PERFORMANCE MEASUREMENT, INCENTIVES AND ORGANISATIONAL CULTURE:

IMPLICATIONS FOR LEADING SAFE AND HEALTHY WORK

October 2015

AUTHORS

Dr Sharron O'Neill
International Governance and Performance (IGAP) Research Centre
Macquarie University

Ms Karen Wolfe (CPMSIA)
Australian Nuclear Science and Technology Organisation (ANSTO) and
Safety Institute of Australia

Dr Sasha Holley
International Governance and Performance (IGAP) Research Centre
Macquarie University

RESEARCH SPONSORED BY

This project was collaboratively funded by Safe Work Australia, CPA Australia, the Safety Institute of Australia and the Macquarie University *Enterprise Partnership Grant* scheme.

Macquarie Lighthouse Press
Macquarie University NSW 2109

ISBN 978-1-76028-428-2 [PDF]
ISBN 978-1-76028-429-9 [DOCX]

Forward

Safe Work Australia is working closely with the International Governance and Performance (IGAP) Research Centre at Macquarie University, to standardise and improve work health and safety reporting by businesses and organisations. This work is being co-funded by the Safety Institute of Australia and CPA Australia.

Currently there is a lack of standardised and accepted indicators to measure the work health and safety performance of organisations and businesses at the organisational level. Work health and safety information can and is being reported on a voluntary basis, however reporting is often selective and inconsistent. This hinders comparisons of work health and safety performance and due diligence reporting over time and across organisations.

This paper is the fourth and final in a series of research papers on the Role of Accounting in Work Health and Safety Governance. The work is informing a broader three staged policy development project taking place over three years. The aim of the project is to develop a standardised set of indicators businesses can use in annual reports as well as guidelines for the development of lead and lag indicators relevant to the size and nature of the business.

Stage one involves developing a draft set of external and internal indicators to improve organisational level work health and safety reporting and to help Officers meet their due diligence obligations under the model Work Health and Safety Act.

Stage two involves testing of the work health and safety indicators and guidelines. Testing will be carried out using a mixed method approach involving case studies, interviews and surveys in selected businesses across Australia. A pilot test will be conducted and an assessment of the outcomes undertaken.

Stage three will involve a review of the research outcomes, which will be used to develop policy options for the consistent use of standardised work health and safety indicators and guidelines.

Safe Work Australia

September 2015

Contents

Executive summary

Safety **culture** refers to underlying values, assumptions and beliefs that are collectively embraced and embedded in a group, and expressed in the shared and often unconscious behaviours, patterns and structures that affect work health and safety (WHS). Culture is therefore a characteristic of groups. It is often described as '**the way we do things around here'**. However, unique subcultures, or pockets of difference, may exist in different work groups, across departments or between levels of management.

Attributes of culture(s) are not readily measured nor easily changed. However, the culture of a group will be informed by its members' individual perceptions of their work environment their various experiences, beliefs and actions. Collectively these perceptions are reflected as the organisation's **climate,** which is based on their personal experiences of:

- the policies, procedures, practices and routines to which they are subject, and
- the kinds of behaviours and events they see occurring and being rewarded or supported.

It is suggested that if 'culture' were to be characterised as an organisation's enduring '**personality'**, then 'climate' would reflect its '**mood'** at a given point in time.

While leaders cannot create or change culture directly, they can influence (safety) culture indirectly by shaping individual perceptions (i.e. safety climate). Schein (1992) observes that leaders influence by,

> *… what they systematically pay attention to. This can mean anything from what they notice and comment on to what they measure, control, reward and in other ways systematically deal with.*[1]

In each organisation, its leaders are responsible for the design and implementation of policies and strategies, the setting of performance targets and allocation of resources. As such, **leaders control the practical mechanisms** for shaping the organisation's safety climate. This means leaders have the capacity to impact the perceptions that inform and may generate change. More importantly, whether they realise it or not, it means leaders continually influence the safety climate through the impact of their managerial decisions on both WHS and on the work environment more generally.

To address WHS risk effectively, leaders must understand how (all) managerial decisions are likely to impact WHS and then apply that knowledge when considering any and all business decisions. This holistic, organisation-wide approach to managerial decision-making is reinforced in the officers' due diligence obligations in Australian WHS legislation. It demonstrates that safety leadership is not simply about **leading SAFETY**, it is about **leading** (the business) **SAFELY**.

Executive and employee performance management systems play a vital role in shaping the safety climate that underpins cultural change in WHS. This includes management and accounting controls relating to WHS performance AND broader business performance objectives. The way **management control systems** are **designed, aligned** and **implemented** contributes significantly to employees' lived experience of WHS. This is because competing controls and incentives can operate to radically undermine, rather than strengthen, the organisation's best WHS efforts. The problem is perhaps most evident where a WHS management system targets the policies and practices governing frontline employees while, at the same time, the broader corporate and organisational practices, policies and incentives that subject the employees to hazardous work conditions or pressures remain unchanged.

Tailored, robustly-designed and validated surveys can highlight these problems by giving leaders insight into individuals' perceptions of their work environment and its impact on WHS. Comparisons in survey results over time provide feedback to managers on the perceived effectiveness of managerial interventions and highlight where strategies and policies may need rethinking. However, while climate results are useful, they contribute to, rather than present a substitute for, a suite of lead and lag indicators of WHS performance that are essential to informing leaders about the identification and control of critical risk factors and the organisation's success in preventing injury and illness at work.

[1] Hopkins 2002.

This is the last in a series of four reports to explore issues that are shared, overlapping and at times competing for the two disciplines of work health and safety (WHS) and accounting. The report highlights issues relating to the integration of WHS in a broader organisational culture and the implications of performance measurement and management on efforts to foster a culture of safe and healthy work.

1. Culture and climate

There have been numerous comprehensive reviews of literature on culture and climate, both in the broader organisational context and as relates specifically to work health and safety (WHS).[2] Research studies conducted in the 1960s-80s reveal 'culture' and 'climate' each to have reasonably differentiated and defined meanings[3], although recent reviews in a safety context tend to suggest the constructs have become confused and contested.

The origin of this confusion appears to date from the 1980-90s as constructs of culture and climate became used by a growing range of disciplines, including anthropology, sociology, linguistics, education and safety,[4] to examine particular aspects of organisational context. Some researchers departed from Denison's under-pinning tenets of the constructs (see Table 1), most notably by using the term 'culture' when discussing studies of 'climate', or incorrectly using the terms interchangeably.[5.]

Further complicating matters, the terms 'safety culture' and 'safety climate' were conceived to signal attention to those aspects of climate and culture that relate specifically to WHS, that is, impacting on WHS.[6] This led to debates as to whether these were subsets of organisational culture and climate, or distinct and separate constructs altogether, and whether a 'safety culture' is either present or absent or, alternatively, is common to all organisations, existing on a continuum from poor to great.[7]

Amid concerns that these definitional debates have the "capacity to create heat [debate] without light [new knowledge]",[8] the body of literature on safety culture has grown unnecessarily blurred and confused.

Mindful of that context, this report deliberately adopts an integrated perspective on culture and climate, consistent with Hale (2000), Bluff (2011), Borys (2014) and others[9], positioning 'safety' culture within a broader organisational culture/subculture (and similarly positioning safety climate within organisational climate).

For example, safety culture then refers to those *shared* beliefs, assumptions, values and actions *that impact on WHS.*[10] It may range from a culture that fails to value WHS, to one that actively values and prioritises WHS. An organisation that "focuses on",[11] or prioritises, those beliefs, assumptions, values and actions required to ensure safe and healthy work is therefore conceived as having a 'culture of safety'.[12]

Anchoring the discussion in this way allows past research on organisational culture and climate to help clarify the notions of culture and climate employed in studies of WHS and 'safety culture'. More importantly, it avoids the temptation to view safety culture as a silo, as a construct divorced from its organisational and broader social context.

1.1 Reflections on culture

Organisational culture is a construct that refers to those underlying values, assumptions and beliefs that are *collectively* embraced and embedded in an organisation or group and expressed in *shared* behaviours, patterns and artefacts (where artefacts are seen as visible actions).[13]

Put simply culture is reflected as "***the way we do things around here***" (Schein 1992).[14]

[2] Denison 1996; and for a review, Bluff 2011.
[3] Various studies in the 1960s-1980s, particularly in the organisational psychology and sociology literature.
[4] Peterson and Spencer 1990.
[5] Hopkins 2002.
[6] Bluff 2011.
[7] Hopkins A 2002, 2000; Guldenmuld 2000.
[8] Pidgeon 1998.
[9] Pidgeon 1998; Guldenmuld 2000; Schneider 1996.
[10] Bluff 2011.
[11] Borys 2014.
[12] Hopkins 2005.
[13] Guldenmund 2000; Schein 1992.
[14] Hopkins 2002.

From an organisational perspective, a number of characteristics of culture are worth noting:

- **Culture is a characteristic of *groups*, not of individuals**. It is a multi-level, complex concept involving shared patterns of beliefs, understandings, interactions and behaviours that are not only learned, but shared and reinforced through exposure to others.
- **Organisational culture may encompass different *subcultures***.

  Assumptions and beliefs may (or may not) be shared across work groups, or between types of workers (such as employees, supervisors, managers, officers, etc). The "strength" of a culture relates to the extent to which the values that govern behaviour are shared across sub-groups. Where many "pockets of difference" exist, a culture is described as "weak". [15]
- **Analysis of culture** (**cultural meaning) is not suited to quantitative methods**, **such as surveys**. Because culture captures a "more subtle" and potentially unconscious "psychology of the workplace"[16], examining it requires a qualitative approach that is better able to correctly distinguish the espoused (what is said or reported) from the enacted (what actually happens or is valued). [17] Studies of culture typically involve multiple data sources, including field interviews, observation and organisational stories.
- **Cultural change occurs slowly** and so is said to be **more enduring** than climate.[18] It is grounded in shared, deeply rooted and relatively stable assumptions about human nature, activities and social relationships.
- **Importantly, culture cannot be directly manipulated**. Embedded values or beliefs of an individual cannot be 'changed' by others. Individuals may change their beliefs in response to changes in their experience. Within this context, the focus for cultural change is on changing the group members' experience of work (organisational climate).[19]

It has been suggested that if culture were to be characterised as the enduring '**personality'** of an organisation, then climate would reflect its '**mood'** at a given point in time[20].

[15] Goh, Brown, Spickett 2010.
[16] Schneider, Brief and Guzzo 1996, p11.
[17] Dekker 2006, Borys 2009.
[18] Schneider et al. 1996.
[19] Schneider et. al.1996, 2013; Goh et. al. 2010.
[20] Cox and Flin 1998; Borys 2014.

1.2 Reflections on climate

The **climate** of an organisation is a reflection of its members' *perceptions of their experience(s)*.

> Each individual's perceptions are based on their personal **experiences** of the **organisational policies, procedures, practices and routines they are subject to** and the kinds **of behaviours and events they observe occurring and being rewarded or supported.**[21]

Survey-based analyses of organisational climate have a long history in the social sciences[22]. Climate surveys provide an aggregated snapshot of the *meaning* that *individuals* ascribe to an organisation's "objective properties" (i.e. visible structures, practices, artefacts, and events)[23] at a particular point in time.

Comparisons in survey results over time provide feedback to management on the way in which respondents perceive organisational-change efforts to have influenced the work environment. Climate surveys cannot, however, tap reliably into the more deeply held and potentially unconscious beliefs and values that constitute 'culture'.

Table 1 summarises key distinctions between culture and climate as outlined in the literature.

Organisational research perspectives		
Literature	**Culture**	**Climate**
Epistemology	Contextualised	Comparative
Level of analysis	Underlying values and assumptions	Surface level perceptions
Methodology	Qualitative field observation	Quantitative survey data
Theoretical foundation	Social construction	Lewinian field theory[24]
Discipline	Sociology and anthropology	Psychology
Point of view	Emic ('native' point of view)	Etic (researchers'[25] viewpoint)
Temporal (time) orientation	Historical	Ahistorical snapshot

Table 1. (Source: Adapted from Denison 1996)

[21] See Schneider et. al. 1996, Schneider et.al 2013.
[22] See for example Lewin 1939, and other organisational climate research through the 1960s-70s.
[23] Rentch 1990.
[24] See the work of Kurt Lewin 1939.
[25] The researcher develops the survey and thereby structures or constrains the information obtained.

