RISK ASSESSMENT AS THE KEY TO THE DEVELOPMENT OF A SAFETY MANAGEMENT SYSTEM

Grant Purdy
Pacific Risk Management
Melbourne, Victoria

Willie Vergeer
NOSA
Melbourne, Victoria

SUMMARY

How do safety management systems and risk assessments fit together? Which comes first? Can you use a template to create a safety management system, and what are the pitfalls? How do you create a good safety culture?

This paper seeks to answer these questions, from a practical point of view. It suggests that techniques such as safety audit, benchmarking, accident analysis and risk assessment are not independent, parallel approaches, but should be part of an integrated, 'holistic' strategy adopted by a company to manage the health and safety risks of its employees and others.

INTRODUCTION - THE PROBLEM

The language of safety today includes risk assessment, safety auditing, benckmarking, safety management systems and so on. These techniques are bandied about by practitioners and often one is left with the feeling that while all such techniques address the same aims, namely ensuring the health and safety of employees, they are all separate, alternative approaches. There is the danger of assuming that providing you do safety auditing, you do not need to undertake risk assessment or that benchmarking can be used to create a safety management system. How do these all fit together in the tool-kit of the company trying to reduce and control the risks to its employees? What is the correct order to tackle them and what are the common threads?

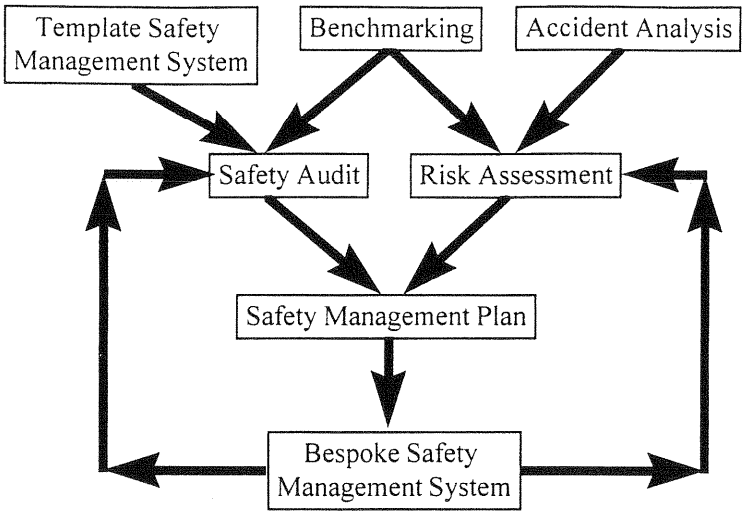
This paper tries to explain how these elements fit together, in particular, concentrating on the undertaking of risk assessment, and how, ultimately, a 'bespoke' safety management system can be created for an organisation which 'fits'.

The greatest problem we face is that no organisation just starts with a clean sheet of paper. There are remnants of old systems, there are the pet beliefs of its staff, and the pressures from external agencies such as consultants and government inspectors, all of whom have their preferred system or approach. The temptations to just 'buy-in' a quick fix are enormous, as most of the products available seem deceptively cheap. However, 'off the shelf' solutions rarely work for long unless there is a continuing investment of commitment and effort. What seemed a bargain, can soon appear a white elephant.

In the final analysis, many safety professionals now believe that a company should 'own' its systems for the management of occupational health and safety risks to succeed. Proprietary systems are very useful guides and templates in that they give a company a considerable 'head start' compared with producing its own, from scratch. The same is true of risk assessment methodologies. Many managers now also recognise that while systems and programmes are essential, they will not succeed, on their own, in enabling a company to successfully manage its risks. What is needed is the culture (change) at all levels in the work force and that that 'culture change' must be the end objective of all such approaches and devices.

This paper proposes that, if risk assessment is carried out correctly, and that if the right approach is adopted to the development of a safety management system, these will contribute to and stimulate the desired culture change. We therefore provide the solution up front, in Figure 1, showing how it all fits together. The rest of the paper is devoted, more critically, to practical suggestions as to how an organisation can make it work.

