the apparent level of control over the situation;
- situational awareness and understanding of outside influences;
- the depth of task knowledge;
- whether the potential consequences relate to everyday experiences, require specialist knowledge or are the subject of speculation;
- experience and the frequency of previous task performance;
- the potential to imagine vivid, gruesome or frightening outcomes; and
- personality-dependent risk taking attributes.

Complacency can be very dangerous where the task is routinely performed - leading to risk habituation or even risk blindness. Activities with low level consequences but high levels of frequency are prone to being underestimated. This phenomenon may be overcome by ensuring the involvement of objective team members during the risk assessment stage.[37]

Lack of situational awareness has been implicated in many disasters and is a critical factor when outside specialists are called in to identify hazards on a site where they have no prior experience. The explosion at the Esso gas plant in Longford, Australia illustrates the danger of analysing risks in isolation, a problem that is accentuated when those assigned to the task lack in-depth understanding of the process.

Risk assessments may be complemented by perception surveys (discussed later) to provide more insight into the context of the risk scenario being considered. They also may provide a focal point for increased dialogue with stakeholders. On their own, risk ranking exercises are less effective than if they are followed up with concrete action plans. Like audit actions, if there are too many findings or if they have not been carefully prioritised, the list can become overwhelming. Targeting a few strategic actions that will have a significant impact on the overall OHS performance and planning to have a few "early victories" may provide some initial momentum for the successful implementation of the findings from the risk assessment process. Where the risk assessment is not followed up, there is the opportunity for cynicism and lack of credibility to develop.

Control Charts and Trend Charts

Control and trend charts are measures that were introduced in the total quality management (TQM) era of the late eighties and early nineties. By plotting safety records in the same manner as quality non-conformances, the aim was to identify trends and distinguish between common cause variation and special cause variation in order to facilitate process improvements. Carder and Ragan argued that the injuries and illnesses experienced were simply a manifestation of the capability of the current system, and that in the past such events were incorrectly treated as "special cause" variations, that is outside the sphere of influence of the organisation and not a function of the existing systems and processes. However, Carder and Ragan maintain that injuries and illnesses are more often a result of "common cause" variation reflecting the net effect of the established processes.12 Interestingly, removal of special causes of variation does not actually improve the process, but simply brings the results back to the natural level of variation as a function of the processes currently in place. 40 This argument supports the need to address incidents at a root cause level so to affect change that will correspond to lasting rather than superficial improvements.

Simply following the trends and observing whether there are patterns from control charts or any other plot of incidents provides significant benefits, particularly in the situation where a plateau is occurring.[41] This may

signal an alert to provide a systematic change to current processes if further benefits are to be realised, although it is often interpreted as the point to introduce behavioural based safety techniques. However, any change implemented is unlikely to have enduring effects unless the root causes of the problem have been addressed, whether this involves behavioural change or otherwise. It is also possible that there may be a time lag involved between the changes made and improvements realised. This can obscure the effectiveness of interventions. A plateau in injury and illness figures should signal a re-examination of the existing processes, especially on a design or physical hardware level as these have the potential to provide the most enduring changes, but are also likely to be the most expensive to implement. A key point to note here in the collecting of data is the need to change the graduation of the dial being used as further improvements are sought. For example, as injury rates fall, focus may shift from LTI's and MTI's to concentrate on First Aid injuries, which may provide more data to work with to extract opportunities for improvements. Continual awareness of the coarseness of the dial being used will promote the continual improvement pathway.

Although the popularity of using the control chart method as a means of depicting performance measures has waned considerably - the importance of making enduring changes to the processes that govern final outcomes has clear merit. The TQM era must be recognised for emphasising the importance of proactive versus reactive measures and promoting the concept that the responsibility for negative outcomes rests largely with the process owners.

Positive Performance Indicators (PPI's)

While PPI's may be viewed as a derivative of the TQM era - promoting the examination of processes that impinge on safety outcomes, whilst removing the difficulties and resistance to the use of statistical control methods.