1.3 Safety culture and climate

Safety culture refers to shared and deeply-held beliefs and behaviours people have regarding work health and safety in their organisation.[26] It is one aspect of an organisation's culture. Others may include, for example, technology, business strategy and work schedules.[27]

As noted in Safe Work Australia's cogent (MAPS) literature review,[28] safety culture has been examined from different perspectives. These include studies that have: focused on *subcultures*, such as safety culture of workers, supervisors or managers; that examine the *influence of power* across organisations, work sites or groups; and that consider issues relating to the stability and the *strength* of safety culture or subcultures.

Theoretically, a 'strong', or conversely 'weak', culture refers simply to the **pervasiveness** of that culture (e.g. across an organisation). It offers no insight into the qualities or nature of the culture. Models developed to meet this need include Hudson's (2001) Maturity Model[29] which offers descriptors or sign-posts for understanding safety culture.

While some criticise its linearity[30], Hudson's model has been embraced as a pragmatic tool to help leaders recognise where their organisational culture might sit on a continuum from 'pathological' unsafe or anti-safety beliefs and actions, to a 'generative' culture that genuinely prioritises safe and healthy work.[32]

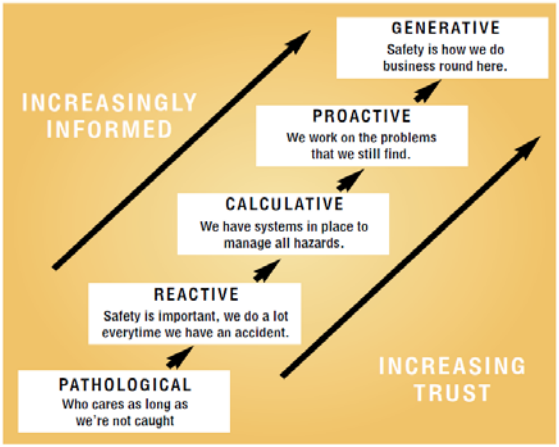


Figure 1: Hudson maturity model[31]

Reason (1997) paved the way by offering a useful model for understanding the essential attributes of a mature, or 'informed', safety culture.[33] He argues that an informed culture possesses four cultural characteristics:

- a reporting culture (transparency)
- a just culture (fairness)
- a flexible culture (empowered)
- a learning culture (continuously improving).

Reason's and Hudson's models shed light on complementary aspects of a culture of safety. Together they can guide efforts to understand the existing culture of an organisation, and the subcultures that may exist within it. This is a critical precursor to considering the need for, and then driving, cultural change.

CULTURAL CHANGE

Culture is not directly malleable or manipulated, but it can be influenced rather predictably in one of two ways: either following a cataclysmic event (such as a radical change in leadership and management values, or after experiencing a catastrophic injury); or, alternatively, "through slow, intensive, long-term efforts".[34]

The change process relies heavily on the theory of **cognitive dissonance**[35]**.** Cognitive dissonance refers to the dissonance (stress or unease) an individual feels when they hold conflicting ideas, beliefs or attitudes, or when they behave in a way that contradicts their underlying values or beliefs.

The theory posits that to avoid this internal stress people will, over time, either come to act differently (i.e. to behave in a way that is more consistent with their beliefs) or their beliefs will adapt to conform to the way they are required to act. Examples, such as reducing rates of smoking or littering and improving WHS, highlight the complementary use of regulation and cognitive dissonance to 'socially engineer' positive change in society.[36]

[26] Cooper 2000 p.114.
[27] Choudry, Fang and Mohamed 2007; Bluff 2011.
[28] Bluff 2011, see also Borys 2014.
[29] Hudson 2001.
[30] Parker, Lawrie and Hudson 2006 p.555.
[31] Hudson 2001 p.30, 2014a,b; Reason 1997.
[32] Parker et. al. 2006; Hopkins 2006 p.885.
[33] Reason 1997, pp.195-196. For a TED Talk on building an informed culture to enhance productivity: http://www.ted.com/talks/yves_morieux_as_work_gets_more_complex_6_rules_to_simplify
[34] Peterson 1990 p6.
[35] A term introduced by psychologist, Leon Festinger.
[36] Hopkins 2002 p.6.

"Cultural change will not occur through new mission statements, speeches, newsletters, or a big party to kick off a new way of doing things, or even through changing the organisation's architecture. To communicate new values and beliefs requires changing tangibles - the thousands of things that define climate, that define daily life in the organisation. Deeds, not words, are tangible…

"Only by altering the everyday policies, practices, procedures and routines [in a meaningful way], thereby impacting the beliefs and values that guide employee actions, can change occur and be sustained…

"Culture can be changed through a focus on climate [because] climate reflects the tangibles that produce a culture; the kinds of things that happen to and around employees and that they are able to describe."[37]

This is where the link between safety culture and climate is critically important. Actions such as changing leaders, workers, work locations, processes, support and relationships with other organisations can each, over time, lead to cultural change through their influence on the organisational safety climate.[38]

1.4 Evaluating safety climate

Safety climate surveys do *not* measure safety *culture*. Safety climate is, however, a leading indicator of safety criteria, with the relationship between safety climate and injury outcomes demonstrated to be robust and stable over countries and industries[39]. This suggests valid, well-constructed safety climate surveys offer a robust leading indicator of safety outcomes[40].

Notably, research into this relationship has also found that past injuries are a stronger predictor of safety climate, than safety climate is a predictor of future injuries[41], reflecting the way personal experience shapes perceptions. Further, the relationship between safety climate and safety outcomes weakens as more time elapses between the climate survey and the injury occurences[42]. This demonstrates the temporal nature of climate survey results. The surveys assess how individuals perceived and described their work environment and its values at a specific point in time.

These *perceptions,* accurate or inaccurate, represent the reality of WHS management from the perspective of survey respondents.[43]

This means that rather than being the starting point for cultural change, climate surveys are a tool to measure perceptions of the need for, or success of, organisational reform; a tool for monitoring the leaders' success in designing and implementing change in WHS.[44] Thus they can provide important feedback on safety leadership and managerial behaviour.

The value of climate surveys not only lies in the time- and context-specific survey results but, importantly, in their ability to identify change over time in respondents' experiences (of WHS) and perceptions of organisational functioning (with respect to WHS).

The safety climate of different groups within an organisation can mediate the relationship between overall organisational safety climate and behaviour because different organisational subgroups may have different experiences and perceptions of their WHS environment[45]. The differing perspectives across subgroups are lost where survey results are aggregated.

Providing both an overall survey response, as well as detailed information on within-group and between-group interrater reliability (agreement among individuals) is therefore important to highlight those areas where management structures, systems or practices may not be working quite as well as others. Research therefore suggests that a detailed comparison of ideal versus actual responses (i.e. expected versus perceived reality) "is often the most informative contrast"[46].

[37] Schneider et. al. 1996, p12. The final paragraph also consistent with Hofstede in Hopkins 2002.
[38] Bluff 2011.
[39] Zohar 2010.
[40] Nahrgang et. al. 2008; Zohar 2010; Borys 2014.
[41] Beus et al 2010.
[42] Beus et al 2010.
[43] Denison 1996, p624; Peterson 1990. NB. others have identified conceptual variations on climate e.g. Moran and Volkwein 1992; Verbeke et. al. 1998.
[44] Borys 2014.
[45] Zohar and Luria 2005.
[46] Peterson 1990, p13.

CONSIDERATIONS FOR SURVEY DESIGN

Because climate surveys tap individual-level perceptions, survey items (questions) must be theoretically driven and robustly validated so that aggregated survey results can provide unambiguous insights into higher-level (organisational/subunit) units of analysis.

Using validated surveys or seeking advice from specialist designers is important since climate surveys must ensure:

1. Items assess organisational functioning in an appropriate way
2. Data is aggregated to an appropriate (higher) level of analysis
3. Measurement is focused on important organisational outcomes.[47]

Examples of high-level (organisational) factors linked to WHS outcomes include management values (e.g. concern for employee well-being), management/organisational practices (e.g. adequacy of training, provision of safety equipment, quality of WHS management systems), employee empowerment and communication[48].

Other climate dimensions also reflect this organisational-level focus, e.g. management commitment and involvement, safety systems, reward systems, reporting systems, pressure and competence.[49]

Prior safety climate research suggests effective WHS management is underpinned by organisational factors such as management commitment, trust and role clarity. A meta-analysis of climate survey studies revealed '*perceived management commitment to safety'* to be the dimension most robustly associated with future injuries.[50]

Given the important role of climate surveys in evaluating the change in safety climate over time, the number of potential items (questions), and the extensive content variability among them, presents an important limitation on the integrity of survey results.

Data reliability is difficult to maintain over time if changes in the survey format or philosophy serve to undermine comparability of the findings. Together this reinforces the importance of robust survey design and validation.

1.5 Evaluating safety culture

In contrast to the personal nature of climate, culture refers to group attributes. These are deeply embedded patterns of shared values, behaviour, beliefs and assumptions. These characteristics are not readily measured. As Antonsen argues,

> *The basic assumptions that in many ways form the core of culture are impossible to grasp through survey results.*[51]

Qualitative approaches, such as ethnographic assessments, are more effective – although their limitations, too, need be acknowledged. Observations, for example, rely on the capture of *visible* indicators of *invisible* norms and assumptions.

Efforts to observe and then interpret shared behaviours can result in things other than culture being measured. Even trained researchers bring their own sub-conscious biases, perceptions and framing to the data interpretation process.

Further limitations to evaluating culture include the significant resources (both time and cost) required to conduct robust assessments, and the nature of the relationship with the researcher (e.g. grounded in power and control or mutual trust and respect), each of which can influence not only the evaluation of safety culture but the safety culture itself.[52]

These limitations have led to supplementary concerns about the extent to which inferences about WHS outcomes can be drawn reliably from an evaluation of the construct of culture. For example, Stauch argues,

> *Given the methodology used to assess culture… there is little assurance that having a 'good' safety culture will [necessarily] translate into few occupational accidents.*[53]

[47] Glick 1985.
[48] Neal, Griffin and Hart 2000.
[49] Fernandez-Muniz, Montes-Peon and Vazquez-Ordas 2012 p748; also Guldenmund 2000; Flin, Mearns, O'Connor and Byrden 2000.
[50] Bluff 2011, p29-31.
[51] Antonsen 2009, p252.
[52] Grote, C et al; HSE 1993. E.g. UK's Health & Safety Executive cites safety culture as characterised by communications founded on mutual trust, shared perceptions of the importance of safety and confidence in the efficacy of preventative measures.
[53] Strauch 2015, p106.

2. Leading safe and healthy work

In accepting responsibility for the design and implementation of organisational policy and strategy, target setting and allocation of resources, an organisation's leaders control the practical mechanisms for developing and sustaining a climate (and potentially a culture) of safety.[54]

An organisation's leaders are, therefore, instrumental in shaping its safety climate, regardless of the extent to which they may appreciate their role in that process.

2.1 Understanding injury causation

Individuals' behaviours and attitudes to WHS, whether they are managers or employees, are fundamentally shaped by their knowledge and understanding of injury and illness prevention.

At an organisational level, the beliefs held by leaders about the causes of injury/illness and opportunities for improvement will drive WHS strategy and performance management systems. For instance, if managers believe injuries are caused only by technical factors, their focus tends to be on technical solutions, whereas if they believe workers' behaviour is the cause, their attention will focus on behavioural interventions.

Knowledge of injury causation has evolved through a number of overlapping stages (or ages) in the past two centuries. These are summarised in Table 2.

This evolution in understanding has had a profound impact on the development of organisational systems and approaches for injury and illness prevention.