Figure 1 *How It All Fits Together*

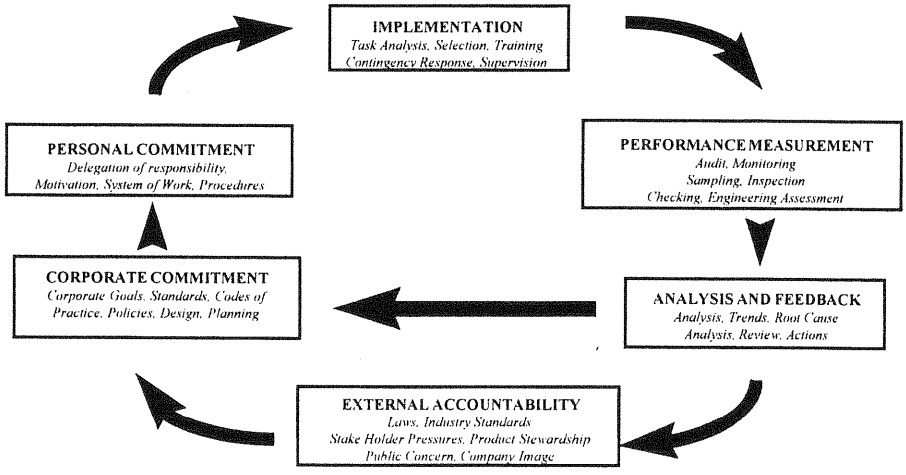


TEMPLATE SAFETY MANAGEMENT SYSTEMS

Figure 2 shows a general model of a safety management system. The ultimate goal of a Safety Management Plan should be to achieve all the elements of such a system, so that the cycle is created and sustained.

Most companies start on the left hand side by creating a policy statement and some establish performance goals and standards.

Figure 2 *Ideal Safety Management System*



These are then interpreted by the delegation of responsibilities through job descriptions, procedures and job instructions. They are implemented by ensuring that sufficient and suitable people are selected on recruitment, trained and supervised to carry out the required duties.
Here many companies stop, and the only stimulus for change is the pressures arising from the external environment and stakeholders. In other words, the company is not at this stage managing its own risks. More progressive companies check their compliance with their standards using safety audits, checks and inspections tailored and focused at the key hazards. But even here, some companies believe that just by the adoption of a 'system', their risks will be controlled and will diminish. The key to successful safety management lies in the final

part of the cycle, the analysis of the pertinent audit and inspection reports which leads to a thorough understanding of the underlying causes of potential losses and harm. The results from these analyses are then fed back in, to reset goals and objectives, to realign job descriptions and procedures, to update the training programmes and pre-employment selection criteria, and so on.

Once companies establish this progressive form of risk management, where they set the agenda and the performance goals, they can then 'disconnect' themselves from the external forces and use the results of their measurements and analyses to feed back out to the stakeholders, changing the way that they think and feel about the business.

The creation of such a system takes some time and this is where template systems such as the NOSA system can give a company a head start. This includes all the essential elements and comes supported with books, manuals and training programmes which help a company 'kick-start' the process. It also assists by providing the basis for help-groups, so that companies can swap experiences and solutions, and through regular support from third party safety auditing and benchmarking. Other, less detailed systems, such as those freely available from government agencies in Australia.

While all this help is initially useful, eventually a company's efforts will fail if there is no 'ownership' of the system, particularly by senior management. This syndrome is characterised by plateauing or worsening accident performance with occasional severe accidents such as fatalities. The solution is to take ownership of the system, to inject some vigour in the safety management programme, particularly by visible senior management involvement. One of the most powerful ways to do this, is by the adoption of a process of continuous risk assessment.

