national research centre for
OHS regulation

RegNet

Working Paper 31

Best Practice Rail Safety Regulation

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December 2004

ANU
THE AUSTRALIAN NATIONAL UNIVERSITY

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- produce regular reports on national and international developments in OHS regulation;
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1. Introduction

Regulating rail safety, and in particular, achieving regulatory best practice, is no easy task. The disaggregation and privatisation of the rail system, and the broader industry restructuring that took place in the 1990s have produced an industry that is structurally diverse, characterised by technological and corporate complexity and subject to competitive pressures as never before.[1] Moreover, the multiplicity of different rail organisations that has emerged from this process – ranging from large, sophisticated commercial operators through to small heritage railways[2] - has resulted in considerable variation in available resources, skills, experience and understanding, and in safety performance itself.[3]

There is much evidence to suggest that there are serious deficiencies both in the rail industry's approach to safety and in the regulatory response to it, although the nature of these deficiencies varies considerably from State to State. In New South Wales, the Glenbrook and Waterfall accidents highlighted a series of major problems that (according to Hopkins analysis of the Glenbrook enquiry) include: a rule focussed culture [which] tended to deaden awareness of risks; the organisational and occupational fragmentation of the railway system; a powerful culture of punctuality - of 'on time running' - whose side effect was to undermine safety; a railway culture that was profoundly risk blind, even risk denying; and a rail culture that disempowered its employees.[4]

Victoria too, although it has not experienced the same sorts of high profile accidents as New South Wales, nevertheless confronts safety and regulatory problems of considerable magnitude. For example, in 2004 a Department of Infrastructure report documented the absence of any sustained improvement in rail incident trends and a number of serious rail incidents that have exposed deep deficiencies in the current regulatory system.[5] According to the Report, the latter include: the absence of any clear definition of the respective responsibilities of the industry and the Safety Regulator; no explicit obligation to demonstrate that a Safety Management System (SMS) is capable of systematically and continually controlling and minimising the risks that have been identified and assessed by a rail organisation; inadequate specification within the SMS and no mandated performance standard for its scope or quality; a lack of penalties for disregarding non-conformance or non-compliance reports, and a lack of guidance for industry and the regulator for the conduct of safety investigations.[6] The limitations of safety arrangements in other jurisdictions are less well documented but there is reason to believe that they are also, for the most part, substantial.

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[1] Department of Infrastructure, Victoria. (2004). <u>Improving Rail Safety in Victoria: Issues Paper for a Review of the Rail Safety Regulatory Framework.</u> pp.1,14.

[2] Ibid. p.14.

[3] As of 2004 in Victoria there were three accredited track managers and 54 accredited rail operators. "Victorian rail organisations now utilise a range of different safety standards. Safety performance is also variable", in Ibid.

[4] Hopkins, A. (1995). <u>Making Safety Work: Getting management commitment to occupational health and safety.</u> Allen & Unwin Publishers, Sydney.

[5] Department of Infrastructure, above n1, 15.

[6] Ibid. p.19.

More broadly, it is doubtful whether either the industry or government has come to terms with the implications of privatisation or the shift from "largely Government owned entities, which often combined the roles of policy maker, regulator and service deliverer … [to] privatised or corporatised entities [which] have to some extent separated these roles".[7] Nor have effective measures been taken to re-create a safety culture within the industry, notwithstanding that the disaggregation of the rail system in the 1990s was "largely responsible for the destruction of the previously existing safety culture, which was 'fundamental' to maintaining optimal safety".[8] Couple all this with the industry's inherent vulnerability to high severity albeit low probability, accidents, and the extent of the regulatory challenge, is easy to grasp.

That challenge involves essentially three issues: (i) what sort of standards should be imposed upon rail enterprises; (ii) what role(s) should the regulator take with regard to enforcement; and (iii) what roles should there be for workers and third parties. We address these issues in the following sections, with a particular focus on the first two questions, which in the context of the contemporary rail industry in Australia are both controversial and crucial to its future safety performance. In doing so, we assume the goals of rail safety regulation to include (as specified by the National Transport Commission[9]): public trust; the safety of rail users, the general public and rail employees; the need to balance safety and efficiency; and to deliver regulatory oversight at lowest possible cost, to which we would add continuous improvement and best industry practice.