The 'Ages' of WHS Management		
Period	**Age**	**Understanding WHS**
1800s to post-WWII	**Technical**	Those injuries and illnesses that were caused by technical failure were seen as preventable. Focus was therefore on reporting incidents with technical causes and engineering practical measures and solutions to prevent future failures (e.g. the collapse of structures).
1920s-80s	**Human factors**	Recognising the role of human behaviour in injury and illness outcomes, emphasis moved to personnel selection, motivation and training, which were approached on the basis of theories about accident proneness and unsafe behaviours. This often led to a blame culture, within which attention focused on workers on the 'shop floor' and causal factors elsewhere in the organisation were ignored. It was viewed as superseding the previous, technical age (with an overlapping period).
1990s	**Management systems**	Merging the two previous ages, this period combined technical approaches to risk analysis and prevention with an understanding of human fallibility. This age emphasised the role of systems and rules in managing safety.
2000s to present	**Holistic** (also called the **Integration** or **Adaptive** age)	The holistic age builds on previous ages by recognising the various ways in which both technical and broader organisational factors affect the behaviour of managers, supervisors, employees and others. The holistic approach recognises the limitations of rule-based management systems, and that unforeseen events require flexible, adaptive and often immediate responses. Seeking to actively close the gap between defined procedures (work as imagined) and practice (work as performed), the holistic approach aims to integrate the key components of people (e.g. through genuine worker empowerment), engineering and organisational solutions.

Table 2. (Source: Adapted from Borys, Else and Leggett 2009[55])

[54] Hopkins 2002, p26.

[55] See also Hale and Hovden, 1998, p.129-130; Glendon, Clarke and McKenna 2006, p.407-8; Borys 2009; Hollnagel 2014; Rankin et. al 2015.

Managers need to understand the influence of technical, behavioural and organisational factors in injury and illness causation, but also to recognise how these factors interact and combine to create the conditions for failure.[56]

Research in this area has been particularly useful in demonstrating the chains of essential and contributing causal factors that existed prior to significant safety failures (see Figure 2).[57] Notably, detailed causal maps, such as Hopkins' analysis of essential and contributing factors preceding the 1998 ESSO Longford gas plant disaster, offer two important contributions. First they highlight the need to delve deeply into the organisational context when investigating incidents and, second, they demonstrate why the search for a single 'root cause' of an incident is not only futile, but potentially misleading and counter-productive. Many important risk factors may be overlooked and therefore remain uncontrolled.

In setting the strategic direction, priorities and tone of an organisation, it is the organisation's leaders who are in a position to address the type of organisational and corporate level hazards identified above. As Schein observes, "Leaders create [an organisational climate] by what they systematically pay attention to. This can mean anything from what they notice and comment on, to what they control, measure, reward and in other ways systematically deal with." [58]

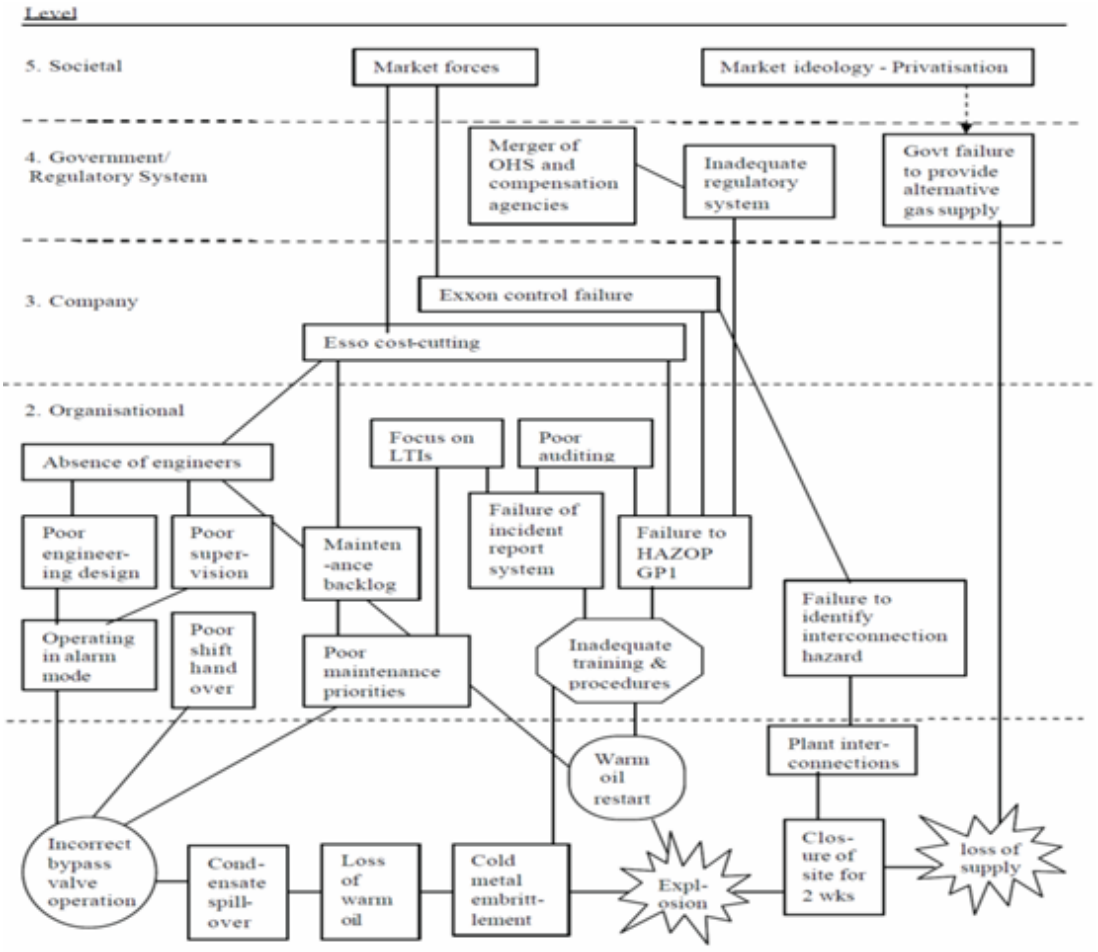


Figure 2: Causal map of the ESSO Longford disaster (Source Hopkins 2000, p.122)

[56] Reason 1997.
[57] See for example, Hopkins 2000, 2005, 2008.
[58] Schein 1992; Hopkins 2002.

2.2 Exercising due diligence

To make appropriately informed business decisions, organisational leaders need to understand the WHS risk factors that relate to the conduct of their business or undertaking. Australian WHS legislation[59] recognises this need and places explicit WHS due diligence obligations on every leader (officer[60]) of a business or undertaking.

The application of due diligence obligations to all officers is instructive. It reinforces that each officer participates, to some extent, in the financial, legal and operational decision-making that determines the work environment and its characteristics (e.g. WHS).

The due diligence obligations include a requirement for leaders to maintain an up-to-date awareness of the WHS risks and hazards generated by their business activity and to ensure that adequate resources and processes are available to eliminate, or else minimise, risks to workers' health and safety.

To reinforce the need to ensure decisions are appropriately informed regarding the WHS implications, the WHS Act also includes specific requirements for consulting with workers (s47-49) and worker representation (s50-102) on WHS matters.[61]

The six minimum due diligence obligations for officers are articulated in s27 of the *Work Health and Safety Act* (WHS Act). They may be broadly summarised as in Figure 3.

> *"[As a leader] you have a responsibility to try and ensure that you live the values of that role in the way you behave and interact. You've got to be passionate about making sure it happens; you can't just assume it will happen because you think it's a good thing. You have to demonstrate it by putting in the roles, the resources, the people, the behaviours, and the follow up, the feedback, everything you do. It's got to be a daily thing."* (General Manager) [62]

2.3 The WHS role of management

An organisation's officers and line managers play a critical role in both developing and maintaining a strong, positive safety climate.

The organisational policies, procedures, practices and routines to which employees are subject (as enacted and enforced by leaders) and the behaviours and events they observe occurring and being rewarded (by supervisors, managers and business leaders) are reflected in the organisational climate. The individuals' experiences and perceptions in turn shape and inform the collective shared beliefs, values and behaviours that constitute an organisation's culture and subcultures.

Sometimes managers are conscious of a need to improve their organisation's safety culture, or have been instructed by regulators to improve, but are unsure where to direct their focus. The WHS Act and preceding discussion on culture and climate present a framework for considering and driving improvement in WHS.

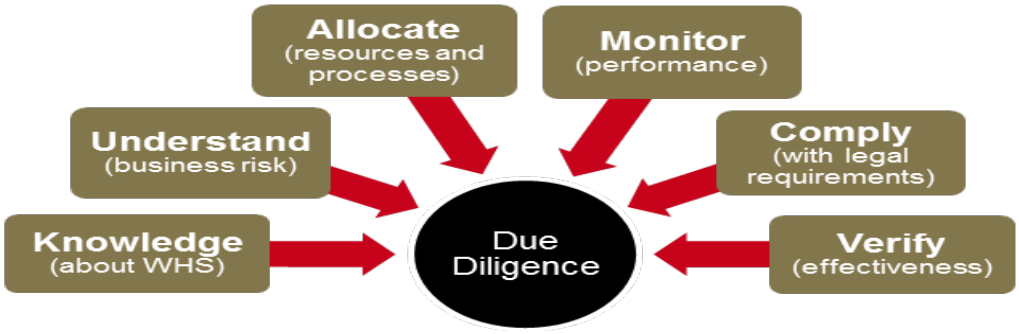


Figure 2: Officers' due diligence requirements
(Source: Adapted from Tooma 2012a,b p.3)

[59] See the model Work Health and Safety Act (2010) which has been enacted in all but two Australian jurisdictions.
[60] The WHS Act adopted the Corporations Act 2001 definition of 'officer'.
[61] Safe Work Australia 2012.

[62] Quotes in these boxes are taken from case studies undertaken as part of the Macquarie University, '*Role of Accounting in WHS Governance'* research project.

Researchers have described the "monotonous commonality" of organisational factors that have been implicated as causes in major accidents. These factors are frequently found to relate to cost cutting, deadlines, change management, outsourcing, and responses to external pressures.[63] They endanger the optimal functioning of the organisation and increase the likelihood of errors and risk.[64]

One potential starting point for WHS reform is to identify the organisational factors implicated in past injury or illness, and explore ways to eliminate them as latent (dormant) sources of errors or future injury and illness risk.

> *"The behaviours of the CEO and the leadership team actually determine the [safety climate] of the organisation. If they're just not interested, obviously then you're going to get an organisation that is not going to be focused on minimising risks."* (WHS Manager)

Eliminating latent organisational factors calls for due consideration of the corporate-level safety climate and subculture. This requires a critical review of management behaviours and practices that impact WHS. For example: incentives generated by performance systems, agreements, targets and rewards; the level of resourcing for maintenance, staffing or effective WHS control; procurement policy and practices; and even the framing and terminology in language used by supervisors and managers.

Together this underscores an important (but often misunderstood) principle in leading cultural change with respect to WHS:

> 'Change is led from the top' means change starts at the top.

Cultural change doesn't occur simply because management changes the policies or practices that govern the frontline employees. Directing managerial attention only to the practices of operational level workers (i.e. those at the 'coal-face' or 'shop floor'), has limited ability to improve WHS because it fails to address many of the organisational influences and pressures that contribute to each worker's day–to-day WHS experience.

> *"[W]orker behaviour can only ever account for a small part of the preventative action required in workplaces… [due to] the limited resources and power that workers have to bring about greater health and safety."* [65]

Furthermore, a failure to comprehend that the wider practices across an organisation are both derived from, and help determine, an organisation's culture, creates a tendency to,

> *…default to simplistic solutions that target symptoms of wider issues, such as installing guarding on machines rather than* [also] *considering the wider practices that lead to unguarded machines in the first place.*[66]

'Leading' remotely by directing change only in others (e.g. demanding safe behaviour from employees while retaining practices or policies that create unsafe conditions) has a negative impact on the important climate dimension: '*perceived management commitment to safety*'.[67] Risk factors originating from other parts of a business may be unacknowledged and unaddressed, although will not necessarily remain unseen.