PRACTICAL RISK ASSESSMENT

Risk assessment is part of risk management, which is itself, a process of optimisation. Risk has two dimensions, consequence and likelihood. When we start to think in terms of 'risk' we begin to question not only 'what would happen if' but also, 'how likely is it?' When we start to think in terms of risk, and manage our companies in terms of risk, we automatically set up a system which begins to rank and prioritise our actions. This is one of the great virtues of risk assessment, in that it allows us to plan and programme our investments, allowing us to become proactive, to break the cycle of reaction, and thereby to control and manage our risks.

All forms of management involve 'optimisation', making the best out of what is available, including safety management. To achieve this, companies need to know the answers to certain questions:

- where do the risks to my employees and others come from;
- how big are they;
- what are the major contributors;
- what are the risks 'sensitive' to, and thereby, how can they be changed;
- what level of risk does the company (and the community) find intolerable, and what level could be considered negligible and trivial;
- therefore, what is it worth doing to reduce the risk?

In essence these are the steps to risk management, using risk assessment, whatever the risks may be.

The first, and most important stage in the risk assessment process is the identification of hazards. In other words, the adoption of some systematic way of allowing us to 'see' the hazards we face. If the hazard identification is not carried out carefully, then the subsequent analysis of risk and the development of risk control measures becomes pointless. The identification of hazards is not only an essential part of the risk assessment process, but also acts very effectively to change the way that people think, causing them to act more diligently and so become more proactive in hazard awareness. The way we conduct risk assessments can therefore have an important effect on changing a company's culture.

There are many techniques and tools that can be used as part of the hazard identification process. While visiting a location and seeing things more clearly, are valuable parts of hazard identification, it is also necessary to use a systematic approach to ensure a comprehensive and complete approach. There are a variety of tools available, from simple checklists through to the most sophisticated quantitative techniques, to assist the team in identifying the hazards. The team should agree the appropriate tools and approaches which they will use for hazard identification, in keeping with the scope of the exercise. Where necessary, the Safety Management professional should be able to advise and guide the team on the selection of the correct tools. He should also be able to advise them where additional training is required in the use of a technique or tool, before the team can proceed with the hazard identification exercise.

Proper analysis of past losses and incident is an important precursor to risk assessment. These are great benefits from extending such analysis to, so called, 'near-misses'. In any company, there are a larger number of near-misses than real losses, and thorough analysis of these can be very informative. However, this does require a near-miss reporting system and these are only effective in those companies where barriers such as a 'Blame Culture'

have been removed. The definition of 'hazard' as a 'potential for harm or loss' support the view that near-miss investigation is a powerful form of hazard identification. A near-miss is a revealed hazard.

Whichever method is adopted, the approach to hazard identification should be holistic, that is, it should not concentrate on one type of hazard but should be broadly based and should seek to identify all possible hazards to those at work or who may be affected by the work activities. For more complex hazards such as those associated with the introduction of radically new technology, or a business refocusing, it is necessary to deal with the many interactions of systems, environments and processes, in a systematic fashion. Of course, it is impossible to accurately predict all the combinations of circumstance and outcomes, however a thorough risk assessment before the changes occur can produce a comprehensive strategy which may include combinations of:

- revisions to the changes to eliminate some potential hazards;
- 'control at source' for some major hazards, to 'box them in;
- extra controls and safeguards being introduced to minimise the likelihood of losses; and
- mitigation such as contingency arrangements and plans to limit the consequences if something does goes wrong.

We have found that Safety Management Plans are best developed using participative risk assessment for reasons which will be amplified below. What is needed is a team, preferably drawn in a vertical slice through the organisation, a neutral facilitator, a dispassionate recorder and a system for hazard identification and risk ranking.

THE PROCESS

There are no fixed rules about how the risk assessment process should occur. However, there are some general principles that should be followed to ensure that it is suitable and sufficient. The assessment carried out will very much depend on the nature and extent of the hazards and risks. The process needs to be practical and involve management and employees, whether or not advisors or consultants assist with the process. Those involved in the risk assessment process have a duty of care to make sure that they and their colleagues do not make errors.