This article is a synthesis. It draws on the author's own work on occupational health, major hazard facilities and environment regulation, on that of colleagues at Regulatory Institutions Network at Australian National University most notably, Elizabeth Bluff, Andrew Hopkins and Christine Parker, and on recent reports on rail safety regulation,[10] in seeking to develop a framework for best practice rail safety regulation.[11]

2. Designing Standards: Prescriptive, Performance and Systems Based Approaches

When designing safety standards, it is vitally important to determine what types of standards should be adopted. For example, what kinds of measures are most likely to achieve best policy outcomes? What techniques are most likely to be flexible, produce safety and health benefits at an acceptable cost, provide practical guidance to employers and others and be easy to enforce? Decisions about these issues will have major implications not only for regulators, duty holders and potential victims of rail-related injury, but also for the overall effectiveness of the regulatory regime.

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[7] National Transport Commission in association with Jaguar Consulting Pty Ltd. (2004). Improving the Regulatory framework for Rail Safety in Australia. Issues Paper. p 15.

[8] Hopkins, A. (forthcoming). Safety, Culture and Risk. CCH, Sydney.

[9] National Transport Commission, above n7, 10-11.

[10] Most notably Ibid and Department of Infrastructure, above n1.

[11] It does not purport to deal with further issues arising from the division between control/ownership of track and train operators.

Until quite recently, there were essentially two types of standards that were applied to safety issues: prescriptive (also called specification) standards and performance standards (which we refer to chronologically as phase one and phase two standards). A prescriptive/specification standard is a standard which tells the duty holder precisely what measures to take, and which requires little interpretation on their part (for example, 'stop at the red light'). Such a standard is defined in terms of the specific types of safeguarding methods that must be used in a specific situation and in terms of its emphasis on the design and construction of these safeguards.[12] In contrast, a performance standard is one which specifies the outcome of the OHS improvement, but which leaves the concrete measures to achieve this end open for the employer to adapt to varying local circumstances (for example, have the capacity to stop within 500 metres).

Defined broadly, performance standards also incorporate the sort of general duties that were introduced into occupational health and safety regulation (but not rail safety regulation) in the 1980s as a direct consequence of the 1972 Robens' Report.[13] These include an obligation to ensure health and safety so far as reasonably practicable, which is further broken down into a number of sub-categories such as including to provide and maintain plant and systems of work, safe handling storage and transport, provision of information, instruction, training and supervision, and to maintain premises in safe condition.

Although prescriptive and performance standards have made considerable contributions to improving safety in the past,[14] both approaches have a substantial limitation: namely they only require enterprises to achieve minimum standards and provide no incentives or encouragement to go beyond those minima. They do not encourage continuous improvement or industry best practice. Nor do they directly encourage enterprises to develop a safety culture or to "build in" safety considerations at every stage of the production process. A specification standard, for example, may prescribe a specific way of utilising a particular method or technology. But once that has been done there is no requirement or even encouragement to go further to devise methods that might achieve far higher levels of safety. Similarly, performance standards prescribe particular outcomes but do not imply that further improvements are necessary, once that outcome has been achieved.

Certainly for some enterprises, particularly those with little expertise, sophistication or commitment to safety (for example, small enterprises, such as heritage railways), it may not be realistic at least in the short term, to expect compliance with anything more than the legal minima. Even bringing them up to this standard may be a considerable achievement. Performance and specification standards both continue to make a substantial contribution in this regard.

However, there are many other enterprises which, potentially at least, could achieve far more than those minima. An important role of law is to encourage them to do so. Yet not only do phase one and phase two standards fail to achieve this goal but there is some evidence that they may even discourage efforts to go beyond compliance with existing minimum standards. For example,

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[12] McAvoy, PW. (1977). OSHA Safety Regulation: Report of the Presidential Task Force. American Enterprise Institute, Washington DC.

[13] Robens Committee (Committee on Safety and Health at Work). (1972). Report of the Committee on Health and Safety at Work 1970-1972. HMSO, London, p 7.

[14] See Gunningham, N. (1996). "From Compliance to Best Practice in OHS: The roles of specification, performance and systems-based standards." Australian Journal of Journal of Labour Law 9(3) pp. 221-246.