This reinforces that management commitment is not simply a commitment to ensuring safety happens at the coal face, it is a commitment to ensuring all decisions made across the organisation impact positively on WHS.

> Safety leadership is therefore not about '*leading safety'*, it is about *leading (everything) safely.*

The way in which leaders try to influence WHS within their organisation affects the extent to which they succeed or fail in achieving their objectives. As highlighted in recent media reports, management style and the appropriate use of power[68] are important considerations in fostering engagement in safe and healthy work. So, too, are the managerial priorities and expectations evidentin performance management systems and organisational incentive schemes.[69]

[63] For example, Hopkins 2000, 2005, 2008, 2012.
[64] Reason 1997.
[65] Business leaders' health and safety forum 2013b.
[66] Borys 2014, p26.
[67] Recall the significance of this dimension from s1.4.
[68] Jones 2015, 2013.
[69] Bluff 2011; Petzall et. al. 1993; Hopkins and Maslen 2015.

3. Managing WHS performance

Managers who are removed from the daily operations of large, decentralised businesses use performance management systems to maintain control and deal with problems of information asymmetry [70]. Careful design is essential to their success. This requires that designers understand both the demands and complexities of the performance targets.

Performance management involves three essential processes:

- setting objectives,
- formulating strategy, and
- exercising control [71].

The steps involved are identified in Table 3.

Effective performance management systems consider measurement issues at each step. This ensures that key performance indicators (KPIs) are **relevant** (i.e. each one has a clear purpose so time and resources are not wasted capturing and analysing redundant or counter-productive data), and that each KPI is **valid** and **reliable** (i.e. it actually captures what it is believed to be measuring).

For example,
Objective: eliminate machine–body injuries**.** Strategies and processes to address the various essential and contributing risk factors for machine-body injuries may include:

- ***buy safe machines*** when the machines are replaced (supported by changes to asset procurement and consultation processes); and
- ***make existing machines safe*** (supported by activities such as engineering modifications and changes to guarding and plant layout); and
- ***change work practices*** (supported by new processes for undertaking maintenance and emergency shutdowns, and staff consultation and training activities).

Aspects of performance management	
Step	**Issues for consideration**
1. Objectives	What are the key objectives that are central to the organisation's overall future success? What would achievement look like for each objective, i.e. how would the organisation know when it has achieved its goals, how could this be communicated to decision makers?
2. Strategies and processes	What strategies and plans has the organisation adopted to achieve the objectives? What are the processes and activities that will be required to successfully implement the identified strategies and plans? What would successful implementation look like? How does the organisation assess performance in terms of processes and activities?
3. Measuring	What performance does the organisation need to achieve in each of the areas defined in the above two questions? How might relevant aspects of that performance be measured in a valid and reliable way? How does it go about setting performance targets for them, if appropriate?
4. Incentives (and penalties)	What rewards or benefits will managers (and other employees) gain by achieving these performance targets (or conversely, what penalties will they suffer by failing to achieve them)? Are the incentives counterproductive to honesty in reporting?
5. Learning	What are the information flows (feedback and feed-forward loops) that are necessary to enable the organisation to learn from its experience and to adapt its current behaviour in the light of that experience?

Table 3 (Source: Adapted from Otley 1999, pp.365-66)

[70] This is where, for example, the employee has relevant local information but the manager does not.
[71] Note, control incorporates measurement and incentives. Learning feeds into each step.

Once the objective(s) are set and strategies formulated, management control systems are engaged to guide strategy implementation and review. Management control systems include steps three to five from Table 3.

3.1 Organisational control systems

Performance management practices of measuring, incentivising and feedback are part of a broader management control system (MCS). MCS [72] are also known as internal control systems as they focus on regulating day-to-day activity within an organisation to ensure it meets its goals.[73]

MCS are concerned with ensuring each individual understands what is expected of them and has both the capability and motivation to conform to those expectations.

Management controls seek to address the risk of potential problems relating to:

- inadequate resources,
- competing incentives and pressures,
- inadequate training,
- poor direction,
- poor motivation, and
- personal limitations.

These controls seek to guard against the possibility that people will do something the organisation does not want or, conversely, that they will fail to do something that the organisation does want.

> *"The crucial aspect of any control system is its effect on behaviour… The system needs to be designed in a way that assists, guides and motivates management [and others] to make decisions and act in ways that are consistent with the overall objectives of the organisation."*[74]

Because MCS regulate the way work activity occurs within each organisation, they are an important influence on the way individuals experience and perceive their work.

Well-designed management control systems:

- focus attention on areas that are a priority for the organisation
- align the organisation's performance with strategic objectives
- improve worker and manager job satisfaction, and
- encourage continuous improvement.[75]

The controls that MCS employ to regulate organisational behaviour fall into three broad types: resource-oriented, action-oriented, and result-oriented controls.[76]

Resource-oriented controls

The primary purpose of resource-oriented controls is to help individuals perform well. From a WHS perspective, they are the mechanisms by which management facilitates safe and healthy work.

Resource-oriented controls emphasise the importance of **designing safe, healthy and productive work and allocating appropriate resources**. Activities include ensuring that the business recruits, selects and places the 'right' people, that job design is appropriate, that training builds timely and relevant knowledge and skills, and that all necessary resources (human, physical and financial) are available as and when required.

Together resource-oriented controls serve to:

- **clarify expectations** regarding what the organisation wants from individuals,
- **ensure employees have the capability** (training, experience, competence) and the **capacity** (i.e. adequate time, information, equipment, support and other resources) required to perform well, and
- increase the likelihood of **self-monitoring** (underpinned by a combination of self-control, intrinsic motivation, ethics, trust and loyalty), in that they want to perform well and see the organisation succeed. [77]

Resource controls may be reinforced through the use of group controls, or what Merchant and Ven der Stede refer to as "cultural" controls. These include codes of conduct and team-based objectives as well as physical and social arrangements, such as open plan

[72] As opposed to *strategic control systems* which review the appropriateness and validity of the organisation's goals within the organisation's external (industry, regulatory and social) context.
[73] Merchant and Van der Stede 2012, p4-5.
[74] Merchant and Van der Stede 2012, p5.
[75] Ukko, Tenhunen and Rantanen 2007, p.41.
[76] Adapted from Merchant and Van der Stede 2012.
[77] Merchant and Van der Stede 2012.

offices or company dress codes. These reinforce conformance with expectations through mutual (peer) monitoring and social pressure.[78]

Importantly, the perceived quality of resource controls (with respect to enabling safe work) is a significant driver of an organisation's safety climate.

Resource controls are evident in all WHS risk management systems and are reinforced in WHS legislation (e.g. regulatory requirements for adequate resourcing, training etc.). However, while resource-oriented controls are essential, they are not sufficient to ensure the WHS goals are met.

Action-oriented controls

Action-oriented controls seek to ensure that individuals perform (or do not perform) certain actions known to be beneficial (or harmful) to the organisation. They are effective *only* where managers are confident in their understanding as to which actions are desirable or undesirable and are also able to ensure that those actions do (or don't) occur.[79]

There are two types of action controls. Group 1 action controls are most effective. These are:

- ***Physical and administrative constraints***. The constraints aim to significantly minimise, if not eliminate risk by making it extremely difficult to act in undesirable ways. Some refer to this as making a task "foolproof".

  Physical constraints include locks, security screens, cages and barriers and other engineering or isolation modifications that restrict access or prevent inadvertent and/or dysfunctional actions.

  Examples of administrative constraints are passwords, separation of duties, mandatory consultation requirements and strict limits on decision-making authority.

Although potentially *less effective in preventing* unwanted actions, Group 2 action controls are:

- ***Accountability constraints*** that seek to hold individuals accountable for the actions they take or fail to take. These require managers to first identify those actions that benefit the organisation, communicate these clearly to employees – usually through rules, policies, contracts, etc., and then hold employees accountable for their (in)actions.
- ***Pre-action reviews*** where actions require a formal or informal review and supervisor's sign-off prior to being taken. These controls are often used with inexperienced employees.
- ***Excess capacity*** where operational slack is intentionally built into the system so more people, equipment or other resources are available than is theoretically necessary. This aims to minimise risk by ensuring the necessary backup, support and resources are available if and when required (e.g. for unplanned absences, unexpected break-downs or other system failures).

Some action controls are mandated by WHS legislation. For example, **ensuring adequate supervision** is an important action control as it potentially contributes to all three of the Group 2 action control functions (i.e. accountability, pre-action and excess capacity).

Result-oriented controls

Result-oriented controls operate by rewarding individuals (or groups) for achieving desired performance and punishing them for poor performance. These are potentially the most challenging to implement as their success hinges on a number of criteria being met:

- managers must be able to identify and clearly describe appropriate dimensions and target levels of performance
- managers must clearly articulate the order of priority in the event that multiple targets conflict or complete
- individuals or teams must be ability to exert control over each performance dimension
- identified rewards and sanctions must align with the stated priority of performance targets, and
- identified rewards and sanctions must actually motivate individuals to achieve the target result.

Rewards (sanctions) can be anything of value to those who will be subject to the controls. These include the gain (or loss) of intrinsic outcomes such as a personal sense of pride or accomplishment; or extrinsic outcomes such as better work assignments, greater freedom,

[78] Merchant and Van der Stede 2012, p.90-95.
[79] Merchant and Van der Stede 2012, p27.

autonomy, recognition or power, training opportunities, job security, bonuses, salary increases and promotions.

Incentive schemes are formalised efforts to motivate desired behaviour through result-oriented controls. They offer a pre-determined reward, often financial in nature, for achieving a pre-stated target or goal.

The careful design of an incentive scheme is essential. For incentive schemes to succeed, the objective on which the reward depends must be within the day-to-day control of each individual participating in the scheme. Also, the target level of performance, or goal, must be challenging but achievable.

Depending on its design, an incentive scheme can be a powerful mechanism for securing (or for undermining) safe and healthy work.

3.2 Evaluating performance

The primary reason for measuring an aspect, or characteristic, of performance is to obtain useful (relevant, valid and reliable) information to support organisational decision making[80].

Measuring performance typically has one of two primary objectives:

- To EXPLORE KPIs aim to provide insight or new knowledge about some existing activity, phenomenon, or attribute of the business environment (i.e. to help **understand** performance). For example, to discover whether there might be a relationship between staff rosters and fatigue-related incidents, or
- to TRANSFORM. KPIs seek to motivate desired behaviour or results (i.e. to help **change** performance). For example, to drive a reduction in injuries.

Importantly, even where the aim is exploratory, the very act of measuring performance can have an **unintended transformative result** (see, for example, the 'Hawthorne effect'[81]).

WHS due diligence obligations require leaders to implement processes for receiving and considering information on WHS performance (that is, information about WHS hazards, risks and incidents), and then responding to that information in a timely manner[82].

Relying on a single, aggregated measure of injury performance cannot provide adequate due diligence information on incidents,[83] let alone offer reliable information to managers and other decision makers about WHS risk factors and the implementation and effectiveness of relevant control mechanisms.

Evaluating WHS performance involves:

- Identifying and understanding the factors that promote safe and healthy work and the hazards that pose a risk to safe and healthy work. This includes factors that exist at an operational level, or are interdepartmental or corporate in origin.
- Developing and implementing controls to address these factors appropriately and then using lead performance indicators to verify the implementation and effectiveness of those controls (particularly for critical risk controls).
- Monitoring the frequency and severity of injury and illness occurrences. The purpose is two-fold. First injury outcomes offer a way of demonstrating where controls are <u>not</u> working as intended.[84] Second this performance data can assist in identifying new hazards that need to be addressed.

Together, this performance information equips operational managers with a comprehensive WHS performance data set to inform their daily WHS and production decisions.

Relevant WHS information for organisational leaders can also be extracted from the data set and incorporated into holistic management communication and reporting tools, such as Kaplan and Norton's 'balanced scorecard'.[85]

[80] Ukko, Tenhunen and Rantanen, 2007 p.39.

