

# **POSITIVE PERFORMANCE INDICATORS FOR OHS**

## **BEYOND LOST TIME INJURIES**

### **PART 1- ISSUES**

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## FOREWORD

Participative management of health and safety is essential for productive workplaces and to developing and maintaining employee commitment to business objectives.

With remuneration increasingly tied to business success, the development of positive performance indicators (PPIs) is currently being discussed and debated by Australian industry. These new indices of workplace productivity need to be understandable to employees and reflect their contribution. Health and safety performance, with its consequences for the wellbeing and livelihood of workers and the efficiency and effectiveness of organisations, has to be part of such productivity measures.

The papers in these publications (Part I Issues and Part II Practical Approaches) record the proceedings of a Worksafe Australia workshop, *Beyond Lost Time Injuries*, held in Sydney in May 1994. Presenters and participants explored the reasons for moving from Lost Time Injury Frequencies (LTIFs) as the measure for OHS success to more positive measures.

International guests with expertise in the development of PPIs for OHS were among the 120 managers and OHS professionals at the workshop.

There was spirited debate about the value of Lost Time Injury Frequency Rates (LTIFRs) as a measure of OHS performance and how more useful measures could be developed. PPIs were strongly endorsed as the way ahead.

Debate showed that people are still grappling with how PPIs will work in practice. Developing enterprise-specific indicators poses difficulties for some. The majority, however, are of the view that though organisations can borrow ideas for indicators, the measures actually applied must reflect the culture and needs of the particular enterprise.

Worksafe Australia will continue to encourage the development and application of PPIs as part of an integrated approach to the management of health and safety at work.

Dr Edward A. Emmett  
Chief Executive  
Worksafe Australia



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Stewart Sweeney  
Elton Mayo School of Management  
University of South Australia



# BEYOND LOST TIME INJURIES: POSITIVE PERFORMANCE INDICATORS FOR OHS

## SUMMARY PAPER

Verna Blewett  
New Horizon Consulting

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What is the value of the Lost Time Injury Frequency Rate (LTIFR) as a measure of OHS performance? Are there more useful indicators and how can they be developed? What lies beyond the LTIFR and what are the Positive Performance Indicators of OHS performance?

This series of papers canvasses these issues and postulates some of the answers. The papers were originally presented at a Workshop sponsored by Worksafe Australia (WSA), *Beyond Lost Time Injuries: Positive Performance Indicators for OHS*, held on 19 May 1994 in Sydney. This summary paper is drawn from both the papers and the discussions held during the workshop which are otherwise not reported.

Participants at the workshop and the authors of these papers range from academics to consultants and workplace OHS practitioners. Despite the diversity of backgrounds, they all agreed that OHS professionals are facing an urgent challenge to integrate OHS into management systems. To do this, OHS professionals will need to reframe the approach of managers to OHS, to lift it to central focus from its current, peripheral position and to help managers see good OHS performance as a critical part of achieving best practice. A prerequisite of success for this goal is the existence and acceptance of a valid system for the measurement of OHS performance that can be used to support a program of continuous improvement in OHS at enterprise level. The participants at the workshop generally agreed that the LTIFR is inadequate to the needs of best practice OHS.

The potential for the LTIFR to cloud the perception of OHS performance and to give a misleading sense of security is acknowledged in these papers. The concept of Positive Performance Indicators (PPI), capable of showing improvement in process rather

than outcomes, is explored at length. It is clear that amongst OHS professionals there is an understanding that PPI can be developed and there is awareness that because they are linked to processes at enterprise level, PPI need to be enterprise specific.

The key ideas that were canvassed during the workshop covered the problems with the traditional measures of OHS performance, how OHS can be integrated into general management, the process of developing PPI and the role of OHS reform and legislation in supporting OHS best practice. Each of these areas is addressed below.

### PROBLEMS WITH TRADITIONAL MEASURES OF PERFORMANCE IN OHS

Lost Time Injury Frequency Rate has long been regarded as the standard for the measurement of OHS performance. It is designated in the Australian Standard 1885.1-1990 (Standards Australia, 1990) and has been adopted throughout the world as the standard indicator of OHS performance.

This thinking was challenged at the workshop. Dr Frank Rose, of ICI(UK), believed it to be fundamentally flawed:

"I really passionately believe that people have the right, the unchallengeable right, to go to work and to work safely and to not have their health damaged. And so, its totally unacceptable for me to see organisations or governments that budget for a certain number of fatalities, a certain number of lost time accidents, a certain number of medical treatments and a certain number of illnesses.

"If we are in the business of promoting OHS, why do we use failures as the measure of our success?" (Rose, 1994)

As Hopkins (ibid.) pointed out, LTIFR bears no relationship to injury frequency. His examination of accident data in the mining industry indicated that LTIFR data are far more indicative of changes in claiming behaviour and claims management than of changes in OHS performance. Bottomley (ibid.) categorised LTIFR as a traditional measure that has been superseded by PPI while Shaw (ibid.) provided a neat list of criticisms that are worthy of examination.

Special difficulties are experienced when LTIFR is linked to reward systems (Hopkins; Shaw, ibid). The most serious of these is the tendency for under-reporting of injuries by workers who are paid incentives for long accident-free periods. Claims suppression may occur for a number of understandable, but not always immediately obvious, reasons, for example changes in workers' compensation rules to the unwillingness to be the one to "ruin it for everyone" when an accident halts an accident-free period.

Although Rose (1994) advocated the abandonment of LTIFR as a measure of OHS performance, other participants at the workshop felt this stretched their corporate comfort zone too far. Some measure of outcomes (like LTIFR) may be necessary but is not sufficient Rose suggested,

"Lost time is abused. One of the things you could do if you want to improve it [is to] stop the practice of regarding people who come back into work to do some other job as not being lost time. ... If you cannot do your normal job fully it's lost time whether you come back in or not." (Rose, 1994)

Shaw examined the prospect that outcome measures like LTIFR may deserve a place in the OHS management system but she warns that they need to be balanced with other measures of performance. Problems with LTIFRs as a measurement of OHS performance reflect problems with traditional approaches to the measurement of productivity. The presentation by Roy Green described debates regarding the measurement of productive performance. Simple measures of productivity or

labour efficiency based on inputs, outputs and labour costs tend to be inaccurate because of measurement bias. The outcomes are highly dependent on the process and ignore the effect of issues such as OHS in production processes. Further, the conventional, historical accounting approach gives no information about what is happening today as it always measures past performance (Green, ibid).

Similarly a focus on outcomes in OHS performance measurement means that what is measured is largely a matter of chance as lost time injuries are statistically insignificant events, and if there is no loss there is no measurement; that is, much important data on near miss or minor outcomes incidents can be glossed over or lost (Hopkins, ibid).

## **INTEGRATION OF OHS AND GENERAL MANAGEMENT**

Recent changes in the approach to management as embodied in the best practice philosophy provide strong incentive to bring OHS into general management as a tool for change and as a springboard to other change. In organisations where OHS is integral to the matter of management it is clear that OHS needs to be built in on the basis of *other than* LTIFR. The focus on process in production needs support from the measurement of process. Archer, Bottomley and Nemeth de Bikal (ibid) each explored these considerations as they related to specific industries.

There is no one way to achieve integration of OHS into management systems or to provide positive performance indicators for OHS. In fact, to attempt to do so may mar the creative approaches taken by some companies which foster thinking about the issues.

The process of discovery is more valuable than a set of numbers which show 'convincingly' that all is well in the organisation.

One consideration is that PPI could be incorporated successfully into the payment of bonuses for performance based pay. For example, managers might be judged on how seriously they examine accidents or incidents in the area over which they



have control. One participant noted that performance pay tends to be based on the successful achievement of objectives that are written down and only those that are written down get attention. It is therefore important to include OHS objectives in the agreed objectives.

### **THE PROCESS OF DEVELOPING POSITIVE PERFORMANCE INDICATORS**

Despite the criticism of the use of LTIFR in the literature, it continues to be used in practice. Judging by the response to the workshop, this may be more as a result of lack of guidance on alternatives than any commitment to the use of LTIFRs. The outcomes of the workshop suggest that PPI need to be:

- implementation oriented - procedures, methods, resources;
- results oriented - products, outputs, outcomes; and
- related to process, be frequent events (to avoid statistical insignificance) and be relevant to the particular workplace. They may not be able to be generalised.

Shaw (ibid) suggested that PPI may not be precise; they may be designed around a cluster of performance indicators that meet the test of being accurate, simple and dynamic. They need to be indicators based on changes in the organisational culture. For example, Green (ibid) points out that they might be:

- an increase or decrease in percentage in a particular factor;
- the identification of a level of some sort that the organisation wishes to attain; and
- the establishment of a date by which some achievement is reached.

Of course, these data may be qualitative rather than quantitative. In the first instance it is important that a framework exists for the sympathetic development of PPI as well as the more effective use of negative PI. PPI are specific to enterprises and should not be used for legislative or inter-enterprise comparisons. There

is a world of difference between best practice and compliance with legislation as Bottomley elucidates (ibid).

The application of Statistical Process Control to data on injury rates or near miss incidents may give a clearer picture of points at which corrective action needs to be taken. This work is proceeding at ICI in Britain but is still in its early days and was reported by Rose (Rose, 1994).

### **OHS REFORM AND LEGISLATION**

Legislation is a necessary safety net to protect people from companies with poor OHS practice and to ensure that a bare minimum is provided. However, it doesn't cover all instances and can restrict best practice reform - for example, as one participant pointed out, what is the legal status of companies that have no supervisors? Legislation will have to follow to allow for these types of work organisation. The real challenge is to convince more companies to leave the shelter of the legislation behind and explore the value of OHS to their business (Sweeney; Shaw, ibid).

OHS legislation, however, can support the establishment of consultative processes which are a necessary part of OHS best practice. Consultative processes can bring about improvements in the working environment and can also be used to establish feasible and meaningful performance indicators. PPI thus established can be expected to help management and workers do their jobs better.

The adoption of a consultative approach to the development of PPI implies that the workplace culture is changing away from autocracy towards more participative management methodologies (Sweeney; Bottomley, ibid). This highlights an important effect improved OHS management can have on an organisation. Implementing OHS best practice can help improve management approaches in other systems as well.

The concept of continuous improvement is at the heart of best practice and can be put to good effect when applied to OHS in the workplace. The process of hazard management can be viewed as a continuous

improvement methodology and publicised within the enterprise to raise awareness and to encourage the implementation of more ideas as they arise.

In early 1992, the Department of Industrial Relations and the Australian Manufacturing Council published the report of the Overseas Study Mission into International Best Practice (DIR/AMC, 1992). The findings of the Mission were that the urgently needed new approach to management, best practice, had key elements. These are still acknowledged today:

- senior management vision and commitment to achieving change;
- the vision and strategy for change based on shared values;
- employee consultation and participation in the planning of change;
- a more effective use of technology;
- integrated and broadly-based training and education programs;
- the development of flexible organisational structures and processes;
- a culture of continuous improvement; and
- close links to customers and suppliers.  
(DIR/AMC, 1992)

Sweeney (ibid) described the use of research, or benchmarking to support these changes in management practice and to assist companies moving towards best practice. Shaw (ibid) tells us that effective benchmarking requires the identification of the key business processes to be benchmarked. This has important ramifications for the comparison of OHS between enterprises. It indicates a clear need for process benchmarking, which may be qualitative, rather than the benchmarking of quantitative, outcomes measures.

Although the literature on OHS benchmarking is scant, benchmarking is happening between companies. As one participant in the workshop put it:

"Talking about it is less effective than actually doing it."

Our knowledge of benchmarking, and management activities in general, tends to be empirically based so this statement tells us that there is a data base in industry waiting to be tapped. This is underway in the WSA Research Project "Benchmarking Methodologies in OHS" as reported by Shaw (ibid).

Auditing OHS should not be confused with benchmarking. Auditing is essentially an internal activity and is acknowledged as an important activity to ensure that hazards are appropriately managed at enterprise level. The effectiveness of auditing can have profound implications for the hazard management program in any organisation. As an important process in OHS management, auditing methodology could be targeted as a useful process to compare between companies as part of a benchmarking strategy.

## CONCLUSION

The main areas of discussion and interest that were visited during the workshop have been outlined above. Discussion was wide ranging and spirited. Some participants sought a ready-made solution to their PPI difficulties, however, the majority expressed the view that the process is as important as the outcome. It is important, nonetheless, to avoid reinventing the wheel. The conference reinforced the need to reposition OHS in the eye of general management. To do this will require passion and energy - two commodities not lacking in the OHS community; but essential for the breakthrough change that is required. It also needs a willingness on the part of OHS professionals to share their knowledge and give up their expert power. The undesirable effect of the OHS department can be to marginalise OHS in the enterprise and stall the integration of OHS into management systems.

Networking and sharing knowledge and information will be crucial to support these changes and enable a broad range of ideas to be canvassed. It will also be necessary at a national level to ensure an adequate

policy environment. There is an important role for WSA and others in the OHS community in networking effectively with industry policy making organisations such as the Australian Manufacturing Council, the Department of Industrial Relations, the Industry Commission, and the Australian Quality Council. This level of networking will ensure that OHS has a sufficiently high profile in the concept of best practice as it is delivered to industry. It is the clear role of the National OHS Commission to provide leadership in policy making and to provide resources to enable this to happen as a matter of urgency.

The final word must go to Frank Rose who said:

"... as a society, as companies, as individuals we analyse the wrong end of whether the performance measures will actually be valid and its just an excuse for not doing something. I think we need to get on and to measure some things and review them one or two years down the road and if they are no use then abandon them and move on. But do something to improve the inherent process; because until we improve the process the outcomes will still be hundreds of millions of people ill and injured each year." (Rose, 1994)

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# A POSITIVE ROLE FOR OHS IN PERFORMANCE MEASUREMENT

**Dr Roy Green**  
**Director, Employment Studies Centre**  
**University of Newcastle**

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The reform of product and labour markets in Australia has been accompanied by a strategy on the part of many firms and organisations to achieve world class performance. This strategy has been supported and encouraged by public policy, such as the federal Government's Best Practice Demonstration Program. It has also required the introduction of benchmarking and more sophisticated approaches to performance measurement so that organisations can evaluate their progress both in relation to other organisations and their own past performance.

While reference is often made in the strategy to the role of occupational health and safety (OHS) in improving performance, it is a sentiment which is not always translated into action at the workplace. This failure is reflected in the low status accorded to OHS in the design and implementation of performance measurement systems, which produces a reliance on 'negative' indicators, such as the lost time injuries frequency rate (LTIFR), and on 'quick fixes' to address fundamental problems in the production process or work environment.