PPI's may be applied to any point that is upstream of the final outcome. The aim is to improve the elements that combine to produce the end result. The Australian Federal OHS Authority Comcare provides a clear definition with the following: "Outcome indicators show if an organisation is achieving its targets while PPI's measure the actions taken to achieve targets".[42]

The Audit Commission, UK offers the following advice for the general selection of performance indicators:[43]

- clarity of purpose - an appreciation of how the information will be used and by whom;
- focus - on areas that are priorities for the improvement process;
- alignment - there should be convergence with higher objectives;
- balanced objectives - between short-term and long term targets;
- regular refinement - indicators should be become more challenging as time progresses and more information about the processes is learnt; and
- robustness – need to be able to withstand scrutiny and validation;

The UK Audit Commission even promotes the use of PPI's that are "tin openers" to exert pressure where necessary, for example if the length of time to complete investigations was excessive. Including PPI's that spotlight management activity as well as employee behaviours may reinforce the message that everyone is responsible for safety, not just a select few.[44] PPI's should ideally be formulated under a framework of consultation to encourage ownership.[42,43,45]

There are numerous warnings within the literature to ensure a sensible approach with PPI's, such as not using so many that it becomes overwhelming or too time consuming; not using unnecessary PPI's that sidetrack attention from important issues; and not selecting PPI's where the information received would not be acted upon.[42,46]

Safe/Unsafe Acts Observations

Safe act observations may be viewed as PPI's that focus on critical safe behaviours. The emphasis on safe rather than unsafe acts reflects a growing awareness of the need to provide positive feedback to reinforce desirable behaviour, and a detachment from earlier campaigns that may have been construed as blaming the worker. Much of this work was pioneered by Komaki et al, and later supported by Krause et al and Sulzer-Azaroff.[47 48]

There is clear merit in encouraging employees to be more in-tune with their environment and in remaining alert to potentially dangerous situations. Not all persons are naturally inclined to operate in this manner, and some may prefer to focus their attention on a particular aspect of an operation and cut off all other distractions. Bearing this in mind it may be useful to seek out those persons who are adept at reading their environment to champion such behavioural programs and also to promote awareness of the dangers of being detached and insulated from one's physical work environment.

The problems with this type of indicator is that it is time consuming to collect and may only offer benefits whilst the attention is being focused on the behaviour at the time. The benefits of these programs are quick results for comparatively little capital expenditure; however the effects are likely to be short-lived unless the changes in behaviour have been accepted and are congruent with internal values. It is the change of these internal values that presents the greatest challenge, and where the true benefit of "active caring programs" and other behavioural based safety programs exists.

Controlled Self–Assessment

As suggested by HB 436:2004 Risk Management Guidelines Companion to AS/NZS 4360:2004, auditing alone is insufficient to effectively monitor and review risks to health and safety. The intent of controlled self-assessments are to ensure that current treatment strategies are effective and that new threats have not emerged.[31]

The advantage of using controlled self assessments on a regular basis is to encourage the habit of periodic checking. This is more preferable than waiting for an audit, as there is less opportunity for improvement strategies to go off track. Furthermore, these reviews often provide a framework for comments, which may offer richer and perhaps more subtle information than any quantitative or semi quantitative results.

One of the greatest benefits of the controlled self-assessment is that it is "in-house" and line management are given an opportunity to address their own problems before an outside observer is called in. Once the self-assessment system is established, a persisting problem is getting managers to carry out the assessments. Analogous to "client centred therapy", this works on the basis that those who own the problem are in the best position to solve it, and so the possibility of a full and frank disclosure is more likely when conducting investigations.[49] Spot checking of a small random sample of results by a co-worker can improve the nature of the results by overcoming the greatest potential disadvantage – the lack of objectivity. The limitation of this lack of objectivity must be carefully balanced against the benefits of providing a "face saving exit" for those involved with projects or initiatives that have gone off track, and the opportunity for quick rectification that this provides.

FROM THE PERSPECTIVE OF THE INDIVIDUAL WORKER

Staff Turnover Rates

According to Argyris as developed in his incongruency theory, individuals experiencing frustration and conflict due to organisational demands may respond by leaving or becoming unresponsive, disinterested and apathetic.[50]

A questionnaire study by Shannon et al that surveyed 770 companies and received responses from 417, found that "companies with older workers, workers with longer seniority, and with low turn over rates tend to have lower LTFR".[51]

Near Miss/Hit Reporting

Jones et al define a near miss or hit as a "hazardous situation, event or unsafe act where the sequence of events could have caused an accident if it had not been interrupted. A learning experience for internal use by the company".[52] Usually, near hit reporting is available in organisations with sophisticated or well developed OHS MS.