[81] The Hawthorne experiment demonstrated an 'observer effect' (known as the 'Hawthorne effect') whereby individuals modified their behaviour after becoming aware that they were being observed. See Parsons 1974; Neal et. al. 2000.

[82] See in particular, WHS Act, Section 27(5)(d,f).

[83] O'Neill et al 2015; Collins 2013; Bluff 2011.

[84] Relying on injury data as a primary method of inferring the effectiveness of controls can be seriously misleading because injury data fails to take latent hazards (and sheer good luck) into account.

[85] Kaplan and Norton 1992.

Communicating performance

A balanced scorecard is one tool that aims to summarise and communicate data relevant to the organisation's vision and strategies. It includes information on financial performance, organisational capacity, stakeholder/customer satisfaction and measures of internal business processes efficiency, such as WHS.[86]

Clearly, the performance measures used for decision-making need to be relevant to the business decisions they are seeking to inform. Yet many businesses have been slow to replace the traditional lost time injury rates with lead and lag WHS measures that are capable of providing more meaningful WHS performance information for decision makers.

Performance data also needs to be valid. That is, KPIs should actually measure what they claim to measure. For example, to measure and communicate the number of slips and trips, users need both a clear and agreed understanding of what a 'slip' or 'trip' actually is and a way of reliably measuring those constructs. Otherwise performance data might be interpreted differently by different users.

Where it is not possible (or not economically feasible) to measure a desired aspect of performance, then a relevant proxy needs to be identified. It is important to critically examine the extent to which the proxy reliably represents the subject of interest. If there is a potential for a material variance, this should be explicitly identified as a limitation.

Together this enables users to understand what a KPI measures, and what it does not measure, so they can sensibly determine its relevance to different business decisions on a case-by-case basis.

3.3 (Un)intended consequences

Understanding the transformative power of performance measures allows managers to identify the KPIs most likely to motivate the actions needed to achieve organisational goals and objectives.[87]

As noted above, even KPIs that are 'intended' to be exploratory have potential to generate unintended behaviours. This occurs because **i**ndividuals are motivated to behave in ways that optimise the performance outcomes against which they perceive they may be assessed.

However, rather than motivating individuals in intended ways, poorly designed management systems and inappropriately selected KPIs have the potential to demotivate those who are subject to them, or to motivate dysfunctional behaviours and unintended consequences.[88]

Poor alignment between organisational and safety goals, or between goals, controls and KPIs, sends inconsistent signals that can undermine the organisation's safety climate.

Designers of performance management and internal control systems therefore need to critically examine the potential to motivate both intended AND unintended behaviours, and to consider possible ways to prevent or mitigate any foreseeable behaviours or consequences that are unwanted or counter-productive.

Ultimately, the extent to which KPIs succeed in driving desired changes in performance will hinge on the degree of alignment between:

- ⇨ the performance **measure (KPI)**,
- ⇨ the **behaviour** that measure motivates (intended and/or unintended), and
- ⇨ the organisation's **goal**/s.

Competing incentives

These principles apply to the various financial, production and operational goals that coexist within an organisation. It is important to understand how the pursuit of each may impact WHS performance. For example, the pursuit of specific financial and/or production goals may support, or conversely undermine, an organisation's efforts to improve WHS.

When there is an unavoidable tension between the strategic goals, processes or activities, (e.g. production targets and WHS targets), management need to clearly identify and actively reinforce their highest priority.

[86] Otley 1999.
[87] Ukko, Tenhunen and Rantanen, 2007 p.39.
[88] Scarlett and Wilks 2003, p.39-40; Ukko, Tenhunen and Rantanen 2007 p.39.

Priorities are reinforced through the careful design of performance management systems (performance targets and rewards) since **individuals will rationally seek to maximise their reward by pursuing the target that offers the greatest incentive.**

> *"It's about understanding what you're really going to change, because people always find a way to get to the money. So you've got to get it right and make sure you drive the right behaviours."* (Chief Executive Officer)

Performance targets

Arguably the most prevalent performance targets employed in WHS management control systems are injury rates, such as lost time injury frequency rates (LTIFR) or total recordable injury frequency rate (TRIFR). Their use is aimed at drawing attention to the number of injury occurrences in the hopes of motivating improvement by reinforcing the need to control risk and improve resilience.

This reliance on a single injury rate as a generic, all-purpose indicator of WHS performance continues in spite of its many criticisms. These relate both to data quality (reliability and validity) and to the poor nexus between the injury rates and managerial decisions.

In the absence of a reporting culture, focusing on injury results is likely to drive people to 'manage the measure'. For example, by concealing or reclassifying injuries so results improve, on paper, even though actual performance remains unchanged.

Evidence has demonstrated how employee incentive schemes based around reductions in injury rates are inherently flawed since many causal factors are not within the employees' control. Consequently, in the absence of a strong reporting culture, these schemes tend to motivate under-reporting of injury. Where operated as collective arrangements, they can lead to peer pressure for under reporting, and to injured workers being blamed and bullied for the team's lost reward or bonus.

A 2009 US Occupational Safety and Health Administration (OSHA) audit found up to two-thirds of all workplace injuries and illnesses went unreported due to factors such as fear of disciplinary action or the loss of valued incentives[89]. In March 2012, OSHA issued a memorandum (see Appendix 1) advising:

> "If an employee of a firm with a safety incentive program reports an injury, [and as a result] the employee, or the employee's entire work group, will be disqualified from receiving the incentive – [this] could be considered unlawful discrimination."[90]

Concerns over the unintended and often dysfunctional consequences of employee incentive schemes based on injury rates have prompted calls to focus instead on (leading) indicators of WHS risk reduction[91] and to be mindful of the impact of group incentives on peer pressure and workplace collegiality.

The search for alternative targets to drive WHS performance has focused on the development of various lead and lag indicators that can offer more meaningful insights into WHS resilience and when incorporated into performance management systems, can reduce incentives for dysfunctional behaviour.

Table 4 provides some examples of intended and unintended consequences for a small selection of commonly used WHS KPIs.

Performance rewards

Also evident is increasing attention to incentive schemes that focus on financial performance, or more specifically on cost reduction, with no countermanding incentive to ensure WHS risks are managed effectively. The impact of these types of arrangements on senior management behaviour is claimed to have been implicated in numerous industrial disasters, such as the 2005 BP Texas City explosion.[92]

Given cultural change is fostered through the influence of climate and an organisation's safety climate is shaped by management's policies, behaviours, attitudes and decisions, this provides a compelling argument for close attention to the structure and content of those

[89] Beus et. al. 2010.
[90] See Appendix 1
[91] For example, NSW Mine Safety Advisory Council 2007. Although Sparer and Dennerlein (2013) suggest research is yet to demonstrate their success, or otherwise.
[92] Hopkins 2008, 2010.

incentives used to motivate boards and senior managers.

Executive incentives

The competing priorities vying for the attention of senior management are well documented. Similarly, their attention to WHS is variously motivated by legal, economic and reputational concerns as well as a moral commitment to preventing harm[93].

Given a key role of performance management systems is to clarify and communicate the organisation's priorities, management's WHS (sub) culture is likely to be influenced by the structure and content of executive employment contracts and bonus schemes.

Useful insights are provided by Hopkins and Maslen's[94] recent examination of the executive bonus arrangements for a sample of companies operating in hazardous industries. Among their detailed findings and conclusions are the following:

1. In nearly all cases, the CEOs received incentives that far exceeded their fixed pay. These comprised both a short-term incentive (annual bonus) and long-term incentive payment.[95].
2. Most **annual bonus** criteria tended to include a small percentage relating to safety performance.
    - These typically focused on injury rates such as LTIFR or TRIFR, although in some cases the requirement for safety-related activity was evident.
    - The safety criteria were subjectively applied in bonus calculations. In one example, Hopkins and Maslen noted a company that was assessed to have performed 'marginally above target' despite two workplace fatalities and an injury rate 'well above target'. The exception was one organisation that applied the absence of fatal injury as a threshold criterion before the safety component of the bonus was paid[96].

Like the organisation identified by Hopkins and Maslen, one organisation in our current research sample[97] reported a safety threshold for bonus payments. This organisation sought to address competing financial and WHS performance incentives by requiring the absence of fatality and total permanent disability to be met before <u>any</u> executive annual bonus could be paid (not just the safety component of the bonus).

> *"Look, my goals tend to be around financial performance, that's the starting point. But one of the things we built into the [bonus] scheme is hurdles. This is an extreme thing, but you can guarantee if we ever had a death onsite then no one's getting paid any [of the bonus]."* (Chief Operating Officer)

3. Hopkins and Maslen also found that **long-term incentives** were paid almost entirely on financial performance. Since these constituted the largest component of CEO remuneration, the composition was said to render safety performance" essentially irrelevant" to the achievement of the financial reward. Their impact on safety therefore needs "careful (re)consideration" (p.75).

Overall, Hopkins and Maslen found executive incentive structures to motivate a short-term orientation to organisational performance and to potentially pose a strong disincentive to spending on health and safety. The findings are consistent with prior research that suggests organisations are often forced to choose between WHS and profit, and WHS actions are shaped by managers' beliefs as to what is required to ensure the organisation's future success.[98]

This underscores the critical importance of the personal liability provisions in WHS legislation. A potential for financial or custodial penalties in response to a failure to exercise WHS due diligence,[99] presents an important incentive for senior managers to pay due regard to ensuring safe and healthy work..

[93] Bluff 2011.
[94] Hopkins and Maslen 2015.
[95] Hopkins and Maslen 2015, p.61.
[96] Hopkins and Maslen 2015, p.82-83.
[97] These case studies were undertaken as part of the Macquarie University, 'Role of Accounting in WHS Governance' project.
[98] Bluff 2011.
[99] Tooma 2012; WHS Act 2010.

Some examples of intended and unintended consequences of injury performance measurement				
Performance measure	**Informs about:**	**Key limitations:**	**Intended consequences:**	**Unintended consequences:** **(if foreseen these may be able to be mitigated)**
LTIFR: Lost time injury frequency rate	The frequency of compensated injuries involving at least one full day absence from work – Typically this is highly correlated with high frequency, but low consequence injury outcomes	• Misinterpreted as providing a measure: – of total injury and illness, or – of 'serious' injury and illness[100] • Provides no guide to the cause of injury or specific outcomes so is inappropriate to guide decisions relating to WHS strategy, policy and resource allocation	• Provide insight into incidents that result in lost productivity • Motivate injury prevention	• Motivates **under-reporting** (hiding) or **mis-reporting** (incorrectly classifying) injury and illness occurrences • May lead to **bullying** of injured workers, or **pressure** for premature return to work Low LTIFR may be **falsely interpreted** as evidence that WHS risk is well controlled
TRIFR: Total recordable injury frequency rate	Frequency of compensated injuries – This measure is also highly correlated with high-frequency, but low-consequence injury outcomes – It captures a more complete set of injury outcomes than LTIFR	• Aggregates a disproportionately large number of low-consequence injuries and therefore is a poor indicator of injury severity	• Provide insight into the frequency of incidents that result in damage to people at work • Motivate injury prevention	• May motivate **under-reporting** (hiding) of incidents • May lead to **bullying** of injured workers, or **pressure** on workers not to report injuries • May lead to **costly alternatives** being applied e.g. paying for onsite doctors to class medical treatment injuries as onsite first aid
Class 1: Injuries resulting in death or permanent disability or disfigurement	The life altering damage to people that has occurred at work – This measure is also correlated with both the unit cost of injury and the externalities (or impact on society)	• May be difficult to assess whether an injury is temporary or permanent (Note: the reference to time to recovery, not return to work)	• Focus attention on risks that lead to high consequence and high cost incidents (and damaged reputation)	• Safety **record** may appear poor compared to those who adopt a less transparent approach • May pose an incentive to **hide** the seriousness of injury (e.g. serious musculoskeletal damage)
Number of reported incidents	The number of events (injuries, illnesses, and high potential incidents) that have occurred over a stated period	• Informs about the number of reports but not the timeliness, or seriousness. – *Complementary indicators include: % incidents reported within 24 hours, # reported Class 1 events.*	• Encourage (timely) reporting of hazards and incidents • Comprehensive collection of near miss to serious events for trending and analysis	• Increasing numbers of reports may be **misinterpreted** as negative. • **Spurious reports** of hazards may be submitted to boost the level of 'performance' (and absorb unnecessary investigation resources)
Number of incident investigations closed (with corrective actions identified)	The number of injury, illness or hazard investigations that have been completed	• Does not assess the quality/outcome of the investigation	• Encourage completion of outstanding investigations and resolution of identified hazards and risks	• May motivate quick and superficial investigations – May mitigate by instead measuring # or % of investigations **closed to schedule**, • May promote easy and low level risk controls – May mitigate by instead analysing actions arising from the investigation by the hierarchy of control level (e.g. a pie chart showing % actions taken to eliminate risk, vs minimise risk, vs PPE/admin vs no action)
Percentage of officers trained in WHS matters	The extent to which officers are prepared and capable of undertaking WHS due diligence	• Competence depends on the type and quality of training provided	• Ensure all officers understand their role in WHS governance	• May motivate provision of short training courses that tick the compliance box but are divorced from the reality of the business

