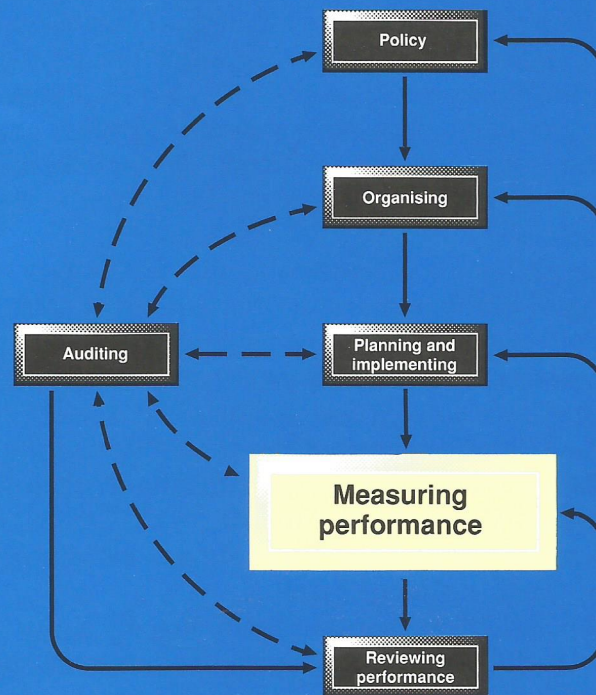


MEASURING PERFORMANCE



Synopsis

Measurement is an essential aspect of maintaining and improving health and safety performance. This chapter describes the features of:

- active systems which monitor the achievement of plans and the extent of compliance with standards; and
- reactive systems which monitor accidents, ill health and incidents.

Both systems generate information on levels of performance and effective systems of reporting, investigating, recording and analysing data are necessary to support them. The purpose and design of such systems is also examined.

MEASURING PERFORMANCE

A low accident rate, even over a period of years, is no guarantee that risks are being effectively controlled and will not lead to injuries, ill health or loss in the future. This is particularly so in organisations where there is a low probability of accidents but where major hazards are present. In such cases the historical incidence of reported accidents can be an unreliable, deceptive indicator of safety performance. In order to ensure that an organisation's policy is effectively implemented, the steps taken to develop a positive health and safety culture and to control risks need to be measured.

Organisations achieving success in health and safety measure performance against predetermined plans and standards, assessing their implementation and effectiveness in order to identify the need for remedial action. Monitoring activities also signal management commitment to health and safety objectives in general and are an essential part of developing a positive health and safety culture. Like planning, monitoring should be a line management responsibility and the arrangements should cover the whole range of health and safety performance standards which have been established. Two types of system are needed:

- active systems which monitor the achievement of objectives and the extent of compliance with standards; and
- reactive systems which monitor accidents, ill health, incidents and other evidence of deficient health and safety performance, such as hazard reports.

Both types of monitoring system need to be supported by procedures which ensure adequate investigation of the causes of substandard performance.

ACTIVE MONITORING SYSTEMS

Active monitoring provides essential feedback on performance before an accident, ill health or an incident. It involves checking compliance with performance standards and the achievement of specific objectives. Its primary purpose is to measure success and reinforce positive achievement by rewarding good work, not to penalise failure.

INSPECTION

A system for the inspection of plant and facilities forms an essential part of any active monitoring programme. It includes inspections and examinations which form part of arrangements for the preventive maintenance of plant and equipment. Many of these are legal requirements, including, for example: the thorough examination and inspection of pressure vessels, lifts, cranes, chains, ropes, lifting tackle, scaffolds, and supports for the sides of trenches; the thorough examination and test of local exhaust ventilation and air sampling to check its efficiency.

The inspection programme should, however, be more comprehensive than that, covering all areas and all relevant performance standards, and taking account of the risks involved in the work. Low

risks can be dealt with by means of general inspections of large areas and covering a wide range of issues, such as the general condition of premises, floors, passages, stairs, lighting, welfare facilities, and first-aid facilities. Inspections of this type might take place every month or two. High risks require more frequent and detailed inspections and closer examination, for example by means of weekly inspections of high risk plant and important control equipment. In extreme cases, daily or pre-use inspections and checks may be required as, for example, with pre-use checks on mobile plant.

Schedules should be drawn up specifying the frequency of inspections to satisfy specific legal requirements and to reflect risk priorities. These should be supplemented by inspection forms and check lists to ensure consistency and to provide records for follow-up action and further evaluation and analysis.

