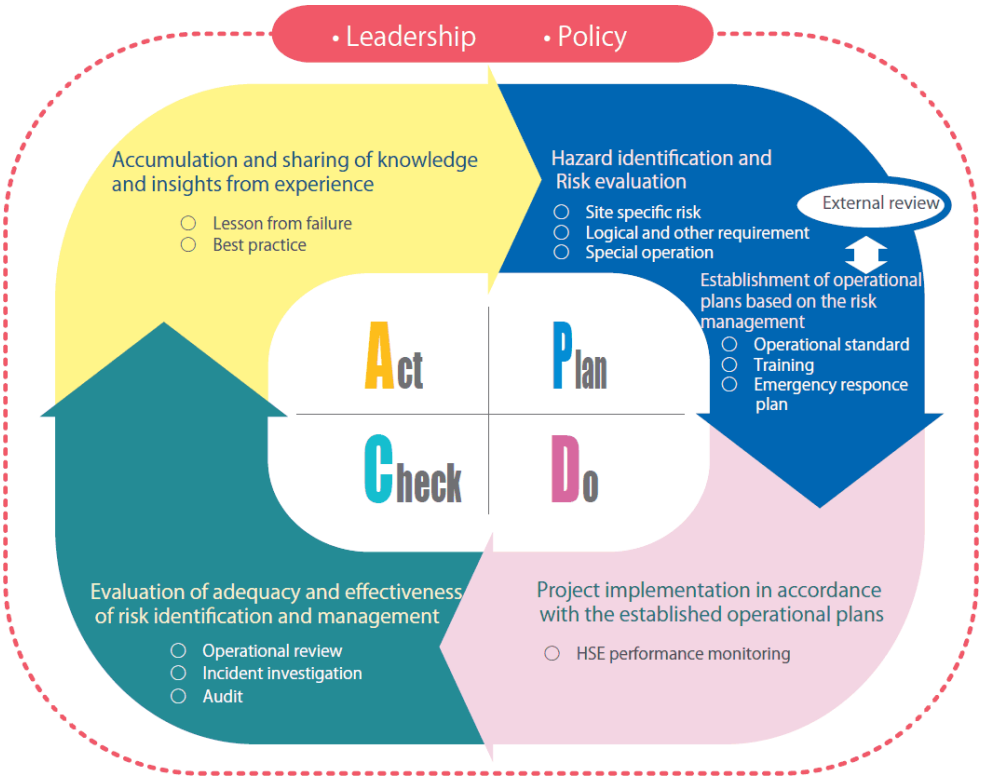
SAUDI BINLADIN GROUP
OPERATION & MAINTENANCE

SBG O&M HSE PERFORMANCE MEASUREMENT AND MONITORING



1. APPLICABILITY

1.1 This standard is applicable to all SBG O&M projects and majority owned subsidiaries worldwide.

2. OVERVIEW

2.1 The process of regularly monitoring and measuring HSE activities and performance is an essential part of a successful management system. It provides critical feedback in two fundamental areas:

2.1.1 Ensuring the organization's significant HSE aspects are being controlled

2.1.2 Detecting and correcting program or control weakness in order to prevent incidents such as injuries, illness, environmental damage or regulatory violations

Both proactive and reactive monitoring has value in achieving a strong HSE Management System and this standard drives development in both directions. A significant proactive measurement and management tool is self-assessment. Self-assessment involves the regular and comprehensive evaluation of an organization's program compliance and effectiveness.

Awareness of significant HSE aspects and development of controls are both critical and valuable elements of a management system. An organization can only manage significant HSE aspects effectively when regular monitoring, measuring and self-assessment are included as a core part of the management system.

3. DEFINITIONS

3.1 Definitions for underlined text are found at the end of this document.

4. REQUIREMENTS

4.1 The organization shall implement a documented HSE monitoring and measurement process to address the following minimum requirements:

4.1.1 Reactive and proactive measures of performance

4.1.2 Monitoring on progress, status and completion of HSE objectives

4.1.3 Performance and effectiveness of operational controls

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4.1.4.2 Assessment of compliance and program effectiveness for all applicable Legal and Other requirements as identified through the organization's

4.1.4.3 Assessment of control effectiveness for any other business specific HSE issue that is not captured in sections 4.1.4.1 or 4.1.4.2 of this standard

4.1.4.4 Documentation of assessment results in the SBG O&M Self-Assessment Tool (SAT)

4.1.5 A process to assess the quality and effectiveness of corrective action program (see Corrective and Preventive Action (HSEMS 213)).

4.1.6 The organization's system to receive and respond on stakeholder or workforce HSE concerns or complaints (see HSE Communication (HSEMS 209)).