Hopkins, in his analysis of the Glenbrook accident, found that heavy reliance upon prescriptive rules (eight volumes of them) as a means of managing risk was counterproductive in that it discouraged workers from taking responsibility, served as a mechanism for allocating blame, and generated a general sense of disempowerment which in turn engendered a sense of fatalism about accidents.[15]

By the mid 1990s a third phase of regulation could be identified, based on the development of safety management systems. A systems approach involves managing safety or any other problem, in terms of systems of work rather than concentrating on individual deficiencies. That is, it involves the assessment and control of risks and the creation of an inbuilt system of maintenance and review. Its focus is on the organisational structure, responsibilities, practices, procedures, processes and resources for implementing and maintaining safety management. Of particular importance will be the setting of objects and targets, the establishment of a management program, procedures for achieving the targets, and measurement techniques to ensure that they are reached.

Such an approach encourages enterprises to go beyond compliance with minimum standards through a combination of systematic management practice and high level commitment to a safety culture. It also involves both management and workers in the development and maintenance of the system and integrates within it, continuous measurement, benchmarking, the capacity for system self-correction and the commitment to continuous improvement. In effect, this approach is a direct application of the Robens Report's exhortation that regulation should be "...predominantly concerned not with the detailed prescriptions for innumerable day to day circumstances but with influencing attitudes and with creating a framework for better safety and health organisation by industry itself."[16] If successful, as demonstrated below, a safety management system (SMS) will achieve far more through co-operation, through changing the norms of the business community, and through developing a safety culture, than any of its predecessors have achieved through other means.

However, it must be emphasized that the different types of standard analysed above, are not mutually exclusive, and prescriptive, performance and systems based standards can all make valuable contributions to improved safety performance. For example, notwithstanding the serious criticisms made of prescriptive standards in terms of their lack of flexibility and unintended consequences, it would be almost inconceivable to do away with them entirely. Thus many industry insiders who gave evidence to the Glenbrook enquiry, while criticizing the sheer volume of rules and their opaqueness, nevertheless conceded that rules still had their place, perhaps "not [for] every action to be taken in every situation, but [regarding] the kind of decisions which must be taken and the information to be considered"[17] or as part of a hierarchy of controls, or as articulating a number of fundamental principles. And while general duties are too broad and vague to form the basis of safety regulation in isolation, they have value in articulating a set of general principles and can both complement a systems based approach and be tied to codes of practice that provide the greater specificity demanded by small organisations.[18]

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[15] Hopkins, above n8.

[16] Robens Committee, above n13, 7.

[17] Hopkins, above n8.

[18] See generally Gunningham N. and Johnstone R. (1999). Regulating Workplace Safety: Systems and Sanctions. Oxford University Press, Oxford, UK, Ch 2.

Thus far more is likely to be achieved by using judicious combinations of policy standards, than by adopting single standard approaches. By doing so, the weaknesses of any given approach may be compensated for by building in the strengths of another standard type. However, this is not to suggest that all standard types should be used extensively in all situations. On the contrary, such an approach would result in regulatory overload and for that reason would be counter-productive. *The challenge for policymakers is to adopt the most appropriate mix of approaches, for any given set of circumstances.* As applied to rail safety, we address this question primarily in relation to large commercial operators, while noting that a very different approach should be applied to heritage railways and other small and relatively unsophisticated operators (an issue to which we return in Part 4).

3. Standards for Large Commercial Operators

As indicated earlier, large commercial operators are technologically and organisationally complex, and since privatisation, subject to substantial commercial pressures which can sometimes conflict with the public interest. For example, in the Glenbrook enquiry, Hopkins describes in some detail how a powerful culture of punctuality undermined safety.[19] Moreover, safety in the rail industry, at least where it involves operators responsible for large numbers of trains and complex interactions, presents technical, logistical and administrative challenges that cannot appropriately be dealt with by prescriptive regulation – as also amply documented in the Glenbrook enquiry.[20] The regulatory challenge is exacerbated by the imbalance of knowledge between government and the rail industry, with the latter being far more capable of identifying the risks, and of managing them, than the regulators.

How should regulators best deal with these types of operators? Christine Parker, in her book, *The Open Corporation*, argues that effective regulation involves three components: (i) the commitment to respond; (ii) The acquisition of specialized skills and knowledge; and (iii) the institutionalisation of purpose.[21] This is a useful framework within which to think about rail regulation. In sections 3.1-3.3, we describe these three components and their applicability to rail safety in broad terms. In section 3.4 we provide a much more detailed analysis of how a requirement on rail operators to introduce Safety Management Systems in conjunction with a Safety Case, might achieve the aims of the second and third of these components and in doing so best achieve the overall objectives of rail safety regulation.