Table 4 Examples of intended and unintended consequences for some commonly used WHS KPIs

[100] Different definitions of 'serious injury' are evident, including injuries requiring more than one day absence, more than one week absence or involving a long-term impairment

4. Conclusion

Ensuring safe and healthy work is the collective responsibility of all individuals within an organisation. When this is done well, organisations are perceived to demonstrate a culture of safety,

> "*core values and behaviours [derived] from a collective commitment by leaders and individuals to emphasise safety over competing goals, to ensure the protection of people and environment*."[101]

Supporting the strong safety climate required to maintain a culture of safety requires goal congruence at all levels. Unless performance management systems work to align WHS objectives with both managerial and employee activity, then mismatched priorities and dysfunctional consequences are inevitable.

Performance measures themselves must be capable of demonstrating the progress made in both increasing WHS resilience (including implementation and effectiveness of defenses) and reducing injury and illness occurrences. The transformative power of the performance measures serves to reinforce these objectives.

Testing the safety climate gives important insight into individuals' perceived experiences of the WHS systems and practices to which they are subject, but is no substitute for seeking detailed and direct evidence of the performance of those systems and practices.

> *As the boy said to the farmer, 'I bought a plant in a pot and I measure it every week but why doesn't it grow?' The farmer replied, 'a measuring stick does not make it grow. It needs water, nutrients, sunshine and protection from the wind. These are the things to see and do. These make your plant grow'.*[102]

Despite the need for commitment at all levels, it is the organisation's leaders who are ultimately responsible for developing strategy, setting priorities, allocating resources and managing WHS performance. In doing so, they are instrumental in shaping the safety climate that can inform change, for better or worse, in an organisation's safety culture(s).

To lead safety, leaders must lead safely.

Authentic leaders unambiguously demonstrate an active commitment to WHS. They build systems and structures that incorporate WHS in a very practical way into all aspects of day-to-day work. Leaders nurture organisational commitment to strengthening (in all areas and at all levels) the policies, practices, routines, behaviours and rewards that facilitate safe and healthy work. Leaders also eliminate, or at least deal appropriately and constructively[103], with policies and procedures that potentially undermine WHS.

Leading safe and healthy work requires:

1. **Trust** – welcoming bad news, actively and consistently prioritising safety and wellbeing to demonstrate it is a primary organisational goal.
2. **Communication** – promoting cooperation, inspiring compliance, fostering group goals and providing individualised support to foster quality interactions between managers and workers.
3. **Achieving the achievable** – recognising the factors that can be changed at each level and implementing as many safety defenses as possible within their own sphere of influence.
4. **Expertise and skills** – having a sound understanding of the industry and business to be able to 'ask the important questions'.
5. **Visible leadership** – being 'on the ground', 'getting out and looking around'; not to police the workforce, but to get to know the business, the sites, the people and to lead by example. [104]

When asked about the role of leaders in securing safe and healthy work, one research participant reiterated the need for active, visible leadership, saying,

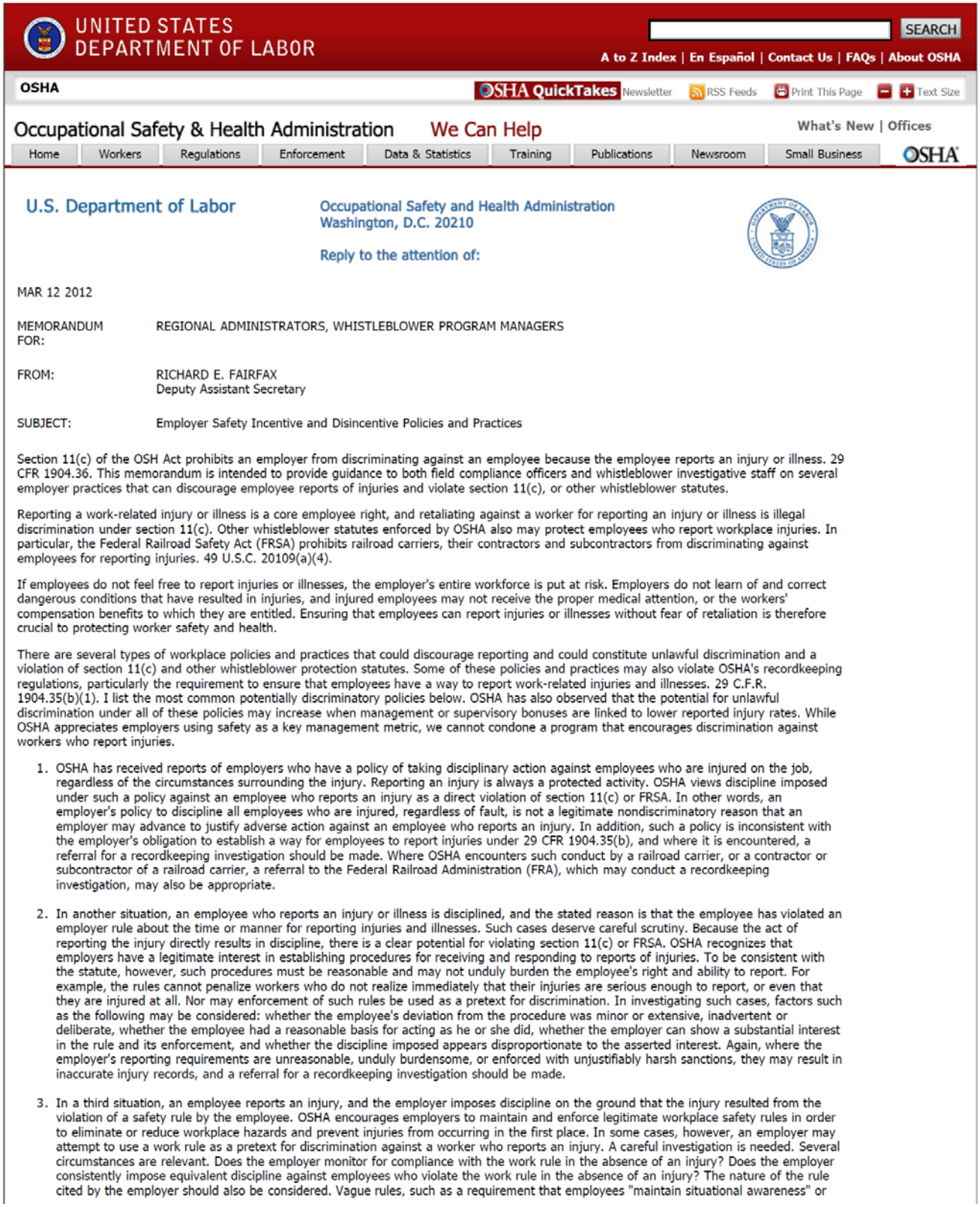
> *Really, the only way to credibly demonstrate a passion for safety is by getting personally involved. It's about boots on the ground and skin in the game.*[105]

[101] INPO "Traits of Healthy Nuclear Safety culture".
[102] Anonymous.
[103] Antonsen 2009; Bluff 2011.
[104] Reason 1997; Torner 2011; ARPANSA 2012; Torner 2011; Business Leaders Health & Safety Forum 2013a.
[105] Business Leaders Health & Safety Forum 2013b.

5. Appendices

5.1 Appendix 1 – OSHA Memorandum

Employer Safety Incentive and Disincentive Policies and Practices Memorandum



UNITED STATES DEPARTMENT OF LABOR

SEARCH

A to Z Index | En Español | Contact Us | FAQs | About OSHA

OSHA | OSHA QuickTakes Newsletter | RSS Feeds | Print This Page | Text Size

Occupational Safety & Health Administration — We Can Help — What's New | Offices

Home | Workers | Regulations | Enforcement | Data & Statistics | Training | Publications | Newsroom | Small Business | OSHA

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210

Reply to the attention of:

MAR 12 2012

MEMORANDUM FOR: REGIONAL ADMINISTRATORS, WHISTLEBLOWER PROGRAM MANAGERS

FROM: RICHARD E. FAIRFAX
Deputy Assistant Secretary

SUBJECT: Employer Safety Incentive and Disincentive Policies and Practices

Section 11(c) of the OSH Act prohibits an employer from discriminating against an employee because the employee reports an injury or illness. 29 CFR 1904.36. This memorandum is intended to provide guidance to both field compliance officers and whistleblower investigative staff on several employer practices that can discourage employee reports of injuries and violate section 11(c), or other whistleblower statutes.

Reporting a work-related injury or illness is a core employee right, and retaliating against a worker for reporting an injury or illness is illegal discrimination under section 11(c). Other whistleblower statutes enforced by OSHA also may protect employees who report workplace injuries. In particular, the Federal Railroad Safety Act (FRSA) prohibits railroad carriers, their contractors and subcontractors from discriminating against employees for reporting injuries. 49 U.S.C. 20109(a)(4).

If employees do not feel free to report injuries or illnesses, the employer's entire workforce is put at risk. Employers do not learn of and correct dangerous conditions that have resulted in injuries, and injured employees may not receive the proper medical attention, or the workers' compensation benefits to which they are entitled. Ensuring that employees can report injuries or illnesses without fear of retaliation is therefore crucial to protecting worker safety and health.

There are several types of workplace policies and practices that could discourage reporting and could constitute unlawful discrimination and a violation of section 11(c) and other whistleblower protection statutes. Some of these policies and practices may also violate OSHA's recordkeeping regulations, particularly the requirement to ensure that employees have a way to report work-related injuries and illnesses. 29 C.F.R. 1904.35(b)(1). I list the most common potentially discriminatory policies below. OSHA has also observed that the potential for unlawful discrimination under all of these policies may increase when management or supervisory bonuses are linked to lower reported injury rates. While OSHA appreciates employers using safety as a key management metric, we cannot condone a program that encourages discrimination against workers who report injuries.

1. OSHA has received reports of employers who have a policy of taking disciplinary action against employees who are injured on the job, regardless of the circumstances surrounding the injury. Reporting an injury is always a protected activity. OSHA views discipline imposed under such a policy against an employee who reports an injury as a direct violation of section 11(c) or FRSA. In other words, an employer's policy to discipline all employees who are injured, regardless of fault, is not a legitimate nondiscriminatory reason that an employer may advance to justify adverse action against an employee who reports an injury. In addition, such a policy is inconsistent with the employer's obligation to establish a way for employees to report injuries under 29 CFR 1904.35(b), and where it is encountered, a referral for a recordkeeping investigation should be made. Where OSHA encounters such conduct by a railroad carrier, or a contractor or subcontractor of a railroad carrier, a referral to the Federal Railroad Administration (FRA), which may conduct a recordkeeping investigation, may also be appropriate.