This paper suggests a positive role for OHS in measuring the productive performance of firms and organisations. First, the paper sets out the economic and institutional context of labour market reform and the decentralisation of wage bargaining. Then, by way of contrast with the narrow, conventional approach to productivity measurement, it develops the broader concept of performance indicators in a 'Productivity Scorecard'. Finally, it proposes a new role for OHS performance indicators in the drive for organisational change and improvement at the workplace.

## WORKPLACE REFORM

Traditionally, productivity growth in Australia was measured at national level as part of the system of centralised wage fixing administered by the Industrial Relations Commission (IRC) and its predecessors. This entailed a statistical analysis of the growth of labour (or total factor) productivity over a given period, together with a calculation of movements in the cost of living. It resulted in national wage increases, which were permitted to 'flow on' to all occupations and sectors with award coverage according to the principle of 'comparative wage justice'.

However, just as the origins of centralised wage fixing were associated with the introduction of tariff protection (Plowman 1992), so tariff reductions and the collapse of Australia's terms of trade in the 1980's signalled the end of centralised wage fixing as the dominant source of pay increases. The consequent exposure of firms to international competition shifted the focus of both wage bargaining and productivity improvement to the workplace, with corresponding implications for the measurement of productivity and performance.

The shift of bargaining and productivity improvement to the more decentralised level of the workplace was not accomplished by deregulation but by a 'managed transition' under new wage principles devised by the IRC and parallel reforms to the legislative framework (Green 1994). The evolution of the wage principles proceeded in the following steps:

- *First*, the 1987 Restructuring and Efficiency Principle linked a proportion of wage increases to efficiency changes at the workplace. This principle introduced the concept of 'productivity

bargaining' but in practice lacked consistency of application and relied mostly on short term cost cutting by employers rather than longer term dynamic efficiency gains.

- *Second*, the 1988/89 Structural Efficiency Principle linked specified wage increases to the restructuring of Australia's whole system of awards. This principle contributed significantly to a new framework for workplace bargaining, and guided the design and implementation of multi-skilling, career paths, work reorganisation and training through consultative processes.
- *Third*, the 1991 Enterprise Bargaining Principle linked wage increases of any amount to changes designed to bring about 'real efficiency gains'. This principle for the first time permitted bargaining at workplace and enterprise level subject only to requirements set down by the IRC, including a single bargaining unit, a consultative mechanism and no wage undercutting.
- *Fourth*, the 1993 Enterprise Awards Principle again linked wage increases to changes to bring about real efficiency gains, but this time emphasised the need for implementation of those changes. While this principle is similar to its predecessor, it takes the process a step further and, in doing so, resurrects the IRC's power to arbitrate in disputes over enterprise bargaining.

The evolution of wage principles has been stimulated by, and reflected in, the reform of industrial relations legislation at both State and federal levels. The 1988 federal legislation introduced the 'certified agreements' procedure, which permitted enterprise agreements outside the formal wage principles. The 1992 amendments replaced the 'public interest' test for those agreements with the substantive requirement only that there should be 'no disadvantage' for workers, in addition to procedural requirements for joint consultation.

The 1993 Industrial Relations Reform Act is altogether more ambitious. While it reaffirms the role of the award system, the legislation has introduced an enterprise bargaining 'stream' under the supervision of a new Bargaining Division of the IRC. This stream encompasses not only certified agreements but also 'enterprise flexibility agreements', which may be concluded in workplaces with little or no union presence. There is also a new Industrial Relations Court and a limited right to take industrial action, as well as rights and protections covering minimum wages, equal pay, unfair dismissal and parental leave.

Despite these successive rounds of legislative activity, the progress of enterprise bargaining has been slow and uneven, with 1,750 ratified agreements covering 39% of employees in the federal jurisdiction (13% of all wage and salary earners) by March 1994 (DIR 1994), though survey evidence suggests that there may be as many again **unratified** agreements (Short et al 1993). Moreover, while around 40% of ratified agreements contain some reference to OHS, they tend not to integrate it into their workplace reform strategy (ACTU 1994: 3). This slow progress has been due partly to the dampening effect of the recession, and partly also to the degree of scrutiny exercised by tribunals under the public interest test, which is reflected in the accelerated pace of certified agreements after the 1992 amendments<sup>1</sup>.

However, a fundamental reason for the slow progress of bargaining has been the widespread failure to grasp what is meant by productivity, or productive performance, and how to measure it. The 1991 Australian Workplace Industrial Relations Survey (AWIRS) revealed that only 26% of workplace managers on the most generous assessment used any recognisable measure of productivity (Callus et al 1991), and the October 1991 National Wage Case decision noted "the absence of satisfactory proposals from the parties and interveners as to how "achieved productivity" should be measured and/or distributed" (AIRC 1991: 4, also AIRC 1993: 12).

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1. Paradoxically, however, the tribunal system has also facilitated the introduction of greater flexibility at the workplace (Green and Macdonald 1991), and the shift to certified agreements may simply reflect the tapering of the metals industry bargaining round which made almost exclusive use of consent awards.

## PRODUCTIVITY SCORECARD

Ideally, to be effective, the approach chosen to measure the performance of firms and organisations should fulfil three basic requirements. To begin with, it must be sufficiently **accurate** to capture all the elements of performance at the workplace, including safety performance. Second, it must be sufficiently **simple** to be understood and acted upon by managers and employees responsible for improving performance, and, finally, it must be sufficiently **dynamic** to encourage as well as measure the continuing process of organisational change and improvement.

The conventional approach to productivity measurement fails to meet these requirements. It is a statistical 'black box' based on narrow and misleading accounting concepts which attempts to measure the size of output per unit of input as follows:

$$P = Y/t (K,L)$$

where P is productivity, Y is output of uniform quality, K is capital stock, L is labour and t specifies the technical conditions of production. Even assessed on its own terms, this approach is flawed and unworkable for the management of change (Kearney 1991, Green 1993).

From the viewpoint of OHS and wider performance criteria, the conventional approach has four main defects. *First*, it assumes a single measurable product of uniform and constant quality, which excludes the role of **quality** as an ingredient of performance in its own right and abstracts from the more realistic scenario of multiple outputs or a stream of services (Green 1992). In other words, it is an approach more suited to the traditional model of low cost, high volume mass production than to the development of customer driven, high quality products and processes based on flexible specialisation and segmented markets.

*Second*, a 'single factor' ratio such as tonnes of steel per employee per year places the emphasis on reducing labour costs, especially in the absence of

significant variations in output, rather than on improving the efficiency and effectiveness of the organisation as a whole. This also highlights the narrowness of the conventional approach and the need for a 'total factor' or 'multi-factor' approach. Since "it is easy to increase the productivity of one factor by replacing it with another... effective productivity measurement requires the development of an index that identifies the contribution of each factor of production and then tracks and combines them." (Chew 1988: 114)

*Third*, recent theory and experience of workplace productivity bargaining suggests that performance outcomes are strongly influenced by the process by which those outcomes are generated, in particular by the "intensity of collaboration" between labour and management (Cooke 1989). A number of studies have shown that differences in performance may be due to "management's success or failure to structure relationships within production in a manner conducive to the achievement of high productivity and high profitability" (Nolan and Brown 1983: 282, Alexander and Green 1992). However, for the conventional approach these factors are simply 'background noise'.

*Fourth*, and finally; the conventional approach is an historical accounting device which measures only past events, rather than addressing current operational performance trends. Again, this limits the relevance of the approach for organisations whose strategy requires a tool not only for measuring performance but also for **driving** it. Moreover, "because traditional measurement systems have sprung from the finance function, the systems have a control bias". They "specify the actions they want employees to take and then measure to see whether the employees have in fact taken those actions. In that way, the systems try to control behaviour." (Kaplan and Norton 1991: 79)

By contrast, the notion of the Productivity Scorecard takes as its starting point not some preconceived equation or formula which abstracts from the activities which contribute to performance, but rather a set of indicators of productive performance which

are "relevant to the internal organisation of the firm and its strategic position in the product market" (Green 1993: 8). The purpose of these indicators is to link goals agreed at the workplace to the actions required to achieve them, to identify and facilitate the removal of barriers to the implementation of those actions and **only then** to measure progress towards the agreed goals.

It has been argued that the Scorecard approach embodies a 'fundamental change in the underlying assumptions about performance measurement'. This is because it is 'well suited to the kind of organisation many companies are trying to become'. Accordingly

"The scorecard puts strategy and vision, not control, at the centre. It establishes goals but assumes that people will adopt whatever behaviours and take whatever actions are necessary to arrive at those goals. The measures are designed to pull people towards the overall vision... This new approach to performance measurement is consistent with the initiatives under way in many companies: cross-functional integration, customer-supplier partnerships, global scale, continuous improvement and team rather than individual accountability." (Kaplan and Norton 1991: 79)

The Productivity Scorecard does not exclude indicators of financial performance but treats them as part of a cluster of operational indicators - 'the drivers of future financial performance' - relating to customer satisfaction, internal processes, the organisation's innovation and learning activities and, finally, the workforce contribution. Nor is it necessary to take a position in the debate in the management literature between proponents of 'results-driven' and 'activities centred' indicators (Schaffer and Thomson 1992), since the whole point of the Scorecard is to **integrate** activities with the specific results that they are ultimately intended to deliver.

Hence, the categories of productive performance encompassed by the Scorecard approach at least have

the potential to meet the requirements of accuracy, simplicity and dynamism set out above, and they also have the advantage of direct application to service activities as well as manufacturing<sup>2</sup>. These categories, which as we shall see offer a positive role for OHS indicators, may be presented in summary form as follows (see Figure 1):

1. **Customer Satisfaction:** This comprises indicators of timeliness (eg time to market), quality (eg defect levels) and service (eg value to customers), which are often as important as price.
2. **Internal Processes:** These link customer satisfaction to the internal strategies and decisions within the organisation, and include indicators of efficiency and effectiveness (eg cycle time).
3. **Innovation and Learning:** These measure the organisation's ability to develop new products and processes (eg percentage of sales from new products), and drive continuous improvement.
4. **Financial Results:** These include indicators of cash flow, sales growth, operating income, market share by segment and return on equity, and should reflect operational indicators.
5. **Workforce Contribution:** This measures not only the cooperation of employees with change and improvement programs, but also the initiatives taken to achieve agreed goals.

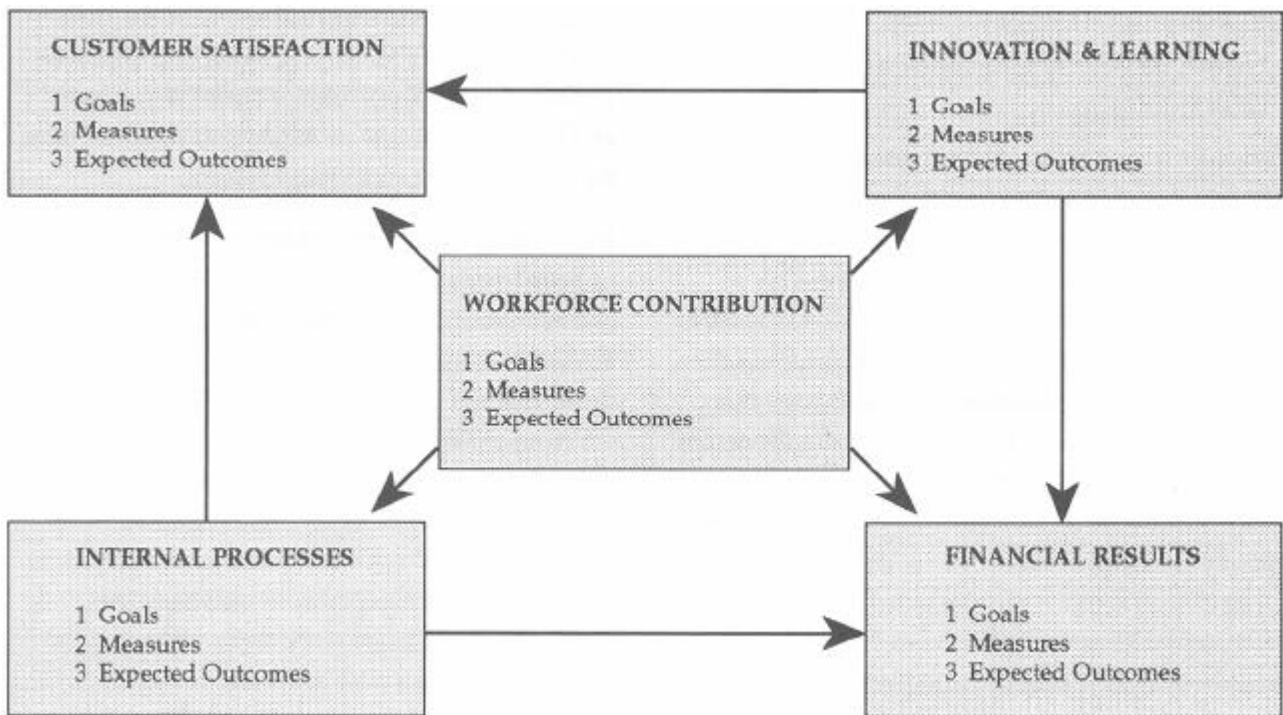
In sum, the Scorecard provides a framework for organisations to set goals in partnership with employees and unions, to develop indicators for measuring progress towards those goals and to reach agreement on expected outcomes in the context of a best practice approach to enterprise bargaining and workplace change. The categories of the Scorecard are broad enough to embrace the main elements of productive performance, and sufficiently precise to allow the formulation of reliable internal measures of performance and, where required, external benchmarking criteria.

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2. Whereas in the past services were equated to products for the purpose of productivity measurement, now all firms and organisations may be characterised as service providers: 'Manufacturing now responds much like a professional service industry, customising its offerings to the preferences of special market segments' Gaikumar 1986: 86).



**Figure 1**  
**Productivity Scorecard**



### **SAFETY PERFORMANCE**

There are two ways of developing a 'positive' approach to indicators of OHS performance within the scope and parameters of the Productivity Scorecard. The first is to place negative indicators, such as the accident rate or LTIFR, in the context of positive programs of change and improvement at the workplace, and the second is to devise positive indicators based upon a transformation of the workplace culture, technology and environment. Whichever option is pursued, it will be crucial for organisations to progress beyond the use of negative indicators in isolation from any mechanism for improvement, which would simply replicate the conventional 'black box' approach to productivity measurement<sup>3</sup>.