3.1 The commitment to respond

It might be argued that large commercial rail organisations have an enlightened self-interest in maintaining a high standard of rail safety. After all, the consequences of a major disaster in particular, involve not only the horror of multiple deaths, but also incur substantial financial and reputation costs on the relevant operator. Yet there is a considerable history of serious rail disasters, many of them preventable and resulting from serious flaws in safety arrangements that

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[19] Hopkins, above n8.

[20] McInerney, PA. (Acting Justice). (2001). <u>Special Commission of Inquiry Into The Glenbrook Rail Incident.</u>

[21] Parker, C. (2002). <u>The Open Corporation: Effective Self-regulation and Democracy.</u> Cambridge University Press, Cambridge, UK.

suggest it is not sensible to rely on either self-interest or self-regulation alone. On the contrary, corporate decision-makers commonly behave in ways that suggest that they are "boundedly rational"[22] and in consequence focus on core business functions and ignore lesser costs, even though these costs could be reduced through improved safety precautions.

Against this backdrop, how might regulators generate the internal commitment not only to respond to safety issues, but the sort of re-thinking at senior level necessary to induce the development of effective internal responsibility and self-regulation?

One means to overcome bounded rationality and to generate a 'crisis of conscience' within the enterprise would be for the regulator to take effective enforcement action, commensurate with the responsiveness of the enterprise to the directives of the regulator, and the severity of the breach. This would involve escalating up an "enforcement pyramid" from advice and persuasion through administrative measures to criminal sanctions and ultimately to the suspension or removal of accreditation.[23] In this way the regulator would bring safety into focus in such a way as to overcome bounded rationality, or various forms of resistance within the organisation and its culture. However, at present, there is a serious gap in the enforcement pyramid, at least in some jurisdictions, between less interventionist strategies such as improvement and prohibition notices and on the spot fines (towards the bottom of the pyramid) and the 'nuclear deterrent' of removal or suspension of accreditation (which all parties know to be so serious a sanction that it is highly unlikely to be invoked), at the top.

This gap might best be address by making a variety of restorative justice strategies available in the event of serious safety lapses "to give the offender a chance to proactively put things right".[24] That is, rather than focusing on deterrence or retribution (which often inhibit investigations into the causes of accidents by discouraging witnesses from being forthcoming) a more constructive solution will often be to invoke mechanisms that require the offender to put in place systems that will prevent a recurrence of similar behaviour in the future. For example, an enterprise found to be in serious breach might be required to introduce a Safety Improvement Plan (modelled on the concept of an Environmental Improvement Plan[25]). This is a public commitment by a company to enhance its safety performance, outlining areas of a company's operations to be improved and negotiated in conjunction with the regulator and other stakeholders impacted upon by the previous transgression. It would contain clear timelines for completion of improvements and

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[22] Corporate behaviour with regard to many of these disasters (and other incidents) is more consistent with bounded rationality, which assumes not that people are irrational (although they sometimes are) but rather that they have neither the knowledge nor the powers of calculation to allow them "to achieve the high level of optimal adaptation of means to ends that is posited by economics" in Simon, H. (1992). Economics, Bounded Rationality and the Cognitive Revolution. Edward Elgar, UK, p3. Two factors which undermine rationality are not knowing in advance the desired outcome, and not knowing how to achieve the desired outcome even when it is known in advance. Given these constraints on rational behaviour, there is an important role for government in providing incentives for firms to go beyond compliance.

[23] For a fuller analysis of regulatory strategy on this model, see Gunningham and Johnstone, above n18, Chs 5 & 6. The concept of the enforcement pyramid is taken from Ayres, I. and Braithwaite, J. (1992) Responsive Regulation : Transcending the Deregulation Debate. Oxford University Press, New York.

[24] Parker, above n21, 253.

[25] See Gunningham, N. & Sinclair, D. (2002), Leaders and Laggards: Next Generation Environmental Regulation, Greenleaf, UK, Ch 8.

details about on-going monitoring of the plan. Improvements could include new works or equipment, or changes in operating practices. Monitoring, assessments and audits would be undertaken to plan and support these improvements.