For a simple situations, where only a few hazards exist or the hazards are simple and well known, suitable and sufficient risk assessment can be a very straight forward process, based on judgement, which requires no specialist skills or complicated techniques.

When dealing with complex systems, more detailed and specialist techniques will need to be applied which actually quantify the levels of risk. In all cases, specialist advice may be necessary so that the team carrying out the risk assessment thinks as widely as possible in terms of the potential hazards, some of which they may be unfamiliar with. The preparation of the team carrying out the risk assessment is very important to ensure that they do not just ignore events because of their lack of personal experience.

> *It ain't so much the things we don't know that gets us in trouble. It's the things we know that ain't so"*
> *Artemus Ward (1834 - 67)*

In most cases, several risk assessments will need to be carried out for a particular location or activity. This approach will need to be carefully structured to ensure that all potential hazards are considered. The use of a systematic approach to risk assessment makes sure that all similar risk assessments produce the same results. The risk assessment process at a mine should be continuous and should not be regarded as a one-off exercise. While it will be necessary to establish a baseline, the requirements of the new act will not be satisfied by the creation of a single risk assessment report which stands for all time.

There are essentially three forms of risk assessment. All are part of a safety management system. These are (not in order of priority):

1 Baseline Risk Assessments

Mines have to assess where they are in terms of risk, identifying the major risks and thereby establishing their priorities and a programme for future risk control. This baseline risk assessment needs to be comprehensive and may well lead to further, separate, more in-depth risk assessment studies. The baseline risk assessment should be periodically reviewed, say every one to two years, to ensure that it is still relevant and accurate. Any other studies (see below) need to be incorporated to achieve the 'complete picture'.

2 Issue Based Risk Assessments

As circumstances and needs arise, separate risk assessment studies may need to be conducted. These will normally be associated with a system for the management of change. An additional risk assessment will need to be carried out when, for example:

- a new machine is introduced into a mine;
- a system of work is changed or operations alter;
- after an accident or a 'near-miss' has occurred;
- as new knowledge comes to light and information is received which may influence the level of risk to employees at the mine. An example of this is when the scientific knowledge about the toxicity of the substance changes and therefore previous risk assessment exercises dealing with that substance may be invalid.

3 Continuous Risk Assessments

This is the most important form of risk assessment which should take place continually, as an integral part of day to day management. It may not use the more sophisticated hazard identification and risk assessment tools which are deployed in Forms 1 and 2 (above), but in terms of ensuring safety and absence of health risks in the workplace, this form of risk assessment is the most powerful and important. It will mainly be conducted by front-line supervisors and it is essential that formal training is provided to enable this process to be efficient. Examples of continuous risk assessment include:

- audits;
- general hazard awareness linked to a suggestion scheme;
- pre-work assessments using checklists.

In this latter case, the checklists will need to be developed following risk assessment exercises such as those described in 1 and 2 above. One outcome of the risk assessment process can be the development of a checklist which deals with the critical parts and critical processes, concentrating on the key performance indicators which show the effectiveness of the underlying systems of control. Pre-work risk assessments are conducted daily, by the supervisor and the team from the area of work, in consultation with safety representatives.

The Guiding Principles For Risk Assessment

1 **Ensure that all the relevant hazards are systematically addressed**:

- aim to identify the major risks in the location or operation and not obscure those risks with an excess of information or by concentrating on minor risks;
- consider those aspects of the business such as the work process or the work organisation, which have the potential to cause loss or harm;
- take into account what risk controls and other measures already exist. The effectiveness of these controls needs to be carefully reviewed;
- be systematic in looking at hazards and risks. Remember that risk assessment is a process;
- ensure that all aspects of the work activity are reviewed.

2 **Address what actually happens:**

- actual practice may differ from what is supposed to happen in written instructions, procedures etc. This is frequently the way risk creeps into an operation unnoticed;
- especially consider non-routine operations and external changes. For example, maintenance operations and transport strikes;
- pay attention to interruptions or changes to business (equipment, methods of work and people) as these are a frequent cause of loss. Changes need to carefully managed.