Whether the terms "near misses", "near hits", "unusual occurrences" or "unusual incidents" are used is likely to reflect the track record of past events of concern within local work environment. For example, near hit implies a potential contact injury, whereas an unusual occurrence may be an unexpected pressure release from a chemical plant. The difficulty with using the term "unusual" is that it involves a low frequency event. When such events become commonplace the incident may escape reporting on the basis that it is not unusual. This may have been the result of lack of action against earlier near misses or hits and may be due to conflicting priorities or pressures, insufficient resources or a perception that there is nothing to be gained by the investigation.

Whatever terminology is used, the concept is to provide additional opportunities to rectify the potential for negative impacts on safety and health. These indicators are particularly useful where there is the potential for high consequence, low probability events. Where there is the potential for negative ramifications in drawing attention to events, the possibility of anonymous reporting should be considered.

These reporting schemes encourage reporting and may overcome psychological barriers towards documenting incidents within the workplace. Also addressed are concerns that injury reporting does not capture the seriousness of events, but only the severity of the personal impact. The limitations of this indicator are that there is little scope for cross-referencing if the event didn't actually cause harm and it may sometimes even lead to over-reporting of events. This may occur where other agendas come into play, for example to make a point where messages to management are not perceived as being heard, or simply due to coming to grips with a new system.

Where a very high number of events are reported it may be necessary to screen and prioritise reports to ensure the most effective use of investigative resources. For organisations that have only recently embarked on a process of improving organisational safety, the large numbers of reports may become overwhelming and jeopardise the quality of investigations for more significant events. These issues should settle after a period of time and initially more resources may be required for the set up of system. It is important on the level of every individual employee that there is an opportunity to build up positive personal experiences with an organisation's OHS MS.

Perception Surveys

Perception surveys have developed in a response to the numerous difficulties associated with correlating performance with injury rates. As articulated by Petersen, "perception surveys assess what hourly employees think about what works and what does not work in a safety system".[53] Areas typically investigated by these surveys includes management credibility, visible leadership; employee involvement; flexibility of work conditions; recognition; enforcement of safety rules; the competence of line management; housekeeping; investigations and even the success of substance abuse programs.[54]

Grote and Kunzler conducted an elaborate perception survey to assess safety culture in the petrochemical industry across six sites. Questions covered three main topics – operational safety; safety and design strategies; and personal job needs which included quality of training and job design. Operational safety was subdivided in three sections – enacted safety, formal safety and technical safety. The survey was designed to compliment formal audit techniques in order to provide a greater insight into the management methods and safety culture and no correlation was attempted between results and injury rates.[55]

Perception surveys also have merit in their symbolic nature – by demonstrating that employee feedback is valued. The choice of a perception surveys is in many ways analogous to the decision to conduct a qualitative case study rather than an experimental quantitative research. The findings are less definitive and may not be extrapolated to a wider population, yet there is significant merit in the understanding an insight obtained from the examination of a particular area in such detail. Lastly, if employee perception surveys are used, it is important to provide feedback to employees about their responses and what action management proposes to address their concerns.

The findings of perception surveys are more likely to be operationalised when performed in conjunction with a risk assessment. This has the benefit of balancing highly contextualised information and providing some rationale for the prioritising of actions or adjusting the ranking of the risks assessed.

CONCLUSION

There a variety of measurement techniques available to improve safety performance. Emergent themes include breaking down larger goals into short term objectives; the need for multiple measures; the need to change the yardstick as performance improves to avoid stagnation; and the importance of using these metrics in a way that is meaningful and constructive.

Outcome indicators such as the number of injuries still firmly have their place as they send critical information and there is little value in denying their importance. However, a reduction in injuries is unlikely to eventuate without the regular tracking of carefully aligned supporting activities that contribute to safe work practices.

The need to preserve relationships and maintain morale is another important theme. Parameters that indicate desirable activities and show pathways for success are particularly useful. Bearing in mind the potential

for data to be manipulated, an understanding of how this may occur may assist in the selection of indicators and ensure that suitable cross-checks are in place. Finally, a clear understanding of who will be using the information and for what purpose is crucial to the selection process. It is ultimately the target audience that dictates the type of indicator necessary so it is essential that the aims and objectives of using the particular indicator are clearly understood from the onset.

Finally, safety improvements cannot be achieved by an OHS facilitator working in isolation - they are a team effort. Understanding the alternative perspectives of indicators used may help broaden opportunities to gain co-operation from the various stakeholders and when combined with the careful selection of OHS performance measures, this may provide a much needed catalyst to regenerate the OHS improvement process. .

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