Managers should be given the responsibility for monitoring the achievement of those objectives and measuring compliance with those standards for which they and their subordinates are responsible. Successive levels of monitoring should reflect the structure of the organisation. Managers responsible for the direct implementation of standards should monitor compliance in detail. Above this immediate level of control monitoring can take the form of reports which demonstrate whether adequate first line monitoring is taking place. Such reports should be supplemented by an examination of a sample of monitoring activities to check the quality of the work.

The various forms and levels of active monitoring include:

- indirect monitoring of performance standards where managers check the quantity and quality of monitoring activities undertaken by their subordinates;
- procedures to monitor the achievement of objectives allocated to managers or sections by means, for example, of monthly or quarterly reports or returns;
- the periodic examination of documents to check that standards relating to the promotion of the safety culture are complied with, for example, that suitable objectives have been established for each manager; that these are regularly reviewed; that all training needs have been assessed and recorded; and that these training needs are being met;
- the systematic inspection of premises, plant and equipment by supervisors, maintenance staff or a joint team of management, safety representatives and other employees, to ensure the continued effective operation of hardware controls. Inset 14 provides further guidance on this aspect;
- environmental monitoring and health surveillance to check on the effectiveness of health control measures and detect early signs of harm to health;
- systematic direct observation of work and behaviour by first line supervisors to assess compliance with procedures, rules and systems - particularly when directly concerned with risk control;

Inspections must be undertaken by people who are competent to identify the relevant hazards and risks and to assess the conditions found. Full records should be kept of each inspection with details of both positive and negative findings.

When shortcomings are found the decision processes illustrated in Diagram 7 should be followed. These involve identifying any instances where immediate action is necessary; undertaking sufficient investigation to identify both the immediate and the underlying causes of the shortcomings; analysing and reviewing findings; planning remedial action; and setting such action in progress.

The design of inspection forms can help in planning and initiating remedial action by requiring those responsible for inspection to mark or rank

deficiencies according to their relative importance. A list summarising remedial action can also be used as the basis for a tracking system to check on implementation. Inspection forms should be analysed periodically to identify if there are any common features or trends which reveal underlying weaknesses in the health and safety management system.

As an organisation's understanding of its risks and their control develops, the frequency and depth of inspection may be changed to improve the monitoring process. This may involve the redesign of inspection regimes, inspection forms and check lists.

- the operation of audit systems, as described in the next chapter;
- consideration of regular reports on health and safety performance at main board level.

Monitoring effort should reflect the extent of the risks involved. Monitoring activities should be concentrated in areas where they produce the most benefit and lead to the greatest control of risks, so that high risk premises, plant, procedures and tasks are monitored in more detail and/or more frequently. For example, in a workshop with 50 procedures each containing one high risk task or element, it might be appropriate to monitor compliance by checking one procedure each week, thus covering all procedures within a year. The high risk elements might, however, need to be checked more frequently, say four times a year at a rate of four per week. A system would need to be established to ensure that these frequencies were being met.

Regular monitoring can sometimes usefully be supplemented by:

- random observation, including observation by senior managers on 'health and safety tours';
- questionnaire surveys of managers and other employees (possibly on an anonymous basis) to assess behaviour and attitudes towards health and safety;
- inspections by safety representatives or other employee representatives.

Active monitoring should provide the basis for decision making about improvements as well as providing a basis for rewarding good health and safety performance. Such reinforcement increases motivation to achieve continued improvements in performance.

REACTIVE MONITORING SYSTEMS

Reactive systems monitor accidents, ill health and incidents. They require the recognition and reporting of:

- injuries and cases of ill health;
- other loss events, eg damage to property;
- incidents (including all those which had the potential to cause injury, ill health or loss);
- hazards;
- weaknesses or omissions in performance standards.

Securing the reporting of serious injuries and ill health generally presents few problems for most organisations. However, the reporting of minor injuries, other loss events, incidents, and hazards may prove more difficult. In successful organisations the reporting of all events is promoted by:

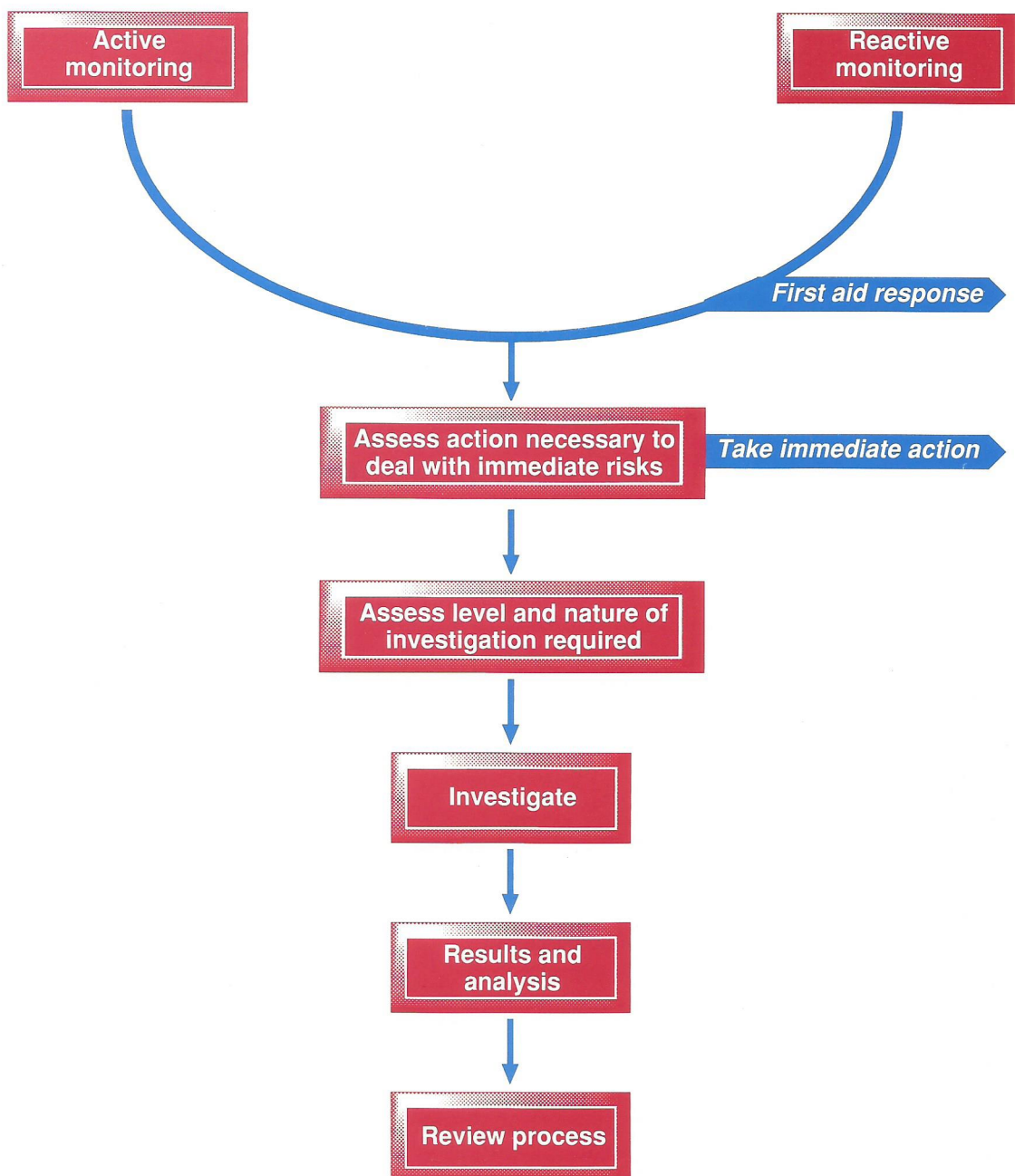
- training which clarifies the underlying objectives and reasons for identifying all relevant events;
- a culture which emphasises an observant and responsive approach and the critical importance of improving systems of control before harm occurs, and which encourages open, honest communication;
- cross referencing and checking first-aid treatments, health records, maintenance reports, fire reports and insurance claims, to identify any otherwise unreported events.

INVESTIGATION AND RESPONSE SYSTEMS FOR ACTIVE AND REACTIVE MONITORING

Systems are needed to ensure a consistent response to, and thorough investigation of, substandard performance. The results of investigations also need to be analysed and reviewed so as to identify common features and trends which might reveal areas for general improvement. These systems must be operated by staff with the necessary level of competence.

A common series of steps can be identified for responding to both active and reactive monitoring. These are summarised in Diagram 7 and are described overleaf.

Diagram 7



Actions necessary to deal with immediate risks

Information from both active and reactive monitoring systems must be evaluated promptly to identify immediate risks and to ensure that appropriate remedial action is taken without delay. The identification of such situations may require the use of a formal but simplified risk estimation technique (see Inset 12). Where there is a risk of a major incident the appropriate response would be the implementation of established emergency procedures or disaster management plans.