3 **Consider all who may also be involved** such security guards, visitors and contractors.

4 **Critically assess the existing control measures and systems**. For example, codes of practice, procedures, special instructions and so on. These may have been adequate to reduce the risk sufficiently at one time, but they may not now be working properly or appropriate now. It is particularly important that this is objectively assessed;

5 **The level of detail should match the level of risk**. The purpose is not to deal with every minor hazard. A suitable and sufficient risk assessment reflects what might reasonably be foreseen;

6 **Start with a rough assessment to prioritise the risks**. Then, the second assessment can use more sophisticated techniques to deal with the major risks.

The outputs from risk assessment then form the basis for the company's Safety Management Plan. The risk assessment can create milestones so that the company and its stakeholders can track the progress of the change.

CULTURE CHANGE

To achieve successful organisational change, where the losses are controlled and the gains are optimised, requires cultural change. Tom Peters (Peters and Waterman, 1988) has stated that:

> *The basic philosophy, spirit and drive of an organisation have far more to do with its relative achievements than do technological or economic resources, organisational structure, innovation and timings. All these things weigh heavily on success. But they are transcended by how strongly the people in the organisation believe in its basic precepts and how faithfully they carry them out."*

Culture Change is also the desired end result of any safety management initiative. Tangible controls and systems have to be developed, but experience has shown that these will fail, unless they are in keeping with, and supported by the organisation's culture. This is a typical 'Catch 22' situation; the culture must support the systems, but the systems must support the culture, which comes first? The solution is to set up a cycle which continually reinforces the desired behaviours as shown in Figure 3.

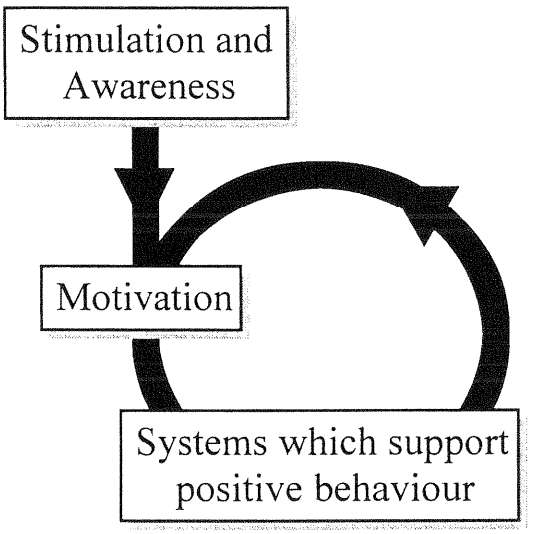


Figure 3 *The Three Steps to Culture Change*

Step 1 - Stimulate and build awareness

To kick-start the culture change, it is necessary to build awareness and increase stimulation. The team leading the change needs to develop a clear vision and strategy, which will act as the route map through the difficult times ahead. This strategy should be subjected to careful analysis and review, using the risk assessment techniques described above.

The use of a team is critical. This Steering Group should be carefully selected to be representative of all groups affected by the changes, should be respected by their peers and have an intimate knowledge of that part of the organisation they represent. The involvement of the team and the support of the workforce, in developing the vision and strategy, and undertaking the risk assessment builds 'ownership' of the process and results and cohesion within the organisation.

The members of the Steering Group are the primary agents for communicating with the rest of the organisation. The group has to work quickly to construct the vision and plan, to conduct the risk assessment and to prepare the Safety Management Plan. Communications with the rest of the organisation during this time have to be carefully managed so as to control rumours and to prevent early losses and the 'drifting' of key staff away from the organisation. Once the plan is ready, the member of the team must be fully involved in the communications exercise. Every vehicle possible should be used and the message should be consistent. All messages should:

- seek to stimulate attitude change;

- be given by a credible, trustworthy and knowledgeable communicator;
- be personally relevant;
- be instructive, but not paternalistic or lecturing;
- pertain to what individuals want to gain, or avoid;
- be careful in the use of humour;
- not contain any threats; and most importantly,
- encourage desirable behaviour.