2. In another situation, an employee who reports an injury or illness is disciplined, and the stated reason is that the employee has violated an employer rule about the time or manner for reporting injuries and illnesses. Such cases deserve careful scrutiny. Because the act of reporting the injury directly results in discipline, there is a clear potential for violating section 11(c) or FRSA. OSHA recognizes that employers have a legitimate interest in establishing procedures for receiving and responding to reports of injuries. To be consistent with the statute, however, such procedures must be reasonable and may not unduly burden the employee's right and ability to report. For example, the rules cannot penalize workers who do not realize immediately that their injuries are serious enough to report, or even that they are injured at all. Nor may enforcement of such rules be used as a pretext for discrimination. In investigating such cases, factors such as the following may be considered: whether the employee's deviation from the procedure was minor or extensive, inadvertent or deliberate, whether the employee had a reasonable basis for acting as he or she did, whether the employer can show a substantial interest in the rule and its enforcement, and whether the discipline imposed appears disproportionate to the asserted interest. Again, where the employer's reporting requirements are unreasonable, unduly burdensome, or enforced with unjustifiably harsh sanctions, they may result in inaccurate injury records, and a referral for a recordkeeping investigation should be made.

3. In a third situation, an employee reports an injury, and the employer imposes discipline on the ground that the injury resulted from the violation of a safety rule by the employee. OSHA encourages employers to maintain and enforce legitimate workplace safety rules in order to eliminate or reduce workplace hazards and prevent injuries from occurring in the first place. In some cases, however, an employer may attempt to use a work rule as a pretext for discrimination against a worker who reports an injury. A careful investigation is needed. Several circumstances are relevant. Does the employer monitor for compliance with the work rule in the absence of an injury? Does the employer consistently impose equivalent discipline against employees who violate the work rule in the absence of an injury? The nature of the rule cited by the employer should also be considered. Vague rules, such as a requirement that employees "maintain situational awareness" or

http://www.osha.gov/as/opa/whistleblowermemo.html[26/05/2012 12:54:00 PM]

"work carefully" may be manipulated and used as a pretext for unlawful discrimination. Therefore, where such general rules are involved, the investigation must include an especially careful examination of whether and how the employer applies the rule in situations that do not involve an employee injury. Enforcing a rule more stringently against injured employees than noninjured employees may suggest that the rule is a pretext for discrimination against an injured employee in violation of section 11(c) or FRSA.

4. Finally, some employers establish programs that unintentionally or intentionally provide employees an incentive to not report injuries. For example, an employer might enter all employees who have not been injured in the previous year in a drawing to win a prize, or a team of employees might be awarded a bonus if no one from the team is injured over some period of time. Such programs might be well-intentioned efforts by employers to encourage their workers to use safe practices. However, there are better ways to encourage safe work practices, such as incentives that promote worker participation in safety-related activities, such as identifying hazards or participating in investigations of injuries, incidents or "near misses". OSHA's VPP Guidance materials refer to a number of positive incentives, including providing tee shirts to workers serving on safety and health committees; offering modest rewards for suggesting ways to strengthen safety and health; or throwing a recognition party at the successful completion of company-wide safety and health training. *See Revised Policy Memo #5 - Further Improvements to VPP* (June 29, 2011).

   Incentive programs that discourage employees from reporting their injuries are problematic because, under section 11(c), an employer may not "in any manner discriminate" against an employee because the employee exercises a protected right, such as the right to report an injury. FRSA similarly prohibits a railroad carrier, contractor or subcontractor from discriminating against an employee who notifies, or attempts to notify, the railroad carrier or the Secretary of Transportation of a work-related personal injury. If an employee of a firm with a safety incentive program reports an injury, the employee, or the employee's entire work group, will be disqualified from receiving the incentive, which could be considered unlawful discrimination. One important factor to consider is whether the incentive involved is of sufficient magnitude that failure to receive it "might have dissuaded reasonable workers from" reporting injuries. *Burlington Northern & Santa Fe Railway Co. v. White*, 548 U.S. 53, 68 (2006).

   In addition, if the incentive is great enough that its loss dissuades reasonable workers from reporting injuries, the program would result in the employer's failure to record injuries that it is required to record under Part 1904. In this case, the employer is violating that rule, and a referral for a recordkeeping investigation should be made. If the employer is a railroad carrier, contractor or subcontractor, a violation of FRA injury-reporting regulations may have occurred and a referral to the FRA may be appropriate. This may be more likely in cases where an entire workgroup is disqualified because of a reported injury to one member, because the injured worker in such a case may feel reluctant to disadvantage the other workgroup members.

Please contact the Office of Whistleblower Protection Programs at (202) 693-2199 if you have further questions.

6. References

(2001). Corporations Act. Australian Federal Government. Canberra.

(2010). Model Work Health and Safety Act. Safe Work Australia. Canberra, Safe Work Australia.

Antonsen, S. (2009). *Safety culture and the issue of power*. Safety Science **47**(2): 183-191.

Antonsen, S, Skarholt, K & Ringstad, A.J, (2012) *The role of standardization in safety management – A case study of a major oil & gas company* Safety Science **50**: 2001–2009.

ARPANSA (2012). *Holistic Safety Guidelines.* Operations services os-la-sup-240u. Canberra.

Beus, J.M, Payne, S. C, Bergman, M & Arthur, W Jr, (2010) Safety Climate and Injuries: *An Examination of Theoretical and Empirical Relationships* Journal of Applied Psychology, **95**(4): 713–727.

Bluff, L. (2011). Something to Think About – Motivations, Attitudes, Perceptions and Skills in Work Health and Safety. Safe Work Australia. Canberra.

Borys, D. (2009). *Exploring risk-awareness as a cultural approach to safety: exposing the gap between work as imagined and work as actually performed*. Safety Science Monitor, 13(2)(3): 1-11.

Borys, D. (2014). *Organisational Culture*. OHS Body of Knowledge. Safety Institute of Australia. Tullamarine, Victoria.

Borys, D., Else, D. & Leggett, S. (2009). *The fifth age of safety: The adaptive age?* Journal of Health & Safety Research & Practice, **1**: 19-27.

Braithwaite, V. (2011). Motivations, Attitudes, Perceptions, and Skills: Pathways to Safe Work. Safe Work Australia. Canberra.

Business Leaders' Health & Safety Forum (2012). Safety - one of the toughest leadership challenges. Jeremy Smith - Holcim. Wellington: Zero Harm Workplaces. July

Business Leaders' Health & Safety Forum (2013a). Pike River: Lessons for directors and senior leaders. Wellington: Zero Harm Workplaces. April

Business Leaders' Health & Safety Forum (2013b). What is safety leadership? Rob Jager - Chair, Shell Companies in New Zealand. Wellington: Zero Harm Workplaces. August

Business Leaders' Health & Safety Forum (2013c). Building a reporting culture - the CEO's role. Ed Sims - Airways New Zealand. Wellington: Zero Harm Workplaces. September

Choudry, R., Fang, D. & Mohamed, S. (2007). The nature of safety culture: A survey of the state-of-the-art. Safety Science, **45**: 993-1012.

Clayton, A. (2002) *The Prevention of Occupational Injuries and Illness: The Role of Economic Incentives*. Working paper 5. National Research Centre for Occupational Health and Safety Regulation, Australian National University.

Collins, R. (2013) *Losing faith in lost time injuries.* Inside Safety, March. Aspermont

http://issuu.com/aspermont/docs/ism_1303_au_-_entire_mag [17/2/2015 10:45:07 AM]

Cooper, M. D. (2000). Towards a model of safety culture. Safety Science, **36:** 111-136.

Conchie, S.M, Taylor, P.J. & Charlton, A. (2011). *Trust and distrust in safety leadership: Mirror reflections?* Safety Science, **49**: 1208–1214.

Cox, S. & R. Flin (1998). *Safety culture: Philosopher's stone or man of straw?* Work and Stress **12**(3): 189-201. Cited in Borys, D. (2014). Organisational Culture. OHS Body of Knowledge. Safety Institute of Australia. Tullamarine, Victoria.

Dekker, S. (2006). *Resilience engineering: Chronicling the emergence of confused consensus*. In E. Hollnagel, D. Woods and N. Leveson (Eds.), Resilience engineering: Concepts and precepts. Hampshire: Ashgate.

Denison, D. R. (1996). *What is the difference between organizational culture and organisational climate? A native's point of view on a decade of paradigm wars*. Academy of Management Review, **21**(3): 619-654.

Fernández-Muniz, B, Montes-Peón, J.M & Vázquez-Ordás, C.J. (2012). *Safety climate in OHSAS 18001-certified organisations: Antecedents and consequences of safety behaviour* Accident Analysis and Prevention, **45**: 745– 758.

Ferreira, A. & Otley, D. (2009). *The design and use of performance management systems: An extended framework for analysis.* Management Accounting Research, 20**,** 263-282.

Flin, R., Mearns, K., O'Connor, P. & Bryden, R. (2000). *Measuring safety climate: identifying the common features*. Safety Science **34**: 177-192.

Glendon, A. I., Clarke, S. G. & McKenna, E. F. 2006. Human Safety and Risk Management, (2nd ed.) FL, Boca Raton.

Glick, W. H. (1985). *Conceptualising and measuring organizational and psychological climate: pitfalls of multi-level research*. Academy of Management Review **10**(3): 601-610.

Goh, Y. M, Brown,H. & Spickett, J (2010). *Applying systems thinking concepts in the analysis of major incidents and safety culture*. Safety Science, **48**: 302–309.

Grote, G. & Kuenzler, C. (2000). *Diagnosis of safety culture in safety management audits.* Safety Science, **34**: 131-150.

Grote, G. (2008). *Diagnosis of safety culture: A replication and extension towards assessing ''safe" organizational change processes.* Safety Science, **46**: 450–460.

Guldenmund, F.W, (2000). *The nature of safety culture: a review of theory and research.* Safety Science, **34**: 215 – 257.

Gunningham, N, Sinclair, D. (2011) *Culture Eats Systems for Breakfast': On the Limitations of Management-Based Regulation.* Working paper 83. National Research Centre for OHS Regulation, The Australian National University, Canberra.

Hale, A. (2000). *Editorial: Culture's confusions*. Safety Science **34**(1): 1-14.

Hale, A. R. & J. Hovden (1998). *Management and Culture: The Third Age of Safety*. A Review of Approaches to Organizational Aspects of Safety, Health and Management Occupational Injury: Risk Prevention and Intervention. A. M. Feyer and A. Wiliamson. London, Taylor and Francis.

Harvey, J, Erdos, G, Bolam, H, Cox, M.A. A,, Kennedy, J. N. P, & Gregory, D. T, (2002) *An analysis of safety culture attitudes in a highly regulated environment,* Work & Stress: An International Journal of Work, Health & Organisations, **16(**1): 18-36, DOI: 10.1080/02678370110113226

Health & Safety Executive (2005). *A review of safety culture and safety climate literature for the development of the safety culture inspection toolkit*, Research report 367. *In:* Human Engineering (ed.). UK.

Health & Safety Executive (1993). *ACSNI Study Group on Human Factors,* Third Report. London: HSE Books.

Hollnagel, E. (2014). Safety-I and Safety-II: The past and future of safety management. Surrey, England. Ashgate.

Hopkins, A. (2000). Lessons from Longford: The Esso Gas Plant Explosion. Sydney, CCH Australia Limited.

Hopkins, A. (2002). *Safety Culture, Mindfulness and Safe Behaviour: Converging ideas?* Working paper 7, National Research Centre for OHS Regulation, The Australian National University, Canberra.

Hopkins, A. (2005) Safety Culture and Risk. The Organisational Causes of Disaster. CCH. Australia.

Hopkins, A. (2006). Studying organisational cultures and their effects on safety. *Safety Science,* 44**,** 875-889.

Hopkins, A. (2008). Failure to learn: the BP Texas City Refinery disaster, CCH Australia.

Hopkins, A. (2010). *Dealing With Catastrophic Safety and Environmental Risks: Lessons From the Global Financial Crisis.* Working Paper 79. National Research Centre for OHS Regulation, Australian National University, Canberra. http://www.ohsalert.com.au/nl06_news_print.php?selkey=51235[26/09/2013 8:45:50 PM]

Hopkins, A. & S. Maslen (2015). Risky rewards: how company bonuses affect safety. United Kingdom, Ashgate.