Level and nature of investigation

The level and nature of investigations should reflect the significance of the event being investigated. The greatest effort should be concentrated on those involving significant injuries, ill health or loss **and** on those which had the potential to cause widespread or serious injury or loss. Investigations should be designed to identify reasons for substandard performance, to identify underlying failures in health and safety management systems, to learn from events, and to prevent recurrences. Investigations are also necessary to:

- satisfy legal recording and reporting requirements;
- collect information which may be needed if the incident becomes the subject of legal action;
- collect information for potential insurance claims;
- maintain records for other purposes specific to the organisation.

Most investigations are carried out by line managers with health and safety advisers and technical staff acting in a supporting role, where necessary. Progressively more senior levels of management should be involved in investigating events involving more serious actual or potential consequences. In most serious cases investigation teams or boards, consisting of managers, specialists and employee representatives may be employed.

The form of investigation

Investigations should identify both the immediate circumstances and the underlying organisational causes. Recommendations should be made on measures to improve the management systems and performance standards.

KEY DATA TO BE COVERED IN ACCIDENT, ILL HEALTH AND INCIDENT REPORTS

The event

- Details of any injured employee(s), including age, sex, experience, training etc;
 - A description of the circumstances, including the place, time of day and conditions;
 - Details of the event, including:
 - any actions which led directly to the event;
 - the direct causes of any injuries, ill health or other loss;
 - the immediate causes of the event;
 - the underlying causes - for example, failures
- in systems of control; failures of management or supervision; lack of competence; inadequate training; inadequate performance standards; or failure to address human factor issues;
- Details of the outcomes including in particular:
 - the nature of the outcome - for example, injuries, or ill health to employees or members of the public; damage to property; process disruptions; emissions to the environment; creation of hazards;
 - the severity of the harm caused including injuries, ill health and losses;
 - the immediate management response to the

Investigation techniques should ensure that the whole circumstances are considered including human factors' issues and including:

- organisational aspects and systems, including relevant policies, standards, rules and procedures;
- the job, including the premises, plant, substances and procedures in use and their effect on the employee(s) concerned;
- the employee(s) including their behaviour, suitability and competence - along with the reasons for any deficiency in performance.

These aspects are illustrated in Diagram 8.