A number of other mechanisms might be invoked to motivate senior management directly. This will be particularly important, given the considerable evidence that senior management commitment (or the lack of it) is a crucial variable in influencing an enterprise's overall safety performance.[26] Mechanisms for achieving this end have been examined in a previous report, and include imposing personal liability on senior officers, and a combination of positive and negative incentives including publicising compliance records and publicity orders.[27] Another approach, which has proven effective in the area of environmental regulation, is to require that the enterprise CEO personally sign off on key regulatory safety commitments, thus generating a sense of personal responsibility, and an inclination to take a greater interest in how those commitments are discharged at lower levels in the organisation.

Another and complementary approach would be to provide the public with access to information about the relative safety performance of different rail operators. If this were tied to credible performance indicators such as to enable the creation of a "league table" then it might prove a highly effective motivator of improved safety performance – just as the Toxic Release Inventory in the United States galvanised a number of major companies to substantially improve their environmental performance.[28] Publicly accessible industry benchmarking might also serve to ratchet up poorer safety performers to the level of the best operators through a combination of modelling and external pressure. Various other forms of adverse publicity, as advocated by Fisse and Braithwaite and others,[29] might also prove effective in shaming corporations into improving their safety performance, particularly if coupled with industry benchmarking.

3.2 Acquiring specialized skills and knowledge: the right standards mix

On a traditional approach, that the best way to bring a commercial enterprise up to a minimum acceptable safety performance is assumed to be through a prescriptive and perhaps performance-based rules regime. Yet a substantial body of literature now recognises that the capacity of the state to deal with complex organisations and complex safety problems through rules alone is very limited. As argued above there is a limit to the extent to which it is possible to add more and more specific prescriptions without this resulting in counterproductive regulatory over-load. The trained incapacity of workers and others to see beyond the rules was a major cause of the Glenbrook disaster, where it was blamed for deadening an awareness of risks. Rather than fostering safety, the eight volumes of rules did much to constrain it.[30] Similarly, one cause to the Three Mile Island nuclear accident and near melt-down in the United States was that operators

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[26] Gunningham, N. (1999). <u>CEO and Supervisor Drivers: Review of Literature and Current Practice</u>, National Occupational Health and Safety Commission (NOHSC).

[27] Ibid.

[28] See Gunningham and Sinclair, above n25, Ch 6.

[29] Fisse, B., and Braithwaite, J. (1993). <u>Corporations, Crime and Accountability.</u> Cambridge University Press, Cambridge, UK; Braithwaite, J. (1985). <u>To Punish or Persuade: Enforcement of Coal Mine Safety.</u> State University of New York Press, Albany.

[30] Hopkins, above n8.

simply followed rules, without any capacity for strategic thinking, and as events unfolded which were not covered by a rule, they had no capacity to read the situation and respond appropriately.[31]

In contrast, many contemporary regulatory theorists and policy analysts would argue that a primary role of regulation is to induce companies themselves to acquire the specialised skills and knowledge to regulate themselves (subject as we will see, to State and third party oversight). This argument is most clearly articulated in Christine Parker's book, *The Open Corporation,* but it resonates with the experience and frameworks developed by a number of other scholars over the last decade or so. Many of the latter point to the limitations of direct, rule-based regulation, and to the fact that: "most accidents are not simply due to the failure of technical measures, but usually involve an organisational or management failure".[32] They go on to argue that what is needed is a form of regulation, or co-regulation, directed consciously and systemically to managerial levels[33] and which encourages and facilitates greater 'reflexivity' on the part of the organisation as a whole.

Put differently, these theorists argue for a *procedure* oriented approach rather than a prescriptive one, and seek to encourage companies not only to design their own self-regulatory processes but also "to engage in self-evaluation of those processes as an integral part of their broader regulatory requirements".[34] In section 3.4 below, we explore in more concrete ways how a safety management systems approach, coupled with effective risk management through a Safety Case could best achieve this form of corporate self-evaluation, enable internal capacity building within individual commercial rail operators, and not only prevent, (and identify and respond to) breaches of laws, but also promote a culture of compliance.

3.3 Institutionalising Purpose: the Role of the Regulator

There is an overwhelming weight of evidence to suggest that procedure based approaches, which rely on self-regulation *alone*, are only in the most exceptional circumstances, capable of protecting the public interest.[35] Rail safety is certainly not one of these exceptions. In the case of

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[31] For an excellent analysis of the alternative and much more reflexive regime that evolved in the aftermath of Three-Mile Island see Rees, JV. (1994). Hostages of Each Other: The Transformation of Nuclear Safety Since Three Mile Island. University of Chicago Press, Chicago.