It is, as we have seen, a significant advantage of the Scorecard approach that indicators are linked not only to agreed goals but also to the mechanism or

strategy through which the goals are to be implemented. This means, for example, that if the accident rate were to be selected as an indicator of OHS performance, it would only be realistic and achievable in the context of a properly resourced program for reducing and preventing accidents (Ore 1992). In reality, for most organisations, the issue will not be which of the two options to pursue but rather which components of each option best fit the needs of the organisation and the change strategy it has adopted.

The most relevant category for measuring OHS performance is the 'Workforce Contribution', and it is here that organisations can supplement negative indicators with programs to eliminate workplace hazards and improve safety procedures and awareness, and can devise additional measures of workforce cooperation and compliance with these programs and procedures. More positive indicators may also be developed in the categories of 'Internal

3. The ACTU has recognised that, 'Development of productivity measures needs to include not just savings through reductions in lost time injuries and workers' compensation premium rebates, but also measures of the effectiveness of the health and safety systems established in the workplace' (ACTU 1994:8).

Processes' and 'Innovation and Learning', where organisations can measure the OHS dimension of work redesign, training, preventative maintenance and technological change (including ergonomic factors) as part of a wider commitment to continuous improvement.

However, it must be emphasised that an important factor in the success of this positive approach to measuring safety performance will be the ability of an organisation to go beyond an exclusive focus on indicators of employee behaviour, or even management behaviour, to encompass indicators which address the **total workplace environment**. These will range from generic indicators of the role, status and effectiveness of hazard reduction programs (such as those used in CIG's 'Process Safety Management' program) to more specific indicators of control procedures in place, action taken to meet agreed and/or required standards, the safety consciousness, morale and well-being of employees and the extent of workplace participation in safety issues.

The indicators themselves may take a number of different forms. First, they may measure a percentage increase or decrease in, for example, a negative indicator such as the accident rate or a positive indicator such as 'safety audits completed with a perfect (or near perfect) score'. Second, indicators may measure an absolute level or amount, for example, the 'hours of training per employee with an OHS content'. Third, they may record steps in the implementation of an agreed program by a specified date, for example, 'completion of Phase 1 of the XYZ hazard reduction program by October 1, 1994'. The practical viability of a performance measurement system will often be determined simply by its relevance to the individual circumstances of the workplace.

It follows that the development of OHS indicators in a global Scorecard with application to an entire organisation does not, and should not, exhaust the possibilities. As organisations devolve decision-making power and responsibility to cross-functional and self-directed work teams, there will be scope for the teams themselves, in the absence of traditional

line management structures, to design and implement Key Performance Indicators (KPIs) relating to their own goals and activities. These KPIs will mirror the categories in the Scorecard but will have the more specific purpose of identifying barriers to improved performance at a work team or business unit level, and ultimately the actions required to eliminate those barriers and bring about improvement.

It is in the nature of work teams that they will be part of a customer-supplier chain within the organisation, and hence that their activities will impact upon other teams just as the activities of other teams impact upon them. This will require new types of OHS indicators which emphasise the responsibility work teams have not only for their own safety but also for the safety of the members of **other** teams in the organisation, for example, through repair and maintenance programs and the supply of equipment or materials. The evidence on team-based work organisation suggests that this would be a more powerful tool for improving OHS performance than reliance solely upon individual responsibility.

The steps in the development of OHS performance indicators for an enterprise agreement might be as follows. First, there must be a partnership at the workplace between management and unions, both through the consultative committee and safety committee, which in turn must have access to key areas of decision-making in the organisation. Second, there must be agreement on global indicators in the context of a Scorecard approach to performance measurement, which should be based on wider consultation and communication with the workforce, as well as external benchmarking. Third, for organisations without teams, there must be a commitment in the agreement to devolve decision-making, including the formulation of KPIs.

In the short to medium term, organisations which pursue these steps will incorporate OHS into a Productivity Scorecard, ensuring that the workplace environment and decision-making process contribute to safety objectives and that these objectives are not contradicted by other performance goals and

indicators, such as narrow output or cost targets or 'engineered standards'. In the longer term, the evidence suggests that these same organisations may be expected to transcend the need for a Scorecard, or any system of performance measurement at all, for the implementation of best practice OHS will be built into the organisational culture of the workplace.

To conclude, world class organisations treat OHS, like training and equal opportunities, not as a cost but as an investment in the people who will give them a competitive edge in domestic and international markets. The role of performance measurement in this context is to integrate safety with the whole range of performance goals and indicators, so that organisations can not only match best practice but venture beyond it in the 'race without a finishing line'. The Productivity Scorecard offers a method rather than a rigid formula for setting the goals and the indicators of progress towards them. It gives OHS a positive role in the transformation of Australia's workplace culture.

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**OHS PERFORMANCE INDICATORS FOR BENCHMARKING  
REPORT ON THE LITERATURE REVIEW CONDUCTED AS STAGE 1 OF THE  
WORKSAFE AUSTRALIA PROJECT TO DEVELOP A BENCHMARKING  
METHODOLOGY FOR OCCUPATIONAL HEALTH AND SAFETY**

**Andrea Shaw,  
The Effective Change Consultants**

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The Worksafe Australia project to develop a Benchmarking Methodology for OHS is being conducted jointly by The Effective Change Consultants and Verna Blewett of New Horizon Consulting.

## **INTRODUCTION**

This paper outlines the findings of a literature review undertaken as Stage 1 of a Worksafe Australia project to develop a benchmarking methodology for occupational health and safety. The project is being conducted in 3 stages:

1. The conduct of a literature review.
2. A review of industry experience with benchmarking.
3. The preparation and piloting of practical guidelines to OHS benchmarking for use by industry.

The purpose of the literature review was to identify any reported impact of benchmarking on OHS management to date and to identify any key features for the future implementation of OHS benchmarking. The issues raised by the review, reported in this paper, will be used to inform Stages 2 and 3 of the project.

Literature related to benchmarking itself, OHS management and OHS performance measurement was reviewed. Well over 100 articles, papers, books and other publications were examined. Of these, over 65 were found to have relevance for the project. These are referenced in this report.

As expected, there were no publications of any kind which specifically addressed OHS benchmarking. A

number of benchmarking publications suggested OHS as a potential area to benchmark without providing any detail on strategies or possible performance criteria (other than LTIs). Similarly, several of Worksafe's own OHS Best Practice case studies briefly describe companies which undertake OHS benchmarking without much detail on how this has been implemented. Consequently, literature on OHS performance measurement was examined to develop a useful model for the guidelines to be developed.

## **BENCHMARKING**

Benchmarking is a process of "measuring your company's method, process, procedure, product, and service performance against those companies that consistently distinguish themselves in that same category of performance" (Watson, 1992, p. 5). As such, benchmarking involves the identification of key business processes to be benchmarked. In terms of OHS benchmarking, this requires that the processes used to manage OHS (OHS management systems) are benchmarked, rather than OHS performance standards per se.

The benchmarking literature to date has paid scant attention to OHS management as a possible business process to be benchmarked. The findings reported in Macneil et al (1993) suggests that few organisations currently undertaking benchmarking include OHS management as an area to be benchmarked. However, the approach advocated in the literature implies that OHS management is a suitable business process to be benchmarked.

The central text in this area is the *Benchmarking Self Help Manual* (NIES, DIR & AMC, 1993). This

Manual sets out a generic process for benchmarking with which the Guidelines will be consistent. A flow chart of this process is provided as an attachment. The extent to which this process is suitable for benchmarking OHS management will be tested in Stage 2.

One of the key messages of this manual is that only the most important business processes should be benchmarked. Two questions are proposed to assist in selecting business processes for benchmarking:

"Will your organisation's customers notice the difference if you implement best practice for this business process?

Will they change their behaviour significantly enough to make a visible impact on the reported results of the organisation?" (NIES, DIR & AMC, 1993, p. 31)

A checklist of features of business processes suitable for benchmarking is also provided:

"Those that

- are critical in meeting needs that are important to customers;
- take a large portion of the total resources of the organisation;
- are particularly costly sources of waste, rework or scrap;
- are the source of other problems;
- display the highest potential for improvement, based on current knowledge." (NIES, DIR & AMC, 1993, p. 35)

OHS in most Australian organisations clearly fits this checklist.

Another important reference, *The Benchmarking Workbook* (Watson, 1992), suggests that:

"Those key business processes affected by the current environmental situation are your primary candidates for benchmarking." (Watson, 1992, p. 34)

OHS regulations are explicitly included in Watson's description of the business environment. In his description of internal and external customers, Watson lists customers of the OHS management systems as:

"the OSHA, your local emergency services branches of government and hospitals and the local community residents around your facilities, as well as the families of your employees." (Watson, 1992, p. 36)

In summary, the central benchmarking literature pays scant attention to OHS management as a potential business process to be benchmarked. However, the benchmarking processes and approaches proposed are clearly consistent with benchmarking OHS management. The challenge for these guidelines will be to promote the value of benchmarking OHS management as part of a broader benchmarking exercise, as well as setting out useful guidance to suitable techniques.

## PERFORMANCE MEASUREMENT

While benchmarking OHS involves looking at management processes rather than outcomes, some way of measuring or assessing outcomes will be required. In other words, in order to benchmark OHS management, measurement of its performance will be required. This, in turn, will require the development of performance criteria or indicators. Literature on the development of performance indicators (PIs) was briefly reviewed to identify any relevant guidance.

Carter et al (1992) describe PIs as being of three types: dials, tin-openers or alarm bells (p. 49). In this categorisation, dials are prescriptive PIs - linked to objectives or targets. An OHS analogy might be the number of new employees trained in relevant OHS courses. Tin-openers are more descriptive, prompting more investigation and assisting in asking the right questions. An OHS analogy would be the quality of an organisation's OHS policy. Alarm bells are, as the name suggests, proscriptive, marking the occurrence of something which should never happen. The obvious OHS analogy is Lost Time Injury Frequency Rates (LTIFRs).

Carter et al argue that a good system of performance measurement needs a suitable balance between the three types of indicators. On this basis, OHS performance measurement to date has been unsatisfactory because of almost total reliance on alarm bell indicators. The next section outlines some of the cogent criticism of LTIFRs as a measure of OHS management performance.

The literature suggests that good performance indicators are:

- controllable or able to be influenced;
- relevant;
- assessable or measurable;
- understandable and clear;
- accepted as true indicators of performance;
- reliable, providing the same measures when assessed by different people; and
- sufficient to provide accurate information, but not too numerous.

(As well as Carter et al, 1992, see MTIA, 1992, and Shaw, 1992b).

## **APPROACHES TO OHS PERFORMANCE MEASUREMENT**

While benchmarking is undertaken on business processes, some approach to assessing or measuring performance is required, both to identify possible benchmarking partners and to measure or rate any improvements which are implemented as a result of benchmarking. In OHS, this is particularly fraught, because of difficulties associated with OHS performance measurement. In this section, a range of approaches to OHS performance measurement are reviewed to assess their suitability for use within an OHS benchmarking methodology.

### **Traditional Approaches to OHS Performance Measurement**

As already described, the traditional PI for OHS

management systems is Lost Time Injury Frequency Rate (LTIFR) or similar measures. While the focus of the literature is moving away from this measure, a remarkable number of articles still focus on PIs based on such measures. In particular, case studies, almost without exception, use LTIFRs and/or related measures as central measures of performance of OHS management (eg O'Neill, 1991, Gutteridge and Stiller, 1992 a b c, and Stewart, 1993).

Most of the theoretical literature provides major criticisms of the use of LTIFRs, eg:

"Accident data:

- Measure failure, not success;
- Are difficult to use in staff appraisal;
- Are subject to random fluctuations; there should not be enough accidents to carry out a statistical evaluation. Is safety fully controlled if, by chance, there are not accidents over a period?
- Reflect the success, or otherwise, of safety measures taken some time ago;
- Do not measure the incidence of occupational diseases where there is a prolonged latent period;
- Measure injury severity, not necessarily the potential seriousness of the accident;
- May under-report (or over-report) injuries and may vary as a result of subtle differences in reporting criteria; and
- Are particularly limited for assessing the future risk of high consequence, low probability accidents." (Amis and Booth, 1992, p. 44. See also, in particular, Haines and Kian, 1991, and Krause and Finley, 1993).

More sophisticated developments of the LTIFR model (eg Veltri, 1992, Sheehan, 1992, and Johnson, 1988) face similar criticisms.

These criticisms are not new. As Kletz (1993) states:

"I have worked in production and safety for over forty years and for the whole of that time most safety professionals have believed that the LTA [Lost Time Accident] figures have only limited value.... If senior managers pay great attention to the LTA rate and nothing else they are sending out the message that they do not really know why accidents occur and what should be done and, if this is so, safety cannot be very important... we obviously need some measure of performance in order to show up trends and compare one plant with another but no one parameter is adequate." (p. 409)

Clearly, the OHS Benchmarking guidelines to be developed will need to incorporate measures of the outcomes of OHS management systems. These must, however, be balanced with other measures of performance.

### **The Behavioural Approach**

Another significant theme in the literature is the measurement of OHS performance on the basis of individual behaviour. A number of articles advocate an OHS performance measurement system based on the development of standards of individual behaviour and performance, assessment of adherence to these standards (either by observation or self-reports) and feedback as to this adherence (see especially Barenklau, 1989, Chhokar and Wallin, 1984, Komaki et al, 1978, Sulzer-Azaroff and Feliner, 1984, Sulzer-Azaroff et al, 1990). The rationale for this approach is that unsafe behaviour causes accidents. Consequently, safe behaviour will prevent occupational injury and disease. Increased adherence to standards of behaviour therefore marks improved performance.

This model is based on theories of accident causation which stress behaviour rather than environment and system causes. Given the modern approach to OHS management which stresses 'safe place and safe system' approaches to risk control, such an approach to performance measurement would not be appropriate for the OHS Benchmarking Guidelines. It takes measurement one step back from system

failure (an injury or disease) but does not actually address the circumstances which allow unsafe behaviours to be manifested.

### **Attitudinal Surveys**

A number of papers suggested that attitudinal surveys can be used as one method of assessing the effectiveness of OHS management systems (Anonymous b,1992, Bailey and Petersen, 1989, Muir and Bailey, 1994, and Ojanen et al 1988). Such surveys reveal the 'safety climate' of an organisation, which is:

"one indicator of the operation of the workplace. It can be defined as perceptions which are shared by the workers and which concern the quality and actualization of safety-relevant activities and practices within the company.... It has been found that the perceptions of these activities relate to the accident rate of the company. " (Ojanen et al, 1988, p. 95)

This claim is supported by Bailey and Petersen, 1989, who further claim that surveys of such perceptions

"can effectively identify improvements in and deterioration of safety system elements if administered periodically. " (p. 26)

Given the modern approach to OHS management, based on participation and consultation, such perception surveys may have a role to play in OHS performance measurement.