Step 2 - Increase motivation

As the Safety Management Plan is launched, any risk controls should be implemented swiftly. Members of the Steering Group should set the norms for acceptable behaviour, so that a system of peer group pressure is established. This is the most powerful form of motivation. Those who conform to the plan, and therefore demonstrate acceptable behaviour, should be rewarded. This incentive, does not have to be monetary - often recognition and support can be even more powerful. Any such incentive schemes must:

- be fully supported by all the steering group;
- involve what most would accept is an attractive reward;
- progressively reward continued positive behaviour;
- have simple rules and widely perceived equity;
- start soon in the change process;
- reward groups as well as individuals;
- encourage involvement in the change process; and
- act to reinforce desirable behaviour.

One of the most powerful motivating factors, is to be part of the winning team. Devices and systems which increase cohesiveness, especially when coupled with involvement and empowerment can be very effective in motivating culture change. In particular, if the organisational change involves downsizing, this brings with it the need to 'multi-skill' remaining staff and, critically, devolve decision making down to grades who are not used to this. The end result is that many people who are not skilled in decision making, are now faced with risk-critical decisions. However, this can be tackled with very positive results.

One way of building cohesiveness, while developing empowerment is to encourage this decision making by providing simple-to-use guide, based on risk assessment, which allow people to come to screen the decisions according to risk, to take the lower and medium risk ones themselves, and to only pass up the high risk decisions. For example, change management systems for plant modifications often involve deciding whether the change is important enough to require a formal hazard study, and if it is, what form that study should take. Rather than passing such decisions up to a senior expert or a committee, many companies are now developing decision trees which screen the change in terms of potential hazard. If the potential hazard is small, a quick guide is used by the operator to assess the risks. The "3 Whats" is one example.

> *The 3 Whats*
>
> 1 What can go wrong?
>
> 2 What can cause it to go wrong?
>
> 3 What can be done to prevent it going wrong?

Step 3, Implement systems which support positive behaviour

So often, when a major cultural change initiative takes place, the company systems remain the same. All the improvements in culture are then lost as staff drift back to the old ways. Systems are totems which denote acceptable behaviour. No-one ever got sacked for following the 'System' - even if it was wrong. One of the primary outputs of the risk assessment, and the major components of the Safety Management Plan, must be the development and implementation of systems which support positive behaviour and are in keeping with the changes taking place.

Culture is often described as "the way we do things around here", or "the virus you catch when you join our company". Developing a good culture is no accident, it takes a great deal of time and effort. On the other hand, getting a bad culture is all too easy.

The right culture is essential to anchor the behaviours which are essential for future prosperity. However, culture is a 'floppy' thing which need the support of systems. These have to provide the 'shape' of the culture, by reinforcing positive behaviours and by denigrating negative ones.

CONCLUSIONS

What is clear, is that the creation of a good safety management system is not a quick, nor an easy process. A system which works cannot be just 'bought', it requires continuous investment of time and effort. Templates are available which will give a company varying degrees of assistance, from those which provide a broad outline, to others like the NOSA system with detailed elements and

comprehensive, ongoing support. For a safety management system to be effective:

- it should be 'owned' by the company;
- it should be sympathetic to and support the desired safety culture;
- that culture should be created, in part, by the manner in which the safety management system has been developed;
- it should be continuously assessed, tested and verified by safety auditing and risk assessment;
- it should be 'freshened' by external benchmarking and by feeding in the lessons learnt from the root cause analysis of accidents and incidents.

Good safety management is no accident.

REFERENCES

Peters T and Waterman R, 1988: In Search of Excellence: Lessons from the Best Run Companies, Warner Books, ISBN 0446385077