[32] Mitchison, N. (1999). "The Seveso II Directive: Guidance and fine tuning." Journal of Hazardous Materials 65(1-2), 23-36, p.32.

[33] For example, proponents of reflexive regulation (Teubner, G. (1983). "Substantive and Reflexive Elements in Modern Law." Law and Society Review 17: 239; and Teubner, G., Farmer, L. & Murphy, D. (eds). (1994). Environmental Law and Ecological Responsibility: The Concept and Practice of Ecological Self-organisation. Chichester, UK) which uses *indirect* means to achieve broad social goals, argue that this approach has a much greater capacity to come to terms with increasingly complex social arrangements. This is because it: "focuses on enhancing the self-referential capacities of social systems and institutions outside the legal system, rather than direct intervention of the legal system itself through its agencies, highly detailed statutes, or delegation of great powers to the courts … [it] aims to establish self-reflective processes within businesses to encourage creative, critical, and continual thinking about how to minimize … harms and maximize … benefits" in Orts, W.E. (1995). "Reflexive Environmental Law." Northwestern University Law Revue 89(4) 1232.

[34] Parker, C. above n21, 283.

[35] Gunningham, N., and Rees, J. (1997). "Industry Self-Regulation: An Institutional Perspective." Law and Policy. 19(4), 363-414.

commercial rail operators, the industry's self-interest in commercial outcomes (not least, profitability and on-time running) demonstrably conflicts with safety considerations, at least in some contexts,[36] while in others it may simply be that, whether as a result of bounded rationality or for other reasons, safety is not given a sufficiently high priority within the organisation.[37]

For these reasons, it is only if the self-regulation and risk-management of the industry is closely scrutinised by government with the threat of more direct intervention if it fails, that an enterprise is likely to take effective action. On this model, what is needed is a form of "meta risk management" or "meta-regulation" whereby government (or a third party) rather than regulating directly, risk-manages the risk management of individual enterprises.[38] Put differently, government engages in independent risk assessment on the basis of information supplied by the companies. As Parker argues, the role of legal and regulatory strategies under this approach is to add the 'triple loop' that "forces companies to evaluate and report on their own self-regulation strategies so that regulatory agencies can determine the ultimate objectives of regulation are being met".[39]

In effect, meta regulation is the approach applied under the Safety Case regime, instituted on North Sea oil rigs following the Cullen enquiry into the Piper Alpha disaster where 167 lives were lost.[40] This involves a safety management system coupled with in an in-depth risk assessment through the mechanism of a Safety Case. The latter is developed by the rig operator and submitted to the regulator for scrutiny and approval. Similarly, the safety regime established for the nuclear power industry, post Three-Mile Island, ceased to be primarily about government inspectors checking compliance with rules, and more about encouraging the industry to put in place safety management systems which were then scrutinised by regulators, and in this case, by the industry association in the form of the Institute of Nuclear Power Operations.[41] This shift of emphasis is also evident in a number of other initiatives, the most far reaching of which are in the UK and the EU with regard to Major Hazard Facilities under the Seveso II Directive which requires the provision by the facility (and assessment by the government regulator) of comprehensive installation safety reports[42].

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[36] Hopkins, above n8.

[37] Again this was demonstrably the case in the Glenbrook accident. See Ibid.

[38] This concept is further developed by Parker, above n21; and Braithwaite, J. and Williams, R. (2001) Meta Risk Management and Tax System Integrity. Working Paper 23, Centre for Tax System Integrity, Canberra.

[39] Parker, above n21, 255.

[40] See Box 1 below.

[41] Braithwaite, J. and Drahos, P. (2000). Global Business Regulation. Cambridge University Press, New York; and Rees, above n31.

[42] Under The Seveso II Directive all operators of establishments coming under the scope of the Directive need to send a notification to the competent authority and to establish a MAPP. Upper tier establishments are also required to provide a Safety Report to the Competent Authority, a SMS and an emergency plan. A SMS should address the issues of: organisation and personnel; identification and evaluation of major-accident hazards; operational control; management of change; planning for emergencies; monitoring performance; and audit and review. To comply with an emergency plan, an operator must provide, in consultation with their personnel, internal emergency plans to the local authorities. In turn the authorities

Box 1: The Cullen Report

Probably the most influential report to deal with regulation of major hazard facilities, was the Cullen Report.[43] This 800 page report followed a 13 month public inquiry into the causes of the Piper Alpha disaster, the world's worst offshore accident, in which 167 oil workers died. The report addressed the need to prevent a repeat of such an event and made specific recommendations as to what type of system of safety management and form of regulation should be introduced. Cullen was particularly influenced by two existing approaches: the onshore safety regime in the UK for major hazard facilities, and the Norwegian offshore model,[44] both of which embraced, explicitly or implicitly, the central value of requiring a Safety Case (see below).