### **System Auditing Approaches**

System auditing is advocated in much of the literature as an approach to monitoring and assessing OHS management systems. Auditing is an approach to checking and reviewing OHS management strategies. A large number of proprietary methodologies exist, particularly the International Safety Rating System and its derivatives such as the Five Star System of the National Safety Council of Australia. These methodologies examine the features of OHS management in place in an organisation according to a prescribed list and assess these against predetermined standards. Many papers reviewed



outline the features of OHS management to be audited in such systems (see, especially, Waterhouse, 1986 and 1992, Farnell, 1991, Wallace, 1991, Deacon and Pearce, 1992, and Anonymous, 1988).

Some criticism of such systems has been reported, particularly Eisner and Leger (1988), who question:

"the system's long checklists, the great detail required by some questions and the limited number of auditing staff.... [In the South African mining industry] there is no correlation between star rating and either fatality or reportable injury rates. A danger of the scheme is the degree of complacency it appears to have engendered." (p.141)

Such criticisms can be addressed by modifications to the auditing methodology used and, clearly, system auditing has an important role to play in OHS management. It is crucial for an organisation to check that OHS management strategies have been implemented effectively, in the same way that financial audits verify that accountancy practices are effective.

However, the simple adoption of one or more auditing systems as an approach to OHS benchmarking is not appropriate. Benchmarking is not system auditing - it is "the search for best practices that will lead to superior performance" (Watson, 1992, p. 5). These practices may or may

not be covered by an auditing exercise. A prescribed auditing system would not allow for creative variation or the development of specific benchmarks to meet the needs of individual organisations. Indeed, Sweeney (1992) argues that such systems are not even appropriate to assess the overall performance of OHS management systems:

"...these audit systems focus on program content, and attempt to quantitatively rate content against programs believed to be responsible for achieving superior performance.... However, design and structure or 'content' as used above is only one factor in determining overall performance." (p 95-96)

Nonetheless, auditing systems provide useful guidance as to aspects of OHS management which may be worthwhile to examine in a benchmarking exercise, along with other indicators of performance (see Appendix). The auditing process itself may well be a process an organisation may seek to benchmark.

### Process Safety Management

This approach is based explicitly on developments in management of quality in industry - Total Quality Management, Statistical Process Control and the like. Like system auditing approaches, it involves a focus on the system which gives rise to accidents rather than the accidents themselves. Krause and Finley (1993) provides the following representation of the safety management process:

**Table 1**

Culture	Management System	Exposure	End-Point
	Training		
	Safety management practices		
	Facility design		
Vision	Behavioural consequences: discipline, reward, feedback	Safety related behaviours	
Values	Accountability	Conditions	
Common goals	Priorities	Equipment	<b>INCIDENTS</b>
Assumptions	Resources	Facilities	
	Attitudes		
	Measurement system		
	Models		

Measurement of the performance of the OHS management system consequently requires assessment of the processes involved in the management system, rather than measurement of outcomes (such as incident and accident rates):

"Management of outcome instead of improvement of the system is destructive and is considered tampering" (Motzko, 1989, p.18).

However, unlike system auditing approaches, process safety management approaches to OHS performance measurement rely on continual monitoring of indicators of performance of the relevant processes and continuous improvement in these processes. Krause et al (1991) suggests some indicators which may be suitable candidates for such an approach. These are included in the Appendix.

Because of its clear consistency with other aspects of best practice and benchmarking, the process safety model for performance measurement appears to be the most effective model to adopt for the OHS Benchmarking Guidelines. This will be tested in Stage 2 of the OHS Benchmarking project - review and evaluation of industry experience and practice.

### **PRACTICAL EXAMPLES OF OHS PERFORMANCE MEASUREMENT AND BENCHMARKING**

The literature review examined a number of publications describing practical experience with OHS performance measurement and benchmarking. As described above, these almost all focussed on LTIFRs as a central measure of OHS Performance. Blewett (1992) describes the problems faced at Hendersons Automotive (SA) with such a reliance, particularly in relation to an associated incentive scheme.

Despite these problems, nearly all of the examples of OHS benchmarking reviewed used LTIFRs and the like as the major, if not only, benchmark. Of relevant examples from Worksafe Australia's own OHS Best Practice case studies (Gutteridge and Stiller, 1992 a,b&c), Australian Newsprint Mills' Boyer plant monitors its LTIFR against rates in North American competitors and Du Pont's Girraween plant compares its LTIFRs and related measures with Du Pont plants from around the world.

Perhaps the most sophisticated practical development beyond the use of LTIFRs can be found in Shell's TRIPOD system (Reason, 1991). Based on principles of process safety management, this system requires the ongoing monitoring of a range of indicators of potential process failures to limit the capacity of the system itself to create the potential for accidents.

These indicators are:

- "Incompatible goals
- Organisational deficiencies
- Poor communications
- Design failures
- Poor defences
- Hardware failures
- Poor training
- Poor procedures
- Poor housekeeping
- Poor maintenance (management)
- Error and violation enforcing conditions" (Reason, 1991).

One adaptation of this system, in Sarawak Shell Berhad, is described in Haines and Kian (1991). Potential incidents are assigned particular causes from the above list and the most prevalent causes are targeted for action over a period. As Haines and Kian note:

"This could lead to bias in assigning causes to give the appearance of progress but does result in a target for which directly related actions can be formulated" (p. 237).

A similar approach, explicitly based on statistical process control concepts, can be found in Barker (1994). This paper describes the approach to OHS benchmarking being undertaken by CIG. CIG identified the large range of variables associated with its loss control process. From these, seven key variables have been identified and performance criteria associated with them developed. These are summarised in the following table.

**Table 2**

<b>Key Variables</b>	<b>Performance Criteria</b>
1. Work environment	<ul style="list-style-type: none"> <li>• Manual handling improvements implemented</li> <li>• Improvements made as a result of risk assessments</li> </ul>
2. Levels of OHS&LC Programme achievement	<ul style="list-style-type: none"> <li>• Degree of compliance to Annual Operating plans</li> <li>• Self audits conducted to schedule</li> <li>• Auditable units involvement and progression</li> </ul>
3. Planned inspections	<ul style="list-style-type: none"> <li>• Hazards identified and rectified</li> <li>• Degree of compliance to planned inspection schedule</li> </ul>
4. Remedial actions	<ul style="list-style-type: none"> <li>• Completed on time</li> </ul>
5. Task training	<ul style="list-style-type: none"> <li>• Degree of compliance to Training Plan</li> <li>• Availability of training material for all tasks</li> </ul>
6. Occupational injury/illness	<ul style="list-style-type: none"> <li>• LWCR (Lost Work Case Rate)</li> <li>• TICR</li> </ul>
7. Motor vehicle accident rate	<ul style="list-style-type: none"> <li>• Avoidable Accident Rate – Cars</li> <li>• Avoidable Accident Rate - Trucks</li> </ul>

Once these have been tested within CIG itself, they will be used within a benchmarking process by CIG. Potential partners will be identified by their performance in relation to these key variables. Barker notes that "a benchmarking partner must offer CIG 'how to' information and therefore there is a need to benchmark more than failure (case rate) statistics" (p. 5).

A further example of this approach was provided in Dr. Frank Rose's presentation at Worksafe Australia's Positive Performance Indicators seminar. He reported the experience of ICI with OHS performance measurement. They have recognised the limitations of LTI-style measures and now monitor and benchmark six performance indicators:

1. Unsafe act tours carried out
2. Unsafe conditions tours carried out
3. Audits completed
4. Number of permits checked
5. Emergency exercises held
6. Training courses conducted (Rose, 1994).

Stage 2 of the OHS Benchmarking project (review and evaluation of industry experience and practice) will need to establish why LTIFRs and the like have been so central to OHS benchmarking so far and whether an approach based on process safety management like that of Shell, ICI and CIG would be more widely acceptable. The relative advantages and benefits of the various approaches will also be canvassed.

#### **CONCLUSION - IMPLICATIONS OF THE LITERATURE REVIEW FOR THE FUTURE CONDUCT OF THE OHS BENCHMARKING PROJECT**

The literature review revealed limited material on OHS Benchmarking directly but a growing literature on OHS performance measurement based on process management principles. Given the foundations of benchmarking itself in the continuous improvement focus of TQM, such an approach to OHS benchmarking is proposed for the Worksafe Australia project on OHS Benchmarking. This will be examined in Stage 2 by testing the suitability of such an approach with relevant workplaces.

Stage 2 will also need to determine why LTIFRs and related measures remain such popular OHS PIs. Is it because of a lack of a suitable alternative or is there a reasoned preference for such an indicator?

The potential range of OHS processes which could be benchmarked will also be canvassed in Stages 2 and 3. Consultation will need to identify whether the guidelines to be produced as a result of the project should provide:

- a 'smorgasbord' of possible benchmarks (as in Appendix);
- identification of a small range of 'essential' benchmarks; or even
- no guidance on specific processes but a series of steps to identify crucial OHS management strategies for benchmarking.

The Appendix will be used as the basis for consultation on this question.

Finally, and most importantly, Stage 2 will provide the opportunity for identifying reasons for inclusion or non-inclusion of OHS in general benchmarking processes. The Guidelines must be able to be used as a means of promoting the inclusion of OHS within broader benchmarking exercises as well as being a practical guide for benchmarking by those involved in OHS management.

The literature review shows that OHS benchmarking is beginning to occur, despite limited practical guidance from the theoretical literature. The Guidelines to be developed in Stage 3 of the project will therefore provide timely support for improvement of OHS management in Australian industry.

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## APPENDIX -BENCHMARKS PROPOSED IN THE LITERATURE

This table summarises the range of possible OHS management strategies for benchmarking suggested by the literature either as components of a system audit or key variables for performance assessment.

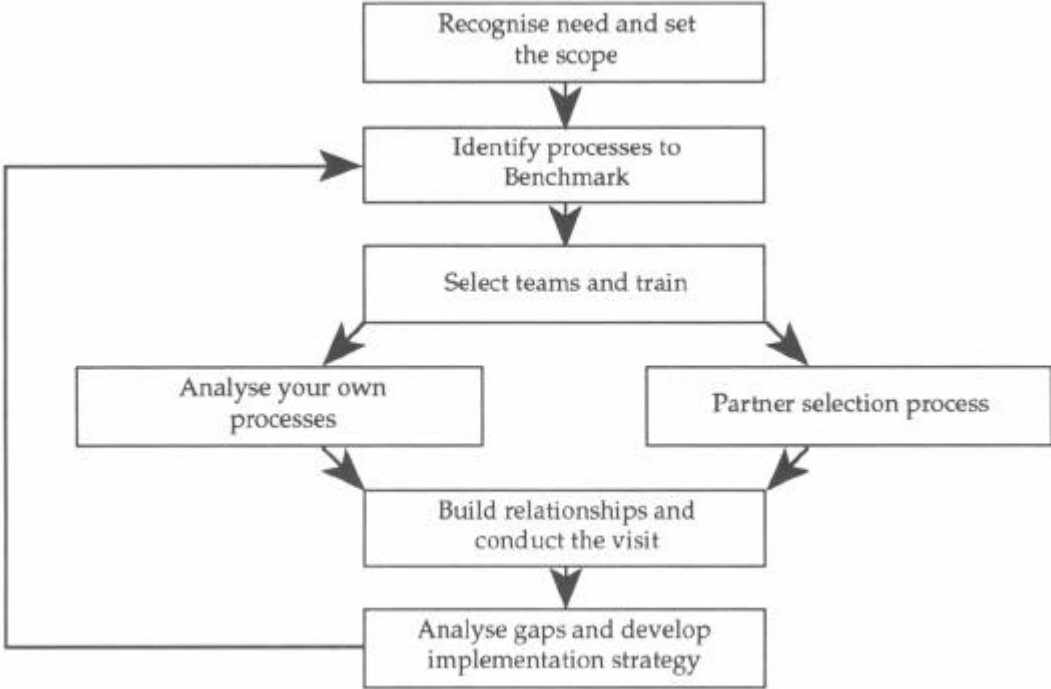
**Table 1**

<b>Possible Benchmarks</b>	<b>Suggested By</b>
Work environment	Barker (1994), Haines and Kian (1991), Reason (1991), Waterhouse (1986)
Levels of OHS program achievement	Barker (1994), Deacon (1992), Wallace (1991)
Inspections	Barker (1994), Rose (1994)
OHS training	Barker (1994), Haines and Kian (1991), Reason (1991), MTIA (1992), Sweeney (1992), Anonymous (1992), Waterhouse (1992) & (1986), Krause & Finley (1993), Rose (1994)
LTIFRs	Barker (1994), MTIA (1992), Krause et al (1991), Wallace (1991),
Supervision with respect to OHS	Haines and Kian (1991), Waterhouse (1986)
OHS plan and policy	Haines and Kian (1991), Sweeney (1992), Deacon (1992), Anonymous (1992), Wallace (1991), Waterhouse (1986), Krause & Finley (1993)
Work procedures and work standards	Haines and Kian (1991), Reason (1991), MTIA (1992), Krause et al (1991), Sweeney (1992), Anonymous (1992), Wallace (1991), Waterhouse (1986), Krause & Finley (1993), Rose (1994)
Engineering and design	Haines and Kian (1991), Reason (1991), Sweeney (1992), Anonymous (1992), Krause & Finley (1993)
Maintenance and inspection	Haines and Kian (1991), Reason (1991), Krause et al (1991), Sweeney (1992), Anonymous (1992), Waterhouse (1986)
Communication	Reason (1991), Amis and Booth (1992), Anonymous (1992), Waterhouse (1992),
Housekeeping	Reason (1991), MTIA (1992), Waterhouse (1986)
Participation and consultation	Krause et al (1991), Anonymous (1992), Waterhouse (1992) & (1986)
Accountability	Sweeney (1992), Waterhouse (1986), Krause & Finley (1993)
Process risk management	Sweeney (1992), Wallace (1991), Waterhouse (1992) & (1986)
Management of change	Sweeney (1992), Amis and Booth (1992), Waterhouse (1992)
Human factors	Sweeney (1992), Anonymous (1992), Krause & Finley (1993)
OHS system auditing	Deacon (1992), Waterhouse (1986), Rose (1994)
Management commitment and leadership	Amis and Booth (1992), Anonymous (1992), Farnell (1991), Waterhouse (1986), Krause & Finley (1993)
Legislative compliance	Wallace (1991), Waterhouse (1986)
Measurement system	Krause & Finley (1993)
Accident reporting	Waterhouse (1986)



ATTACHMENT

Figure 1  
Generic Benchmarking Process





# THE LIMITS OF LOST TIME INJURY FREQUENCY RATES

**Dr Andrew Hopkins**  
**Department of Sociology**  
**Australian National University**

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This paper is based on research carried out for a book on what it is that focuses management attention on job safety. The first part of the paper is a general discussion of lost time injury frequency rates and positive performance indicators, also known as process indicators. The second part is a case study of what can go wrong when LTIFRs are assumed to be a measure of safety performance.