Hudson, P. (2001). Safety culture: The ultimate goal. Flight Safety Australia**,** 29-31.

Hudson, P. (2007). Implementing a safety culture in a major multi-national. Safety Science*,* **45:** 697-722.

Hudson, P, Hudson, T (2013). *Why is Target Zero so hard?* Hudson Global Consulting, the Netherlands.

Hudson, P. (2013). *Understanding your safety culture: Becoming Truly Proactive.* Hudson Global Consulting, the Netherlands.

Hudson, P. (2014a). *Moving up the Cultural Ladder*. Virtual Seminar Series, Safe Work Australia, Canberra. http://www.safeworkaustralia.gov.au/sites/swa/australian-strategy/vss/pages/patrick-hudson-culture-ladder

Hudson, P. (2014b). *Safety Culture and Leadership*. Virtual Seminar Series, Safe Work Australia, Canberra. http://www.safeworkaustralia.gov.au/sites/swa/australian-strategy/vss/pages/patrick-hudson-culture-leadership

INPO. (2013). *Traits of a Healthy Nuclear Safety Culture Addendum I: Behaviors and Actions That Support a Healthy Nuclear Safety Culture, by Organizational Level.* INPO 12–012, Addendum.

Job, J. & Smith, D. (2010). Motivations, Attitudes, Perceptions and Skills: What they said about work health and safety in 2010. Safe Work Australia. Canberra.

Jones, K. (2013). *Is safety leadership the panacea for unsafe workplaces?* SafetyAtWorkBlog. May 6. http://safetyatworkblog.com/2013/05/06/is-safety-leadership-the-panacea-for-unsafe-workplaces/

Jones, K. (2015). *What can we learn from a failure in leadership?* SafetyAtWorkBlog. April 1. http://safetyatworkblog.com/2015/04/01/what-can-we-learn-from-a-failure-in-leadership/

Kontogiannis, T. (2010). *A contemporary view of organizational safety: variability and interactions of organizational processes*. Cognition, Technology and Work*,* **12**:231–249. DOI 10.1007/s10111-009-0131-x

Langfield-Smith, K., Thorne, H. & Hilton R. (2006). Management Accounting: Information for Managing and Creating Value, McGraw-Hill Australia.

Laws, J. (2011). *About those incentives.* The OHS Blog. About Those Bonuses http://ohsonline.com/blogs/the-ohs-wire/2011/04/about-those-bonuses.aspx

Lewin, K., Lippett, R. & White, R.K. (1939). *Patterns of aggressive behaviour in experimentally created 'social climates'*. Journal of Social Psychology **10**(2): 269-299.

Mahoney, L.S. & Thorn, L. (2006). *An Examination of the Structure of Executive Compensation and Corporate Social Responsibility: A Canadian Investigation.* Journal of Business Ethics **69**:149–162. DOI 10.1007/s10551-006-9073-x

Merchant, K. A. & Van der Stede, W. (2012). Management Control Systems: Performance measurement, evaluation and incentives, 3rd Edition. Prentice Hall, New Jersey.

Moran, E.T. & Volkwein, J.F. (1992) *The cultural approach to the formation of organizational climate*, Human Relations, 45: 19-47 cited in Denison, D. R. (1996). "What is the difference between organizational culture and organisational climate? A native's point of view on a decade of paradigm wars." Academy of Management Review, **21**(3): 619-654.

Nahrgang, J.D., Morgeson, F.P., Hofmann, D.A., 2008. Predicting safety performance: a meta-analysis of safety and organizational constructs. In: Zohar, D. (2010). *Thirty years of safety climate research: Reflections and future directions*. Accident Analysis and Prevention, **42**: 1517-1522.

Neal A, Griffin M.A. & Hart P.M, (2000). *The impact of organizational climate on safety climate and individual behaviour*. Safety Science **34**: 99-109

NIOSH. (2002). *The changing organisation of work and the safety and health of Working People.* www.cdc.gov/niosh

NSW Mine Safety Advisory Council. (2009). *A tool to assist sites in reviewing safety incentive schemes during the transition to world-leading OHS in the NSW mining and extractives industry.* Industry and Investment NSW.

O'Neill, S., Martinov-Bennie, N. & Cheung, A. (2013). Issues in the Measurement and Reporting of Work Health and Safety Performance. Safe Work Australia. Canberra. December.

O'Neill, S., McDonald, G & Deegan, C. (2015). *Lost in Translation: Institutionalized Logic and the Problematization of Accounting for Injury.* Accounting, Auditing and Accountability Journal **28**(2): 180-209.

O'Neill, S. & K. Wolfe (2014). *Officers' Due Diligence: Is Work Health and Safety an Accounting Problem?* Journal of Health & Safety Research & Practice **6**(1): 15-21.

O'Neill, S. & Wolfe, K. *WHS Due Diligence: Guidelines for Evaluating and Reporting on Safe and Healthy Work (unpublished)*

OHS Alert (2013) *Workers concealed incident to protect safety bonus.* http://www.ohsalert.com.au/nl06_news_print.php?selkey=51192 [26/09/2013 8:54:44 PM]

OHS Alert (2013). *Early-finish project bonuses can undermine safety.*

Olson, R. & Austin, J. (2001) *Behavior-Based Safety and Working Alone*, Journal of Organizational Behavior Management, **21**(3): 5-43. DOI:10.1300/J075v21n03_02

Otley, D. (1999). *Performance management: A framework for management control systems research*. Management Accounting Research, 10**,** 363-382.

Parker, D., Lawrie, M. & Hudson, P. 2006. *A framework for understanding the development of organisational safety culture*. Safety Science, **44**: 551-562.

Parsons, H.M. (1974) *What happened at Hawthorne?* Science, **183**(4128):922-932

Paterson, A. (2012). *Interview on Safety culture (unpublished).*

Peter Wagner & Associates. (2010). Safety – A Wicked Problem Leading CEOs discuss their views on OHS transformation. www.peterwagner.com.au

Peterson, M. W. & M. G. Spencer (1990). *Understanding academic culture and climate*. New Directions for Institutional Research, **68**: 3-18.

Petzall, S.B, Selvarajah, C.T. & Willis, Q.F. (1993). Management a Behavioural Approach. Longman Cheshire. Melbourne.

Pidgeon, N. (1998). *Safety culture: Key theoretical ideas.* Work and Stress **12**(3): 202-216.

Pidgeon, N. (1991). *Safety culture and risk management in organisations*. Journal of Crosscultural Psychology **22**(1): 129-140.

Price Waterhouse Coopers (2007). *Executive Remuneration: simple. Practical proposals for better practice in reporting executive reward.* www.reportleadership.com

Rankin. A., Lundberg, J. Woltjer, R. Rollenhagen, C. & Hollnagel, E. (2015). *Resilience in everyday operations: A framework for analyzing adaptations in high-risk work*, Journal of Cognitive Engineering & Decision Making, 8(1):78-97.

Reason, J. (1997). *Managing the Risks of Organisational Accidents,* Ashgate, Hants, Aldershot Publishing Ltd.

Reason, J. (2012). *My Life.* Notes from talk – Norton Rose Fulbright

Reber, A.S. (1985). *Dictionary of Psychology.* Penguin. Great Britain.

Rentsch, J. R. (1990). *Climate and Culture: Interaction and qualitative differences in organizational meaning*. Journal of Applied Psychology, **75**(6): 668-681.

Roberts, A, Kelsey, J, Smyth, H. & Wilson, A. (2012). *Health and safety maturity in project business cultures.* International Journal of Managing Projects in Business, **5**(4): 776-803.

Safe Work Australia (2012). Guide to the Model Work Health and Safety Act. Canberra. October,

Scarlett, B. C. & Wilks, C. 2003. Management Accounting - Performance Management, MA, CIMA Publishing, Oxford.

Schein, E. H. (1992). Organizational culture and leadership. San Francisco, Jossey-Bass.

Schneider, B., Breif, A.P. & Guzzo, R.A. (1996). *Creating a climate and culture for sustainable organizational change*. Organizational Dynamics, **24**(4): 7-19.

Schneider, B., Ehrhart, M. G. & Macey, W. H. (2013). *Organizational Climate and Culture*. Annual Review of Psychology, **64**: 361-388.

Shaw Idea. (2007). Digging Deeper. NSW Dept of Primary Industries.

Shaw, J.D, Gupta, N. & Delery, J.E. (2002). *Pay dispersion and workforce performance: Moderating effects of incentives and interdependence.* Strategic Management Journal; Jun 2002; **23**(6): 491.

Sherrif, B. & M. Tooma (2010). Understanding the Model Work Health and Safety Act. North Ryde, CCH Australia Ltd.

Silva, S.A, Fugas, C.S. & Melia, J.L. (2011). *The "Is" and the "Ought": How Do Perceived Social Norms Influence Safety Behaviors at Work?* Journal of Occupational Health Psychology, **16**(1): 67–79.

Sparer, E. (2012). *A new Take on Safety incentive programs.* http://www.predictivesolutions.com/safetycary/a-new-take-on-safety-incentive-programs/?goback=%2Egde_3776681_member_196896486 [18/12/2012 10:13:59 AM]

Sparer, E.H. & Dennerlein, J.T. (2013) *Determining safety inspection thresholds for employee incentives programs on construction sites*. Safety Science, **51**: 77–84.

Swuste,P, Frijters A. & Guldenmund, F (2012) *Is it possible to influence safety in the building sector? A literature review extending from 1980 until the present.* Safety Science, **50**: 1333–1343.

Tooma, M. (2012a). Due Diligence: Duty of Officers. North Ryde, CCH Australia Limited.

Tooma, M. (2012b). Due Diligence: Horizontal and Vertical Consultation, North Ryde, CCH Australia Limited.

Torner, M. (2011). *The 'social-physiology' of safety. An integrative approach to understanding organisational psychological mechanisms behind safety performance*. Safety Science, **49**: 1262-1269.

Ukko, J., Tenhunen, J. & Rantanen, H. (2007). *Performance measurement impacts in management and leadership: Perspectives of management and employees*. International Journal of Production Economics, **110:** 39-51.

US Dept of Labor. (2012). *Employer Safety Incentive and Disincentive Policies and Practices.* http://www.osha.gov/as/opa/whistleblowermemo.html[26/05/2012 12:54:00 PM]

Van Vuuren, W. *(*2000). *Cultural influences on risks and risk management: six case studies,* Safety Science, **34**: 31-45.

Verbeke, W., Volgering, M. & M. Hessels (1998). *Exploring the conceptual expansion within the field of organizational behaviour: organizational climate and organizational culture*. Journal of Management Studies, **35**(3): 303-329.

Westrum, R. (1993) Cultures with requisite imagination, cited in Parker, D., Lawrie, M. & Hudson, P. 2006. *A framework for understanding the development of organisational safety culture*. Safety Science, **44**: 551-562.

Workplace OHS. (2013). *Incentives.* http://www.workplaceohs.com.au/workplace-culture/incentives/.

Wran Consultancy Project (2007). Digging Deeper: Executive Summary. Commissioned by NSW Mine Safety Advisory Council (ed.). NSW Department of Primary Industries.

Zakaria, I. (2012*). Performance measures, benchmarks and targets in executive remuneration contracts of UK firms*. The British Accounting Review, **44**: 189–203.

Zohar, D. (2010). *Thirty years of safety climate research: Reflections and future directions*. Accident Analysis and Prevention, **42**: 1517-1522.

Zohar, D. and Luria G. (2005). *A multilevel model of safety climate: cross-level relationships between organization and group-level climates*. Journal of Applied Psychology, **90**(4): 616-28.

Zwetsloot, G.I.J.M, Hale, A. & Zwanikken, S. (2011*). Regulatory risk control through mandatory occupational safety and health (OSH) certification and testing regimes.* Safety Science, **49**: 995–1006.