4.1.7 Corporate HSER annual operating plan (AOP) requirements

4.1.8 Monitoring, measurement and self-assessment program frequency must be based on the significance of the aspects, risk assessment results and applicable legal requirements. In particular, higher priority significant HSE aspects must be frequently monitored and assessed.

4.1.8.1 Compliance to the organization's schedule shall be included in the monitoring and measurement program as a performance measure

4.2 The organization shall conduct and document periodic trend analysis on HSE monitoring, measurement and self-assessment results. As a minimum trend analysis shall be conducted annually.

4.3 Results of the organization's monitoring, measurement and self-assessment program as well as trend analysis results must be incorporated into the management review process, aspects and impacts assessment, objectives planning and development of corrective/preventive actions.

Organizations need to monitor their performance to assess how well they are controlling risks. A low accident rate is not necessarily a sign that all risks are being managed, and so measures of performance need to be more wide ranging.

Measuring health and safety performance

There is a saying that 'you cannot manage what you cannot measure.' Whether this is true or not, it is clear that measuring health and safety performance is an important way of identifying where improvements are required and to priorities action.

Active measures

Active measures give feedback about performance before incidents are experienced. Obviously this is preferable, assuming suitable preventative actions can be taken. An additional benefit is that active monitoring measures success and reinforces positive achievement. Active measures usually consider the following:

- Achievement of specific plans and objectives;
- Operation of a health and safety management system;
- Compliance with standards and procedures;
- Site condition inspection;
- Environmental monitoring;
- Health surveillance;
- Behavioral observation.

Reactive measures

Reactive monitoring is triggered by events including:

- Injuries;
- Ill health;
- Property damage;
- Incidents with potential to cause harm;
- Hazard reports;

In reality reactive measures are more tangible than active, and for this reason many organizations remain fixated with them. Also, it is fair to say the occurrence of an incident does focus the mind more than some active measures can ever achieve. However, whilst reactive measures still give the opportunity to learn a great deal, these opportunities often occur after someone has been injured or some other loss has occurred and so can be considered as being too late.

Looking for problems

Inspection and audit are planned events intended to identify problems with the way health and safety is being managed.

Inspections

Inspections generally involve looking for physical evidence of how well health and safety is being managed. A general inspection of premises is likely to involve people looking at the condition of premises, floors, passages, stairs, lighting, welfare and first aid facilities. Inspections of higher risk items need to be more specific, and are often required by legislation. They include pressure vessels, lifting equipment, scaffolds, excavations and local exhaust ventilation.

The people carrying out inspections need to be suitably competent, and will usually use some form of inspection checklist. To be effective, inspections need to be planned properly, carried out at a suitable frequency, record suitable remedial actions and not be restricted to the specific items but used as an opportunity to make general observations (e.g. housekeeping and cleanliness).

Results of inspections need to be reviewed periodically to identify any common features and trends. Also, the frequency of inspection may need to be varied, depending on findings.

Audit

Audit is a formalized method of investigating a system's performance. According to HSG65, it is "the structured process of collecting independent information on the efficiency, effectiveness and reliability of the total health and safety management system and drawing up plans for corrective action."

There are two main types of audit. A 'systems audit' checks that necessary systems are in place, comply with legislation, guidance and good practice and are generally appropriate for the level of risk. A 'compliance audit' checks that the systems are being used and result in appropriate workplace precautions.

An audit cannot look at every element of a system, and so sampling is important. Some elements need to be checked more often than others, and it is bad practice simply to do the same audit every time. A useful concept is the idea of 'vertical' and 'horizontal' audits. A vertical audit takes a subject and sees how it fits into all elements of the health and safety management system from top to bottom (i.e. how it is covered by policy, organization, arrangements, measurement, audit and review). Whilst a horizontal audit selects one part of the system and considers how different items are addressed.

Any auditor should be able to act independently, so it is not normal for someone to audit their own system or compliance. However, internal audits can be carried out, typically by people from a different department from that being audited. These audits can be particularly useful at sharing best practice and learning through an organization, and the auditors usually have the benefit of knowing the systems very well, including known weaknesses (i.e. they know where to look for problems).

To ensure an audit system remains relevant it is usually necessary to carry out some degree of external auditing. This is a requirement for achieving defined standards (e.g. OHSAS 18001), and has the advantage of the auditors being fully independent. However, there is the obvious cost of external audits and the possibility that the auditor does not understand the industry and its risks, or the organization's systems.

Auditing is not always as successful as it should be and there have been some high profile examples of where companies have had major incidents shortly after apparently successful audits. Part of the problem is that organizations get to know what they are going to be audited on, and make changes to do well in the audit. This can be at the expense of other items that are more critical but not covered by the audit. For this reason it is essential that all auditors use their schedule as a guide, whilst taking every opportunity to fully explore all aspects of the system that they feel may be critical.

Driving improvement

Of course it is no good collecting information if nothing is done with it to correct deficiencies. Organizations need to review the information they have from all sources and act on it.