## **PART 1 – OHS INDICATORS**

Lost time injury frequency rates are entirely unsatisfactory as measures of safety performance for at least three reasons. First, they are far more sensitive to claims and injury management processes than to real changes in safety performance. (This is demonstrated in the case study later in this paper.) Second, because in any particular workplace, only a few such injuries may occur each year, variations from year to year will be statistically insignificant, that is, likely to be the result of chance fluctuations, and thus no guide to changing levels of safety. Third, they tell us nothing about how well the most serious safety hazards are being managed. Copping (1993:1) provides a telling example of the inadequacies of LTI based statistics in this respect.

"After a run of nearly two years accident free a company employee slipped on a step and was unlucky enough to fracture a small bone in his foot. He was unable to work for several weeks and an LTI was recorded with a subsequent loss of safety awards to staff. At about the same time a container was dropped during an off-shore lifting operation. This latter incident had tremendous potential for injury but as luck would have it no-one was hurt. There is no doubt that the lifting incident was much more serious."

This passage not only demonstrates the inadequacies of LTI statistics but also highlights the negative consequences of using 'days since last lost-time injury' as an indicator of safety. The longer the period free of injury the greater the level of disappointment and frustration when a lost time injury finally occurs, which statistically speaking is bound to happen. This can lead to a profound sense of demoralisation and a sense of injustice (why should one injury cause a loss of bonus when the commitment to safety has been so exemplary?). The result may well be a reduced commitment to health and safety.

These are the major reasons which have led various commentators to advocate that LTI rates be replaced by or at least supplemented with other indicators. Some measure of "serious" injuries, for instance injuries resulting in long term disability, or perhaps the use of fatality rates, would overcome the claims management and claims suppression problems. Such measures might provide useful indicators of safety changes in whole industries. But because in any particular workplace serious injuries and fatalities are so uncommon, they would be even worse than LTI rates from the point of view of statistical significance and thus quite useless as tools for measuring changes in safety performance at particular workplaces. Statistics on dangerous occurrences or near misses suffer from similar problems.

Another possibility is to make use of statistics on the number of incidents which require medical treatment only but no time off work. Such incidents occur far more frequently than LTIs and so are less subject to random fluctuations than LTI rates. We saw in earlier chapters that occupational health nurses often keep records of medical treatments and these can

Provide information to management about safety performance. In particular these data can expose problems which may not otherwise come to light. On the other hand they give no indication about the potential for serious injury which may be present in the workplace.

A strategy which overcomes some of these problems is to use process rather than outcome indicators, that is, indicators which measure safety-relevant processes rather than outcomes such as injury or fatality rates (Copping, 1993). Process indicators will differ from workplace to workplace depending on just what processes are relevant. Moreover they must measure things which occur with reasonable frequency so that variations have a chance of being statistically significant and hence indicators of real change in safety performance. For example, if in a certain workplace hoses left unrolled result occasionally in workers tripping, and on rare occasions in a lost time injury, then counting the number of hoses left unrolled at any one time is likely to be a useful process indicator. If this count is repeated at randomly scheduled times, trend data can be rapidly built up.

It is important to distinguish between two types of process indicator: those which focus on the behaviour of employees and those which measure management activity. Consider, first, indicators of employee behaviour. Examples would include: the percentage of people wearing personal protective equipment, eg. hearing protectors, at required times; the frequency with which danger tags are being used as required; and measures of good housekeeping, such as rolling up hoses. One of the best features of such indicators is that merely publicising the data within the workplace focuses attention on the problem and is likely to lead to safety improvements without the need for more direct or punitive management intervention. Moreover the use of these indicators has the effect of involving people in the task of improving safety and creating a culture of safety. According to Whiting (1993:45), such indicators have the following advantages:

1. They are a sensitive indication of health and safety performance, enabling a workforce to detect whether safety is improving in a matter of weeks rather than months or years.
2. They are positive, focussing on how good rather than how poor safety is.
3. They are a direct measure of safety performance, focussing on how well personnel are complying with their own agreed safety responsibilities.
4. The results can be used as a powerful performance feedback.
5. They involves all workers and achieves "ownership".

There is however a significant drawback to such indicators. They are focussed on and aimed at changing the behaviour of employees, not managers. Yet it is managers who are ultimately responsible for health and safety and who are in the best position to take action on such matters. Hence the importance of indicators which measure the safety related activity of management. Examples here might include, depending on circumstances: percentage of workforce which has received safety training, or percentage of safety audits which have been completed on schedule. The general principle should be to have management specify its safety management plans and procedures and then to construct measures which assess how well these are being carried through in practice.

A deficiency of most process indicators, is that they tend to focus on behaviour, either of employees or of management. There is widespread agreement, however, that the most effective way to deal with hazards is not by altering human behaviour but by redesigning machines and systems of work so as to eliminate the hazards. The real challenge, therefore, is to devise indicators of the extent to which a firm has succeeded in eliminating safety hazards in this way.

The various indicators discussed above all have their strengths and weaknesses and OHS managers need to think carefully about the circumstances in which

each may be most appropriate. In particular, none of these indicators by itself provides a basis for designing systems of bonus pay for managers, since none provides a comprehensive measure of what managers are doing to improve OHS. Probably the best way to make such an assessment is to employ outside consultants to give an overall evaluation of the performance of managers, using not only the kinds of measurable indicators discussed above but also more qualitative data on how well safety is managed, the level of resources and attention devoted to OHS, the thoroughness with which accidents and dangerous occurrences are investigated, the willingness to redesign systems of work, the extent to which worker input is sought and responded to, and so on. Some safety consultants have quite complex systems for rating managers and one I interviewed produces a five point summary rating on managers ranging from A, the highest, to E, the lowest. One large company which employs this consulting firm told its divisional managers that they had to achieve a B rating within 12 months or face "career decisions". I was told that a group of managers was actually terminated for failing to meet this goal.

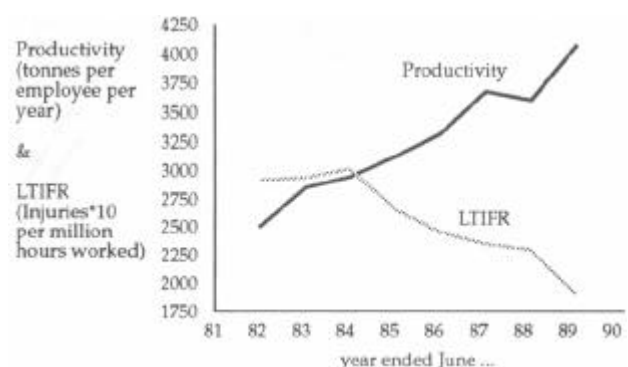
## PART 2 - IS PRODUCTIVITY RELATED TO SAFETY? THE CASE OF COAL MINING

Various commentators have recently argued that management attention to health and safety pays off in terms of higher productivity and hence profit. (eg. Oxenburgh, 1991; Mathews, 1993). The coal mining industry is cited in support of these claims, in part because of the very good data available from the Joint Coal Board (Mathews, 1993:49; Ore, 1992:8; Worksafe Australia Newsletter, Vol7 No 4 p4; Vol7 No 5 p2).

The argument has far-reaching implications for government strategy: it supports a policy of self-regulation and, taken to its logical conclusion, implies that there is no need for government-imposed regulation at all. All that the authorities need do is to point out to industry that safety pays in terms of higher productivity, and company self-interest can then be expected to do the rest. Given the importance of these implications, the argument deserves close scrutiny.

Some of data which apparently support the productivity claim relate to NSW coal mines over the decade of the 1980s and into the 90s. Figure one, which presents the data relied on by Mathews (1993:48), shows that during the period 1982-89 the lost time injury frequency rate, that is the number of lost time injuries per million hours worked, went steadily down while the productivity went steadily upwards.

**Figure 1**  
**Productivity and Safety, All NSW Coal Mines**

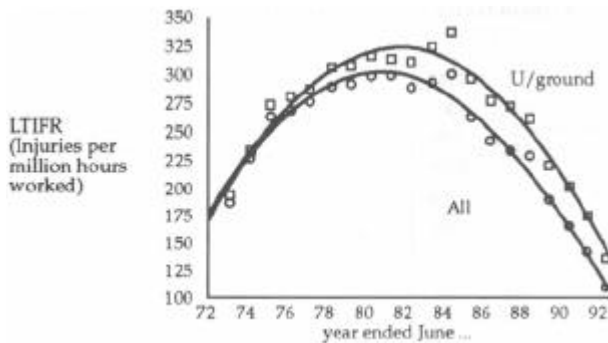


While it is undeniably true that there is a correlation between the safety performance and productivity during this period, the inference that improved safety performance led to higher productivity simply does not follow. In fact, there is no causal connection between the two variables at all. The easiest way to show this is to extend the period of the analysis to cover the decade of the 70s as well, as we shall do in a moment.

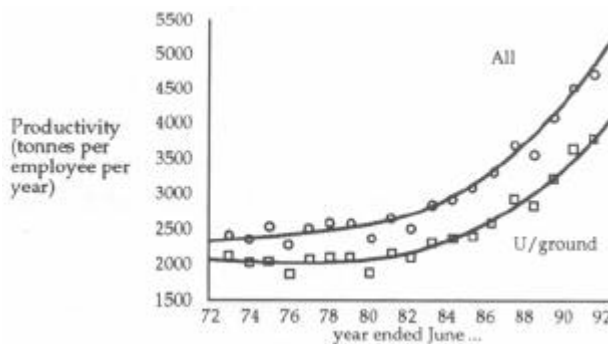
The figures used by the commentators cited earlier refer to all mines, both underground and open cut. Open cut mines use larger machinery and are thus more productive than underground mines. Moreover, the productivity trends over time for open cut mines are rather different from those for underground mines. The two types of mine should therefore be analysed separately. Furthermore, the great bulk of employment in the industry has been in underground mining and it is therefore underground mines which are of central interest here. Consequently, in later discussion we shall restrict our attention to underground mines.

However at this point, for the sake of completeness and in order to maintain continuity with other commentators, the data are presented both for underground mines and for all mines. The graphs which follow were constructed using data extracted from various Board publications, supplemented with unpublished data supplied by the Board.

**Figure 2**  
**Lost Time Injury Frequency Rates**  
**for Underground and All NSW Coal Mines**



**Figure 3**  
**Productivity of Underground and All NSW Coal Mines**



Figures 2 and 3 show that from 1972 to 1992, the LTIFR (lost time injury frequency rate) and productivity, measured in terms of output of saleable tonnes of coal per employee per year, followed unrelated trajectories.

Looking at the period 1972-82 we see a slight increase in productivity in all mines and no change in underground mines, despite a doubling of the LTIFR,

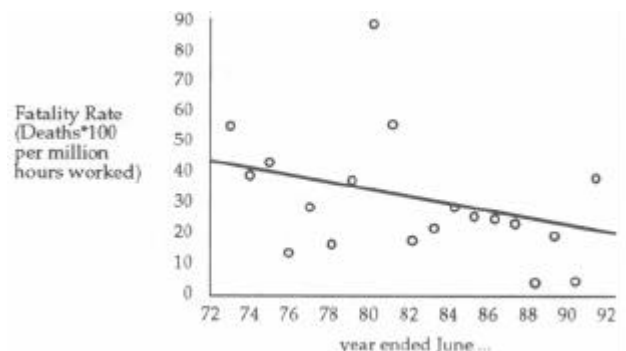
quite contrary to the presumed connection between safety and productivity. Furthermore, the LTIFRs in 1990 were almost exactly the same as they were in 1972, despite a doubling in productivity. Finally, it should be noted that, contrary to the safety pays hypothesis, the increase in productivity began in 1983, two years before the decline in LTIFRs set in. Looking at the data over this longer period makes it clear that it is highly doubtful that there is any relationship at all between the two variables.

But this is not the end of the matter. Although there may be no relationship between the two variables, their distinctive trajectories invite explanation. This will be done in the next two sections.

### Explaining the Lost Time Injury Curve

The shape of the LTIFR curve is particularly intriguing. At face value it suggests that mining became steadily more dangerous till about 1984 after which safety steadily improved. This seems a rather implausible interpretation. An alternative hypothesis is that the LTIFR is more a function of claiming practices and injury management and that these changed in various ways during the period under consideration. To help decide between these competing interpretations, it is instructive to examine the fatality frequency rates which are less ambiguously indicators of safety since they are not susceptible to variations in claiming practice and injury management. The number of deaths per million hours worked (multiplied by 100) is presented in figure 4.

**Figure 4**  
**Fatality Rates for Underground Coal Mines, NSW 1972-92**



Because of the relatively small number of fatalities the rate fluctuates wildly from year to year, the extreme case being 1979/80 when 14 men were killed in an explosion at Appin. However when a quadratic equation (a parabola) is fitted to the data it yields a straight line trend over the whole period. Note that fitting a quadratic would allow the curve to rise in the first decade and fall in the second, if that were indeed the trend in the data. On the basis of this indicator one would have to conclude that the level of safety has improved slightly but steadily throughout the period. This reinforces the view that the LTIFR curve is an artefact of other practices. Let us fill out this possibility in a little more detail.

With effect from 2 July 1973, miners sustaining accidents were entitled to compensation at the rate of full award wages plus the production bonus (Joint Coal Board, Acc. Stats, NSW Coal Industry, 1982-83, 1984, p9). Prior to this time weekly compensation payments were substantially below a miner's normal income. Prior to July 73, in other words, there was a substantial disincentive to miners taking time off work when injured; after that date there was no such disincentive. This is the most likely explanation of the dramatic rise in LTIFR which occurred between 1973 and 1975. From 1975 onwards the rate of increase slows, consistent with the hypothesis that it was the change in the compensation system and hence claiming behaviour in mid 1973 which was the principal cause of the rise which occurred in the decade of the 70s.

Let us note, before continuing, that this does not necessarily imply that the rash of claims after 1973 was in some way illegitimate, as some commentators have suggested. It is just as plausible to suggest that prior to the scheme's introduction men with genuine injuries felt compelled by the inadequacy of existing compensation benefits to stay at work when, from a medical point of view, they ought to have taken time off. It is not necessary to resolve this issue here, however. The point is simply that there was a change in claiming practices and that this is most probably attributable to the change in benefits.