Cullen's central recommendation was the need to introduce a "Formal Safety Assessment" (FSA) which involved: "the identification and assessment of hazards over the whole life cycle of a project" and across all stages from development to decommissioning. Integral to FSA were analytical risk assessment techniques, including hazard and operability studies (HAZOP); quantitative risk assessment; fault tree analysis; human factor analysis; and safety audits.[45] The outcome of a FSA was what became known as a Safety Case: "a systematic documented review of all hazards potentially existing on an installation, and the safety management systems put in place to deal with them."[46]

In Cullen's view, each facility operator should be required by regulation to submit such a case for each of its installations demonstrating that they had evaluated risks and set up a system of management and control to deal with the risks.[47]

A leading part of the Safety Case (in addition to procedural and hardware aspects) was to be the SMS "setting out the safety objectives of the operator, the system by which these objects are to be achieved, the performance standards which are to be met and the means by which the adherence to these standards are to be monitored".[48] Cullen emphasised the need for safe systems arising out of a safety culture supported by senior management and implemented by properly trained workers under the leadership of effective and disciplined management.

are required to draw up external emergency plans in consultation with the public. These plans must be regularly tested in practice, reviewed, revised and updated.

[43] Cullen, Lord (Chairman). (1990). Piper Alpha Inquiry. HMSO, London.

[44] Kaasen, K. (1991) "Post Piper Alpha: Some reflections on offshore safety regimes from a Norwegian perspective." Journal of Energy and Natural Resources Law 9(4), pp 281-289.

[45] Cullen, above n43, Ch 17.13.

[46] Woolfson, C., Foster, J. and Beck, M. (1997). Paying for the Piper: Capital and Labour in Britain's Offshore Oil Industry. Mansell, London, UK, p. 259.

[47] Cullen, above n43, Ch 17.11, 17.12; and Kassen, above n44, 286.

[48] Kaasen, above n44, 281-289.

Importantly, however, Cullen did not regard FSA and the Safety Case as sufficient in themselves as a system of safety management. On the contrary, what was also required was a system of goal-setting regulations as regards issues such as evacuation, escape, rescue, construction and fire and explosion protection.[49] "Goal-Setting" regulations were seen as allowing a greater decision making role for employers and site duty holders in the setting of safety standards. The goals are based on levels of risk which should be "as low as reasonably practicable."

Cullen also called for "the involvement of the workforce" in the reconstruction of offshore safety".[50] Without this "essential ingredient" it has been argued, all the remaining recommendations might be rendered ineffective (in the UK, *see Offshore Installations (Safety Representatives and Safety Committees) Regulations*).[51]

In terms of implementation, Cullen recommended that: (1) The main regulations ... should take the form of requiring that stated objectives are to be met (referred to as "goal setting" regulations) rather than prescribing that detailed measures are to be taken; (2) In relation to goal setting regulations, guidance notes should give non-mandatory advice on one or more methods of achieving such objectives without prescribing any particular method as a minimum or as the measure to be taken in default of an acceptable alternative; and (3) There will be a continuing need for some regulations which prescribe detailed measures. Some of Cullen's recommendations were adopted and implemented in EU Directive 92/91/EEC, while others permeate more specific UK Regulations on OHS (for example, the *Offshore Installations (Safety Case) Regulations*, 1992).

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[49] Cullen, above n43, Ch 17.63.

[50] Ibid. Recommendation 27.

[51] Woolfson (et al), above n46, 270.

3.4 Meta Regulation and Safety Systems in Practice

3.4.1 Nurturing Specialist Skills

At 3.2 above, we argued that, in dealing with technologically and institutionally complex and high risk organisations such as commercial rail operators, the emphasis needs to shift away from a rule-based approach to one which relies heavily upon encouraging companies to design their own self-regulatory *processes* and in particular safety management systems, as a means through which to assess risks, and the organisational structures, responsibilities, practices, procedures, processes and resources to control them.