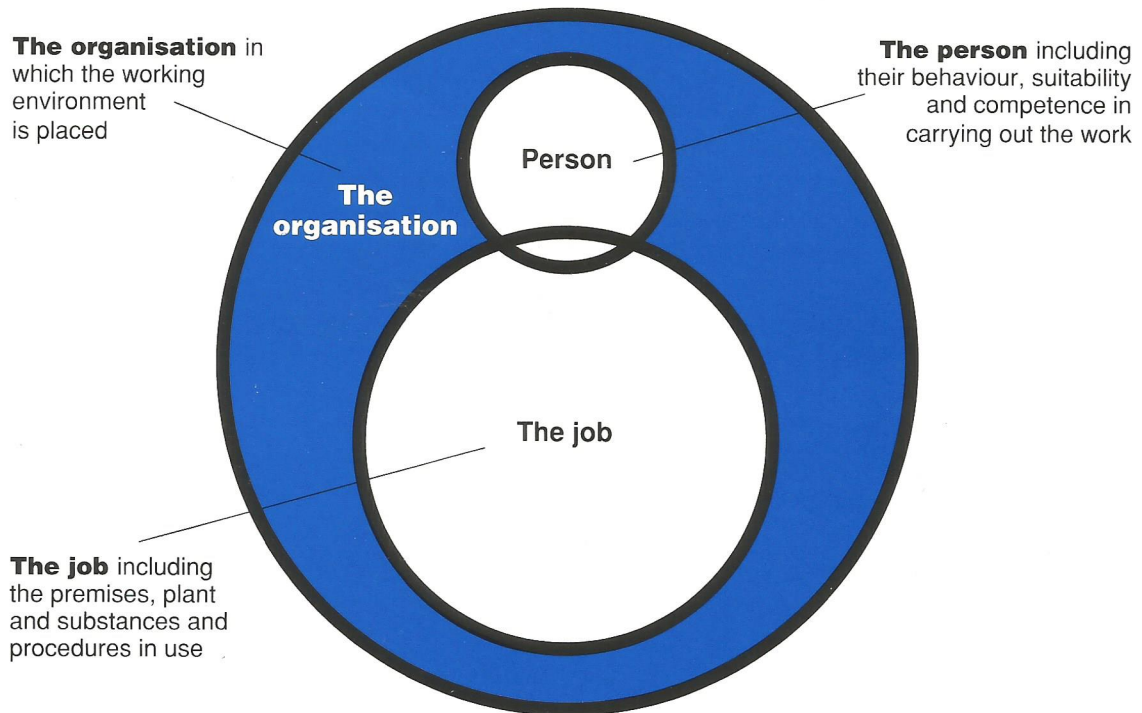


Diagram 8 Key aspects of investigation

situation and its adequacy (Was it dealt with promptly? Were continuing risks dealt with promptly and adequately? Was the first-aid response adequate? Were emergency procedures followed?);

- whether the event was preventable and how.

The potential consequences

- What was the worst that could have happened?
- What prevented the worst from happening?
- How often could such an event occur (the 'recurrence

potential')?

- What was the worst injury or damage which could have resulted (the 'severity potential')?
- How many people could the event have affected (the 'population potential')?

The investigation should consider, in particular, whether the management system was adequate to prevent the event occurring: if not, why not; if so, why did it fail? This involves:

- establishing the circumstances at the time of the event;
- comparing these with the relevant performance standards;
- identifying any inadequacy in the standards or disparity between the standards and the reality; and
- identifying the reasons for any disparity between the reality and the intention.

Results and analysis

The use of standard report forms can help to guide investigators through the processes outlined above. Forms should be large enough to accommodate all the relevant information and should include sufficient space to record clearly the causes of the event and recommended remedial action for each cause. Both the immediate circumstances of the event and the underlying organisational causes should be identified to enable judgements to be made by those responsible for authorising the necessary follow-up action. Forms can also be used as the basis of follow-up procedures to check that all necessary action is taken.

More generally, the recording system must:

- collect information accurately and present it in a consistent form;
- facilitate systematic analysis designed to identify common causes, features and trends which might not be apparent from the investigation of an individual event;
- record information which might foreseeably be needed in the future; it may also be useful for management purposes to record the time taken to undertake investigations and the related costs.

The content of reports may vary according to the type of event, but should generally cover at least the key data identified in Inset 15.

Coding and classification systems may assist in the analysis of collected data. Ideally these systems should provide for the correlation of different variables and analysis of both common features and underlying organisational causes. A number of proprietary computerised accident recording and analysis programmes are available which are designed to meet these requirements. Periodic reviews of report forms should also be undertaken to check that the remedial action identified has been adequate and appropriate.

SUMMARY

Organisations achieving success in health and safety measure their performance against pre-determined plans and standards, the implementation and effectiveness of which they assess as a basis for taking appropriate remedial action.

This leads them to establish, operate and maintain systems which ensure that performance is measured objectively. Such systems include:

- active monitoring systems which:
 - measure the achievement of objectives and specified standards;
 - reflect risk control priorities by concentrating on high risk activities which are monitored in more depth and/or more frequently;
- reactive monitoring systems which collect and analyse information suggesting failures in health and safety performance. These require systems for reporting:
 - injuries and cases of ill health;
 - other loss events, eg damage to property;
 - incidents (including all those which had the potential to cause injury, ill health or loss);
 - hazards;
 - weaknesses or omissions in performance standards;
- reporting and response systems which ensure that information from active and reactive monitoring is evaluated by people competent to identify situations which create an immediate risk to health or safety, and to ensure that appropriate remedial action is taken;
- investigation systems which ensure:
 - the investigation of reports arising from active and reactive monitoring, with priority being given to those circumstances which present the greatest risk;
 - the identification of both the immediate and the underlying causes of events;
 - the referral of information to the level of management with authority to initiate the necessary remedial action, including organisational and policy changes;
 - the adequate analysis of all collected data to identify common features or trends and initiate improvements.

FURTHER READING

- 1 *Inspection of industrial plant: a survey of quality assurance, safety and standards*
Pilborough L 2nd edition Gower Technical 1989
- 2 *Modern accident investigation and analysis* Ferry TS John Wiley & Sons 1988
ISBN 0 471 62481 0
- 3 *Your firm's injury records and how to use them* HSE IND(G) 113L
- 4 *Surveillance of people exposed to health risks at work: Principles and practice for the surveillance of people exposed to physical, chemical and biological health risks at work* HSE HMSO 1990 HS(G) 61 ISBN 0 11 885574 3
- 5 *Principles of health and safety at work* IOSH Publishing Ltd 1991
ISBN 0 901357 14 6