It seems likely that the downwards trend evident since the mid 1980s is to a considerable extent attributable to improved injury management, of the type described at Eastern colliery. The Joint Coal Board has conducted seminars for colliery managers on how to reduce claims costs and it is well known in the industry that some of the best LTIFRs have been achieved by strenuous efforts to keep the injured at work, on alternative duties if necessary. One mine in particular which boasted no lost time injuries in one recent year also recorded 144 injuries without lost time during the same year. Joint Coal Board data provide evidence of the extent of this process. Between 1981 and 1992, the proportion of claims which resulted in lost time fell from 86 per cent to 56 per cent. (Joint Coal Board, Lost Time Injuries, NSW Coal Mines, 1991-92, p6). What this means is that, whereas in 1981 the great majority of reported accidents resulted in days off, by 1992 only half the reported claims resulted in lost time, the remainder being claims for medical and other expenses. The explanation for this is that workers who would previously have gone off work following an accident are now being given medical treatment and encouraged to come straight back to work on alternative duties, without any lost time.

It should be stressed that these comments do not imply any judgement about the policy of getting workers back to work on alternate duties. This may be good policy from many points of view, not least the injured worker's: it prevents the demoralisation which can sometimes set in when a worker is off for long periods. All that I am saying is that the conversion of lost-time injuries into injuries without lost time makes the LTIFR quite useless as an indicator of safety trends.

The preceding comments should also not be read as suggesting that there have been no safety improvements in the industry since the early 1980s. Joint Coal Board figures indicate a substantial reduction in the total number of claims, both lost time and non-lost time. The fact that claims for accidents which do not result in lost time (medical expenses only claims) are also coming down

suggests that there may have been real safety improvements. However, medical expenses claims may also have been affected by changes in management practices in this period, in ways that have not been explored here, which means that they, too, are an unreliable indicator of safety trends.

To summarise, it is unlikely that the remarkable shape of the LTIFR curve corresponds in any substantial way with safety trends in underground mines. The most likely explanation for the shape of the curve is the changes in the compensation system and in the intensity of claims/injury management which occurred over the period. This analysis provides a stark warning to anyone who seeks to draw inferences about safety from LTIFR data. These data are far more sensitive to changes in claiming behaviour and claims management practices than they are to safety, and variations in the data are likely to be indicative of changes in these practices rather than changes in safety.

### **Explaining the Productivity Curve**

Productivity, or output per worker, is sometimes naively assumed to be a measure of how hard a person is working. The fact is that the major productivity trends have nothing to do with the effort made by workers. The primary factor which influences output per worker is the technology in use, or more simply, the kind of machinery which he or she is operating. As mentioned earlier, the technology of open cut and underground mining is quite different and the productivity of the two types of mine must therefore be analysed separately. In what follows we look only at underground mines.

Underground mining during the 1970s was carried out by the pillar extraction method using continuous miners. By the end of the 1970s there was a widespread realisation that mining had reached a "technological plateau" (Joint Coal Board, Annual Report, 1981, p5). The beginning of the 1980s saw the progressive introduction throughout the coal fields of a new and more productive technology, long wall mining, and output per worker rose dramatically

wherever the new technology was in use. The details of this method need not concern us here; suffice it to say that it gave underground mining a new lease of life. The progressive introduction of long wall mining during the course of the 1980s corresponds exactly with the steady increase in productivity which the data reveal. This is the real explanation of the rise in productivity, not any increased attention to safety as hypothesised by the commentators mentioned earlier.

Moreover, the new technology is inherently safer than the old. It does not require people to work under unsupported roof and thus reduces the risk of miners being caught in roof falls. Further, it does away with the need for much of the heavy roof support work which miners had previously done. It may thus have led to some reduction in the rate of routine material handling injuries. It is likely, therefore, that the new technology has played some part in the reduction in the rate of lost time injuries which has occurred since the mid 1980s, although the effect is probably slight in comparison with the impact of changes in claims/injury management practices.

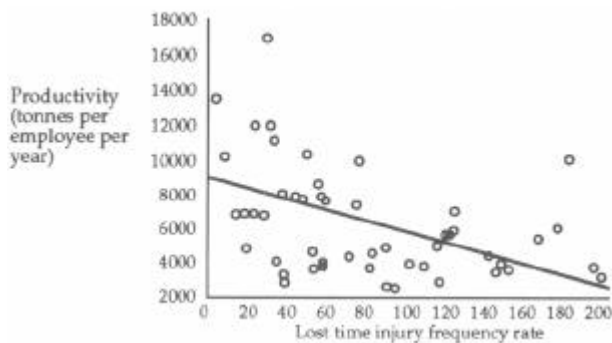
In so far as long wall mining may have contributed to a reduction in the injury rate it demonstrates an effect almost the reverse of that which the commentators hypothesise. Whereas they suggest that attention to safety will lead to greater productivity, what is apparent here is that the quest for greater productivity leads, at least potentially, to greater safety. Improved safety is an incidental by-product of increased productivity, not its cause.

### **Further Data on Productivity and Safety**

There is one other set of data which it is sometimes suggested demonstrates a relationship between productivity and safety in coal mining (Emmett, 1992:306; Mathews, 1993:49). If, for any one year, the productivity of each mine is plotted against its LTIFR, a correlation is apparent (see figure 5): the more productive mines tend to have lower LTIFRs. (Data taken from NSW Dept Mineral Resources, 1994:213-4 and Joint Coal Board, 1993, 10-12).

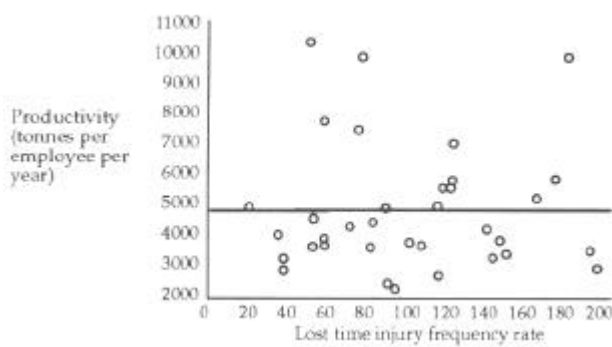


**Figure 5**  
**Productivity and Safety, All NSW Coal Mines, 1992-93**



But the relationship is misleading. It has already been explained that open cut mines are inherently more productive because of their mining methods. They are likely to have lower LTIFRs for similar reasons. Their presence in the data thus confuses the issue. Figure 6 shows the picture for underground mines only. These data reveal no relationship between productivity and safety.

**Figure 6**  
**Productivity and Safety, Underground NSW Coal Mines, 1992-93**



upon to generate safety incentives. Any policy of self-regulation which presumes that it can must fail. A strong argument can be mounted that it is existence of OHS legislation and the activity of the inspectorates which focus management's attention specifically on safety. The role of the inspectorates is vital, particularly in relation to the most serious hazards such as roof falls, gas outbursts and explosions, all of which generate relatively few LTI claims but which can result in loss of life, sometimes more than one life, when they occur. It is these occurrences which make mining a hazardous occupation and it is here that effective government regulation is critical.

**CONCLUSION**

This paper has demonstrated that the assumption that greater productivity in the coal industry is the result of greater management attention to safety is entirely false. There is thus no logical reason why managers concerned to improve productivity should turn their attention to improving safety.

The implications of these findings for OHS policy are profound. Company self-interest cannot be relied

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# OPPORTUNITIES/STRATEGIES AND TACTICS FOR GOING BEYOND TIME INJURIES

Stewart Sweeney  
Elton Mayo School of Management  
University of South Australia

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## 1. INTRODUCTION

This paper will provide a perspective on new opportunities to go beyond lost time injuries and other negative performance indicators. These opportunities have arisen primarily as a result of important changes around the world in thinking, policy and practice on achieving international competitiveness and effective organisational management. Some practical strategies and tactics for going beyond negative performance indicators in Australia will be identified and discussed.

Negative, cost based and short term performance indicators have long permeated enterprise, industry and national efforts to achieve competitiveness (Johnson & Kaplan, 1991). All areas of public and private sector policy and practice have been affected. In recent years, however, alternative evidence and perspectives have emerged on achieving sustained competitiveness (Porter, 1990).

The focus on competing primarily on cost as the basis of sustained competitiveness has been challenged by a focus on competing on quality and innovation. As a result positive, quality and innovation based performance indicators have emerged as essential tools for a strategy to achieve sustained competitiveness. Private and public sector policy are slowly and unevenly changing to incorporate elements of the new thinking and implement new practices.

Similarly, the dominant paradigm of organisational effectiveness based on maximum division of labour, hierarchy and centralisation has been challenged by more flexible, decentralised and participative structures. As a result there is an increased emphasis

on the need for positive performance indicators to measure organisational effectiveness (Kaplan & Norton, 1992).

This fundamental transition in policy and practice provides opportunities both for OHS positive performance indicators to be developed and for the OHS contribution to competitiveness and organisational effectiveness to be better reflected in mainstream positive performance indicators. There are opportunities to reposition OHS, along with other areas of reform, within a changing, more dynamic and more open paradigm of competitiveness.

Along with the new opportunities there are new challenges, but perhaps above all there are continuing contradictions.

The fundamental nature of the contradictions is highlighted firstly, by the emerging evidence that the development of sustained international competitiveness is enhanced by stringent and anticipatory regulations and standards that are rapidly, efficiently and consistently applied (Porter, 1990: 647). This evidence runs counter to the still dominant conventional wisdom in Australia and elsewhere which supports deregulation. It runs counter to much recent thinking, policy and practice in OHS.

Secondly, contradictions are raised by issues and questions relating to the extent of genuine empowerment inherent in the new organisation structures. The expected improvements in productivity are unlikely to be sustained if the worker empowerment upon which they in part rely, is found to be a sham or simply inadequate.

It will require both continuous improvement and breakthrough improvements to produce the kind of changes and results still required in OHS. This in turn will require both highly effective legislation, regulations, standards, institutional arrangements and practices and effective campaigning, networking and political and industrial struggles.

## 2. SOME PRELIMINARIES

### The Evolution of the OHS Agenda

It is over twenty years since the current phase in the development of the OHS agenda commenced. Key developments in that time have included national and state legislation, the establishment of new national and state agencies to deal with OHS, the emergence of national standards and the emergence of workplace based OHS representatives.

The OHS agenda has followed the classic trajectory of reform agendas. A period of struggle for recognition, a period of growth, achievement, maturation and now the challenge of avoiding counterproductive institutionalisation. Much has been achieved but even more remains to be achieved. Annual deaths in Australia remain at over 500; annual new injury and disease cases involving five days or more off work are close to 200,000. The Mesothelioma Register maintained by Worksafe Australia records at least 300 new cases of this fatal occupational disease each year (Worksafe, 1993b).

### A Framework for Policy and Practice

In proposing to go beyond negative performance indicators, particularly lost time indicators (LTI's), it is not being implied that LTI's are not important. The ongoing role of LTI's is summarised in the series of propositions outlined below:

1. LTI's are necessary but not sufficient.
2. Better LTI's plus positive performance indicators are better but not sufficient.
3. Best LTI's plus better positive performance indicators are even better, but still not sufficient.

4. Best LTI's plus best positive performance indicators are even better, but still not sufficient.
5. Best LTI's plus Best positive performance indicators PLUS new networking and effective campaigning, political and industrial struggle might just be sufficient.

These propositions will be developed and clarified throughout this paper. However a few points of clarification may be useful at this stage.

Firstly, the overall objective implied but not directly stated above by the word 'sufficient' is that there must be sufficient change to produce substantial and sustained reduction in deaths and injuries in the workplace and lifelong improvements in workers' health.

Secondly, there is no escaping LTI's nor should there be. It is specifically proposed above that it is a combination of LTI's and positive performance indicators that will in the end have the biggest impact on reducing lost time injuries.

Thirdly, both LTI's and PPI's can and must be continuously improved.

Finally, it is worth repeating that it is the combination of the best performance indicators and new networking, campaigning, political and industrial struggles that might just be sufficient to achieve the required improvements in occupational health and safety.

### Networking, Campaigning, Political and Industrial Struggles

The breadth and depth of change still required in occupational health and safety reform remains more than merely an institutional and technical issue and more than a debate about matters such as performance indicators. There are areas that are changing too slowly and there are areas of necessary change that are not yet even on the agenda.

It is certainly important to maximise areas of agreement. It is even more important to recognise areas of disagreement and the legitimacy of

campaigns and struggles to achieve change in such areas. There has been over forty years of debate about the apparently technical issue of going beyond lost time indicators with little to show for it (Rinefort, 1992). Even in the context of the new opportunities now available, networking and campaigning, if not political and industrial struggle, will be required to make a breakthrough on positive performance indicators.

### Input and Output Performance Indicators

In considering negative and positive performance indicators and their role in OHS, it is useful to use a simple input-process-output model of enterprises to provide a clear picture of the different uses of the terms. In particular, it is important to recognise the role of positive performance indicators in both the input-process and the output parts of the model.

For example, in the input/process part of the model positive performance indicators could include:

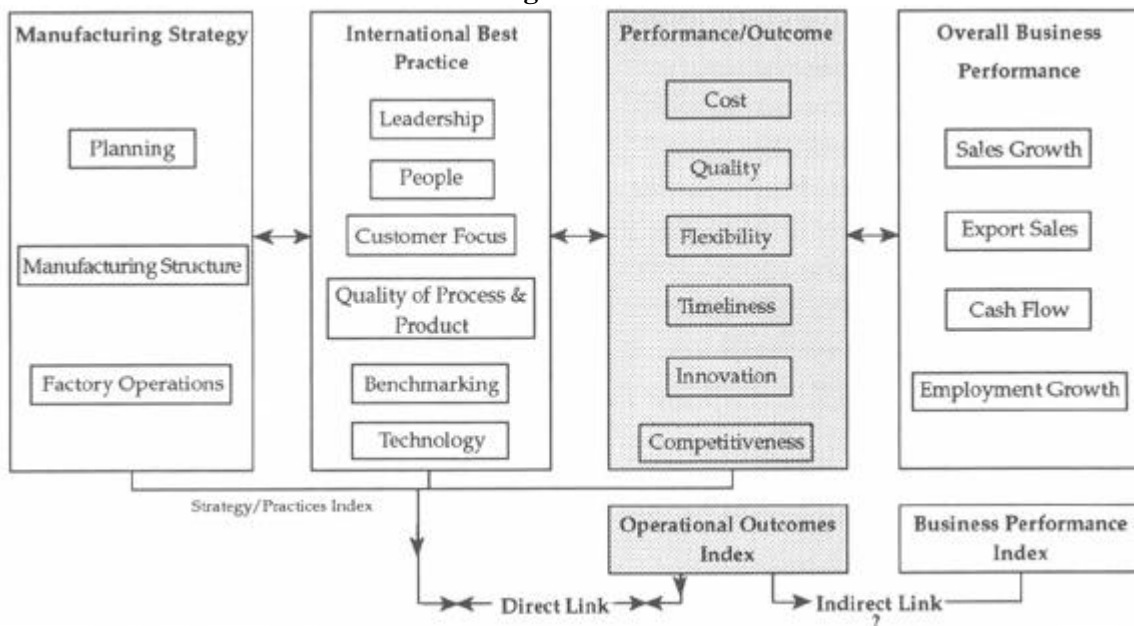
- effectiveness of training programs;
- effectiveness of OHS structures;
- effectiveness of OHS representatives; and
- return to work rate.