Setting targets

As with most things in life, setting health and safety performance targets can help improve performance by giving people something tangible to aim for and because they show that the organization is serious about the issue. However, setting targets can be fraught with problems. The obvious outcome we want from health and safety is that no one is harmed at work, but given that hazards always exist, risk management can only reduce the likelihood rather than eliminate it all together. But, setting what may be considered a more realistic target (i.e. something above zero) can give the impression that accidents are acceptable or that the organization is willing to compromise on safety.

It is possible to set reactive targets (e.g. accident, incident and ill health rates; claims, enforcement and complaints) but their use may be limited. It is probably much better to set targets for positive outcomes. Examples may be:

- Completing inspections and audits as per schedule;
- Implementing recommendations within a specified time scale;
- People completing training;
- People achieving competency standards;
- Achieving a recognized standard (OHSAS 18001, trade association award).

Problems in current practice

Many organisations still make no attempt at all to measure OS&H performance.

Among those that do, use of 'direct' indicators to assess 'safety output' (e.g. injury rates) has dominated to the exclusion of other indicators such as measures of 'safety climate' or various aspects of the safety management 'process'.

The measurement of OS&H management 'process' using audit systems leading to a score or ranking, is now more common, particularly in larger, high hazard organisations. However, it is still not widely accepted as a measure for setting meaningful and measurable corporate targets for improvement. Instead, the use of 'output' key performance indicators such as lost time injury rates tend to dominate to the exclusion of other such indicators as:

- 'Near misses';
- Unsafe acts and conditions;
- Environmental indicators (measurement of airborne contaminants, noise, vibration etc); and
- Work related health damage.

Generally speaking, performance assessment tends to focus on safety and exclude health considerations.

Common terms used to express 'safety' performance include:

- Numbers of accidental injuries per year;
- Rates of accidents per 100,000 employed;
- Frequency of accidents per million person hours;
- Days lost due to injury per year;
- Severity rate (ratio of major to minor outcomes);
- Estimated accident costs.

Lost Time Injury Rate

Many companies in the UK have adopted 'Target Zero' as a focus for health and safety performance and a motivator for staff. In such organisations, the length of time since their last 'lost time' or 'medically treated' work related injury is given special significance

as the principal indicator of success or failure in health and safety management. While many argue that every accident can be prevented, in reality, especially in very large organisations, some level of error leading to harm is probably inevitable.

The obvious limitation of a single focus on lost time injury rates is that it shifts attention of away from other unplanned events with the potential to cause injury, including 'near misses' and 'unsafe acts and conditions'. It also excludes injuries to persons not employed (e.g. the public). Furthermore, the exclusive use of lost time injury rates can be an extremely limited because it reveals nothing about whether the underlying management processes are appropriate or adequate. The real causes of prevention failure are invariably deeply rooted in the ineffective management of operations, which includes failure to control behaviour and change attitudes.

In its defence it is often argued that lost time injury rates are a simple measure that all workers can understand. Research suggests that there are predictable ratios or 'accident triangles' which describe the relationship between lost time injury rates and the incidence of events such as minor injuries and non-injury accidents [3]. The use of such modelling needs to be approached with caution: the ratios involved do not apply to all scenarios. In fact HSG65 [3] specifically cautions against this in relation to measuring effectiveness in managing major hazards. (For example, success in preventing slips, trips and falls does not automatically imply success in managing large toxic, flammable or explosive inventories!).

Also, whether or not an injury leads to lost time is affected by operational, economic and social pressures. Even in well managed businesses there are problems of under-reporting. There are many problems associated with the interpretation of changes in accident or injury rates. Accidents are low frequency events which require sophisticated statistical

analysis. Often this is not appreciated, leading to the mis-interpretation of changes in accident statistics, for example, when considering the incidence of accidents in small organisations. An informed observer would want to assess whether small increases in numbers of accidents are part of a more generalised pattern of health and safety management failure or whether they are within the limits of random variation.

A further criticism that can be levelled at the use of lost time injury rates as a single performance measure, is that, this ignores issues such as work related ill health and unsafe conditions such as the unacceptable exposures to health hazards. Health damage is generally a bigger issue than accidental injury but health performance indicators are harder to identify and quantify. HSE estimate that over 12,000 deaths each year have been caused by past exposure to hazardous working conditions [6] is at least one (if not perhaps two) orders of magnitude greater than death due to workplace accidents (although much of this occurs after those affected have ceased employment).

Some may seek to argue that good health and safety management which produces a low a lost time injury rate is more likely to address health protection as well. But an absence of accidents cannot be taken to imply a low rate of work related ill health since neither modelling nor data are available to support this. SBG O&M regard their sickness absence rates, in part at least, as an indicator of OS&H performance. However, most sickness absence is due to non-work related ill health.