While in the output part of the model OHS positive performance indicators could cover the two categories as detailed in the best practices model at Figure 1 (AMC & MAC(NZ), 1994: 6).

1. Operational Outcomes - directly connected to best practices:
  - cost;
  - quality;
  - flexibility;
  - timeliness; and
  - innovation;
2. Business Performance Outcomes - indirectly connected to best practices:
  - sales growth;
  - export sales;
  - cash flow; and
  - employment growth.

The opportunity should be taken to develop and implement PPIs on both the input and output sides of the enterprise model. The review of OHS, in the context of the emerging best practice model outlined below will provide an illustration of these possibilities.

**Figure 1**  
**Manufacturing Best Practices Model**



### **The Pervasiveness of Cost Based, Negative and Short Term Performance Indicators**

It is important to appreciate that going beyond negative performance indicators is not just an OHS issue. All key management functions (accounting, finance, engineering, industrial relations/human resource management) have generally been associated with negative, cost based and short-term performance indicators. Industrial relations and human resource management provide classic examples, with an overwhelming emphasis on indicators which focus on strikes, absenteeism, turnover and absenteeism.

Mainstream management texts, courses and ultimately management culture have, until relatively recently, been immersed in negative indicators (BCG, 1994:4). It is not surprising therefore that OHS has been dominated by negative indicators around the world in the last twenty years. Others areas of reform such as environment, work and family and cultural diversity have been treated similarly and therefore equally inadequately.

Underlying these management function emphases has been the fundamental paradigm of competitiveness of the last two hundred years based on cost competition, and the paradigm of organisational effectiveness with structures based on maximum division of labour, hierarchy and centralisation.

### **3. THE OLD PARADIGM OF COMPETITIVENESS**

The old paradigm of competitiveness was based on Adam Smith's (Smith, 1976), and David Ricardo's (Ricardo, 1971), two hundred year old theory of 'comparative advantage'. Smith and Ricardo focused primarily on a narrow conception of factor conditions in specific natural advantages such as minerals, climate and soil as the basis of the factors which determine competitiveness. Competitiveness was therefore based primarily on competing on the cost of a narrow group of factors of production.

### **4. THE OLD PARADIGM OF ORGANISATIONAL EFFECTIVENESS**

The old paradigm of organisational effectiveness was

based primarily on Frederick Taylor's theory of scientific management (Taylor, 1947), using an extreme division of labour combined with multi-layered and rigid hierarchies and intense centralisation of authority. The basic building block for organisation structures and processes was the individual and individuals were viewed in a very negative way - in essence, lazy and irresponsible.

## **5. THE NEW PARADIGM OF COMPETITIVENESS**

### **The Competitive Diamond**

The new paradigm of sustained international competitiveness which has emerged in recent years. (Porter, 1990:69), focuses on quality and innovation and the need for pressure on enterprises to improve productivity, as the key determinants of sustained competitiveness.

In "The Competitive Advantage of Nations" Michael Porter and his colleagues investigated ten nations, over one hundred industries, and many thousands of firms to explore and identify just what produces competitiveness in global markets. The research findings of Porter's study concludes that for modern mixed economies, the scope of factors which determine competitiveness is much broader than simply cost advantage in basic factors of production. The research identifies four broad fundamental determinants of national competitive advantage in an industry and how they work together as a system (Porter, 1990:69). The determinants as detailed in the competitive diamond are:

1. Factor conditions  
The nation's position in factors of production, such as skilled labour or infrastructure, necessary to compete in a given industry.
2. Demand conditions  
The nature of home demand for the industry's product or service.
3. Related and supporting industries  
The presence or absence in the nation of

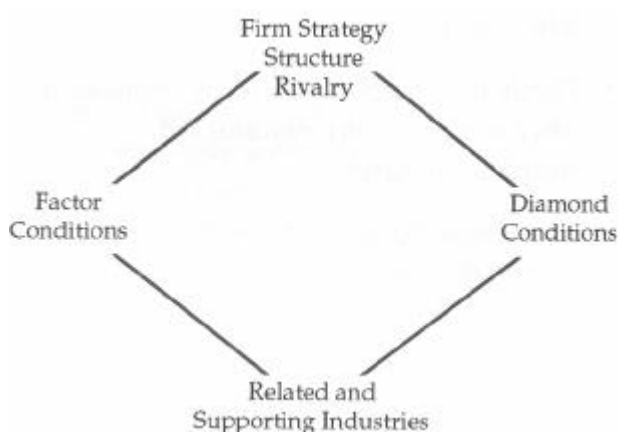
supplier industries and related industries that are internationally competitive.

4. Firm strategy, structure and rivalry

The conditions in the nation governing how companies are created, organised, and managed, and the nature of domestic rivalry.

**Figure 2**  
**Competitive Advantage Diamond**

(Porter)



Porter argued that it was the dynamic interaction of all of these factors that provided the basis for a sustained competitive advantage by enterprises within the industries and nations studied.

The framework and argument presented here is based on an Australian adaptation of the new paradigm viz. that cost based competition may be necessary, but it is not sufficient for sustained competitive advantage.

The direction of change outlined above in all of the determinants of competitiveness provides support for a more positive approach to OHS. These include a more skilled workforce and an improved workplace environment; a more sophisticated home demand for products and services, including higher standards of safety; high quality and internationally competitive supplier industries, based on long term relationships and guarantees of supply; and firms competing on quality and innovation.

**Primarily Competing on Quality and Innovation**

A major finding of the study was the fundamental importance of an enterprise decision whether to

compete primarily on either cost or quality. Porter's research found that, "any successful strategy must pay close attention to both quality and cost while maintaining a clear commitment to superiority on one...the worst strategic error is to be stuck in the middle, or to try simultaneously to pursue all the strategies. This is a recipe for mediocrity and below average performance, because pursuing all the strategies simultaneously means that a firm is not able to achieve any of them because of their inherent contradictions." (Porter, 1990:40)

It is of concern that too many industries and enterprises in Australia appear to be either 'stuck in the middle', with no clear vision or strategy to enable them to make the choice for quality, or 'stuck in the past', with their only focus being on lowering costs. The more productive strategy is to regard cost competition as a necessary but not sufficient basis of sustained competitiveness.

The decision by an enterprise to compete primarily on quality and innovation ensures that positive performance indicators will be required and developed by that enterprise. Competing on quality means continuously adding value to the product or service and that in turn requires adding value to the workforce in terms of their security, capability and commitment (Pfeffer, 1994:27). It therefore increases the likelihood that PPI's will be deployed in relation to OHS.

**Regulation**

Porter's findings in relation to the role of government and regulation are equally if not more challenging (Porter, 1990:647). The research on factors positively associated with sustained international competitiveness is unequivocal. The key conclusions of the study are:

- Stringent standards for product performance, product safety and environmental impact contribute to creating and upgrading competitive advantage. They pressure firms to improve quality, upgrade technology, and provide features in areas of important customer and social concern.

- Particularly beneficial are stringent regulations that anticipate standards which will spread internationally. These give a nation's firms a head start in developing products and services that will be valued elsewhere.
- Tough standards encourage the start-up of specialised manufacturing and service firms to help address them, which can then develop strong international positions.
- National advantage is enhanced by stringent standards that are rapidly, efficiently, and consistently applied. Tough standards combined with an effective process of enforcement represent the best combination for national advantage.
- However, regulations can undermine competitive advantage if a nation's regulations lag behind those of other nations or are anachronistic. Such regulations will retard innovation or channel the innovation of domestic firms in the wrong directions.

These findings of the major research study on international competitiveness raise fundamental questions for many areas of government, private sector and trade union policy in Australia.

In relation to OHS these findings raise fundamental issues concerning the objectives of policy, the role of legislation and standards, the role of trade unions and the role of tripartism. It is not possible to fully address these issues in this paper. However, Porter's evidence on competitiveness and the role of regulation suggests that whatever the benefits of positive performance indicators they should not be regarded as somehow a replacement for effective regulation. The logic of Porter's argument for OHS is that international competitiveness is enhanced by implementing and effectively applying standards that are the best in the world - in other words, applying what might be called 'positive performance regulations'.

## **6. THE NEW PARADIGM OF ORGANISATIONAL EFFECTIVENESS**

The new paradigm of organisational effectiveness is based on four fundamental changes (Pfeffer, 1994: 223):

- Firstly, more positive assumptions are being made about individual workers and ultimately human nature.
- Secondly, the emerging new basic building block for organisational structures and processes is the team or the group.
- Thirdly, the concept of the learning organisation which is open to both continuous and breakthrough change.
- Finally, these changes tend to establish the framework for reducing the number of levels in management hierarchies and for decentralising authority and responsibility.

The idea of worker empowerment has emerged as central to the effective implementation of these changes. The anticipated productivity benefits are regarded as primarily a consequence of a more capable and committed workforce. These changes would all appear to provide an improved context for OHS reforms, including the development of positive performance indicators.

### **The Balanced Scorecard**

A common theme of the new thinking on competitiveness and organisational effectiveness is simply a broadening of the factors that need to be considered and managed to produce competitiveness. Achieving sustained competitiveness is now understood to be more complex than competing on cost and simply focusing on a limited range of financial indicators.

In this context, the concept of the balanced scorecard has been proposed as an essential tool for organisations that better reflects the new thinking on competitiveness and organisational effectiveness. The concept of the balanced scorecard was initially developed by Professor Robert Kaplan and David

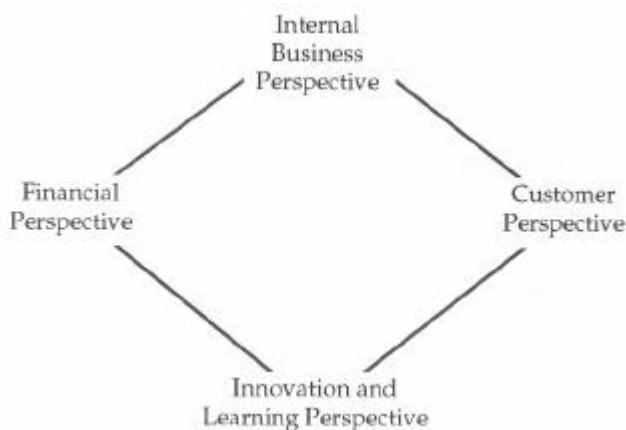


Norton of the Harvard Business School as an enhanced measurement system for corporate performance that can motivate breakthrough performance (Kaplan & Norton, 1992).

The balanced scorecard translates a business units mission and strategy into a set of measures built around four perspectives:

- Financial: How do we look to our shareholders?
- Customers: How do we become our customers most valued supplier?
- Internal Processes: What processes - both long and short term - must we excel at, to achieve our financial and customer objectives?
- Innovation and Improvement: How can we continue to improve and create value, particularly in regard to employee capabilities and motivation?

**Figure 3**  
**Balanced Scorecard Diamond**  
(Kaplan & Norton)



The strategic importance of the balanced scorecard is that it provides, as a mainstream management tool, a set of indicators that stress the need to include a wide range of positive performance indicators. Thus the door is opened for OHS based positive performance indicators to be brought into the mainstream of management.

The balanced scorecard concept has been adapted in Australia with the addition of a fifth measure - the employee perspective, (Marden, 1994). This has

further enhanced the potential of the balanced scorecard to incorporate OHS positive performance indicators.

The benefits of the balanced scorecard are considered to include the following (Kaplan & Norton, 1992):

- Making strategy operational by translating strategy into performance measures and targets.
- Helping to focus the entire organisation on what must be done to create breakthrough performance.
- Acting as an integrating device, an umbrella, for a variety of often disconnected corporate programs, such as quality, re-engineering, process redesign, and customer service.
- Helping to break down corporate level measures so that local managers, operators, and employees can see what they must do well in order to improve organisational effectiveness.
- Providing a comprehensive view that overturns the traditional idea of the organisation as a collection of isolated, independent functions and departments.

In short, the balanced scorecard is an enterprise focused tool that is consistent with the requirements of both the new thinking on sustained competitiveness and organisation effectiveness.

## **7. THE NEW PARADIGMS IN AUSTRALIA - OPPORTUNITIES, CHALLENGES AND CONTRADICTIONS**

The emergence of the new paradigms for sustained competitiveness and organisational effectiveness, combined with the opening up of the Australian economy to international competition since 1983, provides many opportunities, challenges and contradictions. The major national opportunity is to restructure the economy to primarily compete on quality and innovation, in both products and services. This will provide the basis for economic and employment development, (P.J. Keating, 1994).

The opportunity for OHS is to improve its effectiveness through both continuous improvements and real breakthroughs in areas of priority. Specific opportunities exist to reposition and revitalise OHS in the context of the new thinking on competitiveness and effective organisational performance. This will certainly include going beyond negative performance indicators and developing positive performance indicators.

### **The New Paradigms in Australia**

The new paradigms of competitiveness and organisation effectiveness are developing with distinctive features in Australia including:

- Caution, in relation to the applicability of the competitive diamond, given the extent to which Australia remains a commodity trader.\
- Exploration of the use of enterprise networks as a substitute for the relative lack of naturally occurring clusters of competing and innovating enterprises and suppliers.
- Increased perception of cost competition as a necessary but not sufficient basis for sustained international competitiveness.
- Continuing ascendancy of deregulation with a limited emergence of a more sophisticated approach to the regulation/ deregulation debate.
- Co-operative emergence of the best practice management concept and practice as a catalyst for the new paradigm of organisational effectiveness.
- Changing role for unions with a stronger focus on enterprise bargaining.

In certain respects, the Australian iteration of the new paradigms may limit the opportunity to develop positive performance indicators. The slow and uneven transition to compete on quality and innovation is of particular concern. The extent of the reliance on deregulation flies in the face of the evidence on international competitiveness. However, in the short term at least, this may actually support

the emergence of positive performance indicators which some may regard as an alternative to regulation.

Other trends in Australia will provide support for the development of PPIs. The innovative use of enterprise and supplier networks will assist a quality and innovation approach to competitiveness. The success of the Best Practice program and a strengthening of the role of unions within enterprises will all potentially provide support for the development of PPIs.

In sum, the fundamental nature of the paradigm shifts will ensure that some new opportunities for developing PPIs will be available in Australia.

### **Some New Opportunities**

The opportunity to revitalise and reposition OHS by using new networking and campaigning to make breakthroughs in relation to positive OHS performance indicators will require influencing a number of other areas. They include the individuals and organisations associated with:

- The Australian Best Practice Demonstration Program
- Australian and International Quality Awards
- Industry Commission indicators
- International Competitiveness indicators.

The opportunities, as well as the challenges and contradictions faced by OHS, are perhaps best illustrated by a consideration of the Federal Government's Best Practice Demonstration Program and its relationship to OHS.

### **The Australian Best Practice Demonstration Program**

The Australian Best Practice Demonstration Program (ABPDP) was introduced in 1991 by the Federal Government as part of the Economic Statement, Building a Competitive Australia. (Hawke, 1991). The program aims are to accelerate the spread of best practice reforms and to develop an improved workplace culture throughout Australian industry.

To date, 43 enterprises in a wide range of industries have been supported by the program to implement major and innovative reforms in their operations. All companies receiving project assistance are committed to demonstrate to their peers, to wider industry and to the community generally, the benefits of reform and ways of achieving international best practice. The successful companies in the third round of the program (which has a focus on small and medium enterprises, particularly those with an export focus and/or involved in networks) will be announced by the Minister of Industrial Relations in late 1994 (ABPP, 1994a).

The ABPDP program is widely regarded as one of the most successful government initiatives and partnerships between the government, unions and private sector. The Program has attracted international interest, particularly from the Clinton Administration in the USA which has announced its intention to legislate for a similar program in the US, (Clinton, 1994). The best practice agenda will clearly continue to play a key role in Australia's efforts to achieve international competitiveness.

The handling of OHS within the best practice program is therefore an important issue. At best it can provide strategic leverage to position OHS as a fundamental part of best practice. It can also provide a framework for developing a role for OHS positive performance indicators. Alternatively it can leave OHS as a second order agenda area still limited by a range of negative performance indicators.

### **Characteristics of Best Practice**

The experience of the best practice program to date has identified 13 principles or characteristics of best practice, (ABPP, 1994b).

Occupational health and safety is currently covered in characteristic number seven which reads, 'Innovative human-resource policies which include a commitment to Occupational Health and Safety and Equal Employment Opportunity'. It is of course important that OHS has been identified as an aspect of best practice. However, to date, it remains simply

one of a number of items included under human resource management. This is despite the fact that in a number of the 43 best practice companies OHS initiatives have been identified as key in themselves and as catalysts for other best practice initiatives.

### **Model of Best Practices**

The development of a model of best manufacturing practices is now underway in a cooperative venture between the Australian Manufacturing Council and the Manufacturing Advisory Group (N.Z.), (AMC & MAC(NZ), 1994). This initiative is of critical importance as it provides a framework to help explain the relationship between best practices and different operational and business outcomes. Without a credible model the best practices characteristics or principles are simply a checklist with limited explanatory or operational utility.

The best practices model under development focuses on the dynamic interaction between strategy, practices and outcomes and is currently being empirically tested in Australia and New Zealand. Best practices have been grouped under six areas of: leadership, people, customer focus, quality of process and product, benchmarking and technology, (AMC & MAC(NZ), 1994). OHS is located under 'people' as one element of the best practice characteristic 'innovative human resource management'. Three other best practice characteristics are included under the 'people' area of best practice. In short, OHS is not as well positioned in the best practice model as it arguably merits.

Enterprises identified as 'leaders' in the study are producing the following operational and business outcomes:

- Superior overall business performance in such areas as growth in total and export sales.
- Greater employment growth.
- Better comparative performance in such areas as sales from new products, total cost per unit and key cycle times.

- A better work environment offering more training to employees, experiencing fewer industrial disputes and workplace accidents, and having more effective enterprise agreements.

Thus the only reference to OHS in the output side of the model is to the fact that best practice "leaders" reported lower lost time due to workplace accidents than competitors!

### **Influencing the Best Practice Agenda**

The best practice model and characteristics are currently in draft form. There is therefore still an opportunity to change the current positioning of OHS in the best practice agenda. Areas of possible change include:

- Establishing OHS as one of the principles or characteristics of best practice.
- On the input side of the best practices model, identifying a group of core OHS reforms and initiatives that can be measured by positive performance indicators.
- On the output side of the model, undertaking research to establish positive and direct relationships between OHS input reforms and initiatives and the six areas listed in the operational outcomes index of the best practices model (cost, quality, flexibility, timeliness, innovation, competitiveness).
- On the output side of the model, undertaking research to establish positive, albeit indirect, relationships between OHS input reforms and initiatives and the areas (yet to be confirmed) listed in the business performance index (sales growth, export sales, cash flow, employment growth).

It is clearly more difficult to establish linkages between OHS inputs and the business performance part of the best practices model. However the structure of the best practice model with its two categories of outcomes: the direct (the operational outcomes index) and the indirect (the business performance index), may nevertheless be most useful

in the task of establishing evidence for a positive relationship between OHS input reforms and initiatives and operational outcomes.

Achieving a breakthrough on this issue will require a decision to give this issue priority, some new networking, refocussing of existing networks and research by the OHS community, particularly by Worksafe Australia. An initial basis for networking already exists given the overlap between various tripartite representatives of employers, unions and government in the OHS and best practice areas.

In addition the following activities would be useful:

- Formal and informal discussion between key OHS and Best Practice individuals at all levels.
- Networking through conference and workshop attendance.
- Exchange of staff working on OHS and best practice.
- OHS Agency and Union cooperation to develop positive performance indicators.
- Research on OHS and best practice characteristics, models and performance indicators.

Finally, the OHS Best Practice Case Studies provide a base to build on, (Worksafe, 1993a). However, to date, these cases have mainly relied upon negative performance indicators; the cases need to be developed as a model of OHS best practice that can be empirically tested to provide some evidence of causality between OHS best practice and positive performance outcomes.

### **Australian and International Quality Awards**

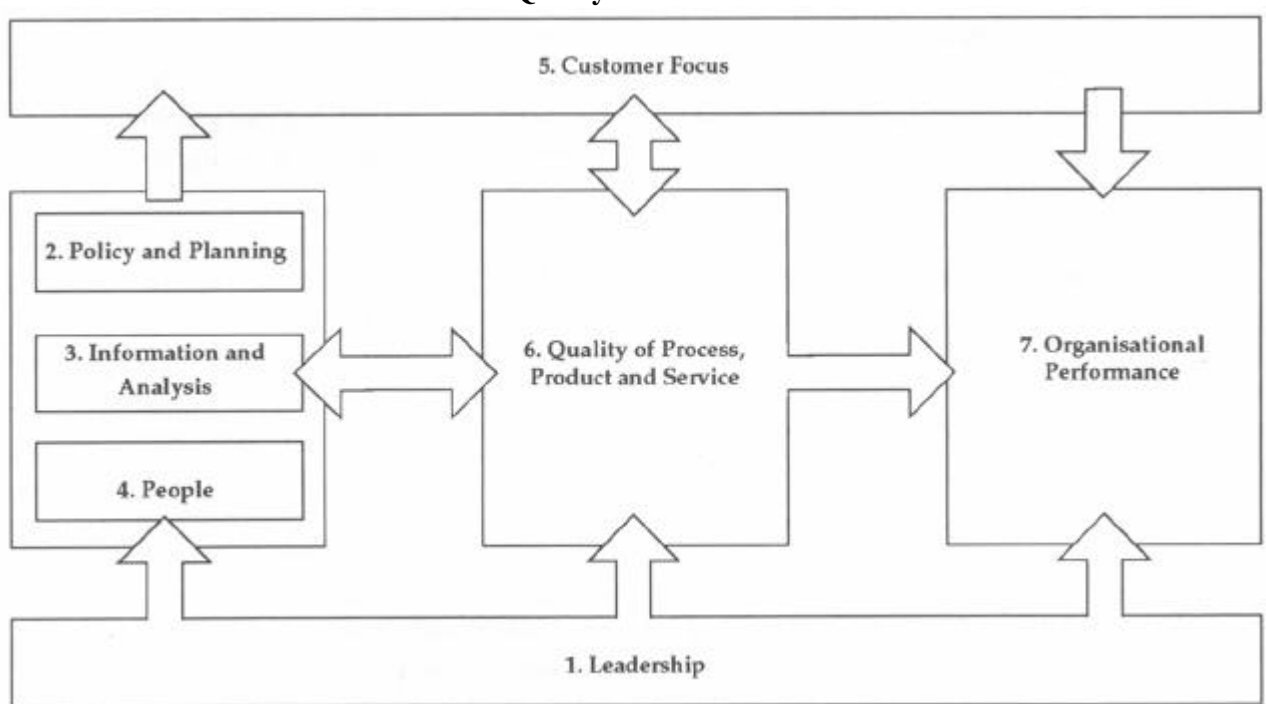
A somewhat similar opportunity to influence the agenda in a way that will provide leverage for change at an industry and enterprise level exists in relation to the quality awards.

The Australian Quality Awards (AQC, 1994), are based on an evolving set of criteria and a quality model based on seven categories of leadership,

policy and planning, information and analysis, people, customer focus, quality of process, product and service and organisational outcomes. The quality awards provide a prestigious national focus for enterprises in all industry sectors. The award criteria cover OHS in a limited way under the category of 'people'. There is no recognition within the quality award criteria of occupational health and safety PPIs.

The task required to achieve change is similar to the above, the quality networks are different although again there are areas of overlap with OHS networks. In addition, there are currently efforts underway to better integrate the best practices agenda with the quality awards. A more positive role for OHS in one agenda area will therefore assist developments in the other area.

**Figure 4**  
**Australian Quality Award Criteria Model**



The Australian Quality Award criteria are significantly influenced by the award criteria contained in the Japanese, US and European quality awards (1994; EFQM, 1994). These key international awards provide a limited role for OHS based on negative performance indicators. Steps should be taken to encourage national OHS agencies in these other countries to influence the future development of their quality awards towards a more positive role for OHS.

#### **Industry Commission Indicators**

The Industry Commission has developed a framework for performance indicators that it uses in its various studies, (Maddox, 1994). Its framework comprises descriptive indicators, efficiency

indicators and effectiveness indicators. There is a strong focus on key financial indicators.

It appears that the Industry Commission framework does not incorporate the elements outlined above in the balanced scorecard. In particular the Industry Commission framework does not appear to adequately cover issues relating to innovation and quality—the essence of the new paradigm of competitiveness. These are concerns of general significance. They have specific significance given the current Industry Commission study of OHS in Australia. The Industry Commission study has the potential to contribute to the development of positive performance indicators for OHS. However that

potential may not be realised in the context of the existing Industry Commission's performance indicators. It is therefore important that the Industry Commission performance indicators be changed to more fully reflect contemporary thinking on competitiveness, regulations and organisational effectiveness.

### **The World Competitiveness Report Indicators**

The annual publication of the World Competitiveness Report indicators is an event eagerly awaited around the world (IMD/WEF, 1992). Government and private sector policy is increasingly being influenced by the ranking's contained in the comparative tables of the Report. A careful scrutiny of the report reveals that it contains some OHS indicators - lost time indicators. It may all seem very far away from a workplace in Adelaide's Western Suburbs but changes here could ultimately help improve workplaces in Adelaide and around the world. Again appropriate networking and research should be used to achieve change in the treatment of OHS in the international competitiveness indicators.

### **Challenges and Contradictions**

The opportunities for developing OHS positive performance indicators have never been better as the result of the fundamental changes of thinking on competitiveness and organisation effectiveness. However it is useful in conclusion to briefly consider some challenges and contradictions that are also associated with these paradigm changes

### **The Reality of the New Competition**

The new paradigm of competitiveness as outlined above stresses the need to compete on quality and innovation. The pressure for improved productivity and competitiveness can come from many sources including regulations that are rigorously enforced. It is in regard to the future role of regulation and standards that the clearest contradictions are evident.

This is illustrated by considering what appears to be a contradiction between the achievement of best

practice and the use of tripartism. Tripartite structures typically comprise representatives of employers, union and trade unions. Policy and practice on OHS is often developed within tripartite structures and processes. Indeed many key achievements in policy and practice have been attributed to the work undertaken through these structures (Worksafe, 1994). However, the policy output from tripartite structures can generally be characterised as consensus based and is arguably often close to a lowest common denominator position. In contrast, best practice implies just that - the very best practice. The issue now is to ensure that tripartism continues to work effectively given the new evidence on the positive role of best practice regulation in achieving sustained competitiveness.

### **The Reality of the New Management Paradigm**

The new management paradigm stresses the need to empower workers. This is increasingly being reflected in organisational mission statements and corporate objectives. The key focus for worker empowerment is the team or group with more decision making discretion given to the team. This is generally accompanied by an elimination of layers of management position and a decentralisation of responsibility and accountability. There is little doubt that teams and individual workers can have increased autonomy under these new arrangements. It is less clear what the net and long term impact of these changes will be. Issues of concern include:

- The impact of the new mission statements with their strong focus on the need for unity of purpose, values and attitudes.
- The limited autonomy often available to the new teams.
- The limitation of empowerment within the teams as a result of peer group pressure.
- The potential to undermine the role of independent unionism, the collectivism of the union being replaced by the collectivism of the team.

These trends may in the end produce an even more unitary workplace environment than existed in the past with less scope for diversity and pluralism in decision making structures and processes. This in turn could reproduce the low trust and low motivation workplace outcomes that have undermined productivity in the past (Fox, 1974).

Careful analysis of these contradictions as they unfold is of importance to policy and practice in OHS. Current assumptions about the directions of change and the most effective policy responses may or may not prove to be valid.

### **The Role of Worksafe Australia**

It is evident that there are many opportunities for Worksafe as a result of the emergence of the new paradigms in Australia. To maximise the potential of these opportunities it may be useful for Worksafe to review its own performance indicators, organisations structures and priorities. The development of positive performance indicators, particularly for both the input and output side of an organisations activities would appear to connect to six of the seven major Worksafe Programs. (Worksafe, 1994) However the new networking and campaigning suggested by this paper will require deployment of sufficient resources over time if any real breakthroughs on positive performance indicators are to be made.

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