In principle, such an approach has the considerable attractions of: nurturing and facilitating internal self-organisation and self-regulation; "locking in" a corporate commitment to continuous safety improvement; providing rail operators with the financial benefit which commonly, but not invariably,[52] results from a reduction in safety incidents and in more efficient working practices more generally; providing rail operators with greater flexibility and cost-effectiveness in determining how they achieve regulatory objectives; and enabling regulators to "regulate at a distance", implying a different, and generally more cost-effective, use of regulatory resources. However, these benefits can only be obtained if the system is properly implemented, for superficial or tokenistic attempts to introduce a SMS may well be totally ineffective and even counterproductive. System-based approaches also confront a number of other obstacles which, if not addressed, will seriously undermine their effectiveness.[53]

The challenge for policy design is to take advantage of the very considerable benefits of a systems based approach, while avoiding the pitfalls of implementation failure confronting the unwary. Quite how common those pitfalls might be, and how serious their consequences, is illustrated by a 2004 report by the Victorian Department of Infrastructure.[54] The report documents a number of substantial limitations in the current systems based approach. These include: a lack of clear definition of the respective responsibilities of industry and the Safety Regulator; the lack of any explicit obligation to demonstrate that a SMS is capable of systematically and continually controlling and minimising the risks that have been identified and assessed by the rail organisation; that the requirements of the SMS are stated only in broad terms and there is inadequate guidance regarding the specific nature of the SMS and no mandated performance standard for the scope or quality of the SMS.[55]

Against this backdrop, it will be apparent that only if a systems-based approach is carefully designed and implemented and explicitly includes a number of core elements is it likely to be effective. Bluff and Gunningham, drawing from the various Australian and overseas standards and guidelines on safety management systems, have identified those core elements as follows:

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[52] See also Gunningham, N. (1984). Safeguarding the Worker. Law Book Company, Sydney, Ch 11; and Hopkins, A. "Patterns of Prosecution" in Johnstone, R. (ed) (1994), Occupational Health and Safety Prosecutions in Australia: Overview and Issues. Centre for Employment and Labour Relations Law, The University of Melbourne, Chs 5 & 10.

[53] Wilkinson, A. & Willmott, H. (eds) (1995) Making Quality: Critical New perspectives on Organisational Change. Routledge, London.

[54] Department of Infrastructure, above n1.

[55] Department of Infrastructure, above n1, 19.

management commitment; planning, organising and resourcing of the SMS; designation of responsibility and ensuring accountability; safety policy, procedures and documentation of action taken; risk management involving identification of hazards, assessment and control of risks, evaluation and review of measures implemented; worker participation; development of safety competency of management, supervisors and workers; reporting, investigating and correcting deficiencies; performance monitoring, auditing and review of safety performance; and integration of safety management into other business activities.[56] These and related features are more fully elaborated in Box 2.

<div align="center">

Box 2:
Characteristics of Systematic Safety Management for Positive Safety Performance

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1. Senior management *drives Safety Management Strategy*, playing an active role in planning, resource allocation, hazard management and review of OHSM. This is more than an expression of "commitment" in an OHS policy or OHS activity driven by other personnel. Management commitment is driven by concern about legal consequences, the impact of economic incentives or penalties, moral commitment and concern about reputation.

2. There is a planned and order-seeking approach to safety management, setting measurable goals, well-developed methods of problem solving, securing financial and human resources, designating responsibility for OHS and ensuring that those with responsibility are held accountable.

3. There is a *comprehensive approach to risk management* that involves: (1) identification of all potential sources of harm including those arising from work organisation, psychosocial stressors and ergonomic factors, physical, chemical and biological hazards; (2) using a variety of methods to ensure that hazards are recognised including consultation, analysis of tasks and work roles, review of published sources and analysis of past incidents; (3) a "safe place" approach to prevent or minimise risks by designing out or removing hazards at the source and controlling residual risks by engineering, organisational and procedural means; (4) a "life cycle" approach to risk management that involves identification of hazards and control of risks in procurement, planning and design; in construction or manufacture; in supply and installation; in commissioning, start up and operation; in shutdown, maintenance and cleaning; and in decommissioning or demolition.

4. *Workers are actively involved* and have legal entitlements to perform safety functions, and receive training and information. There is effective dialogue between management and workers on OHS issues, and worker representatives participate in planning, implementation and review of OHSM.

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[56] See Bluff, E., and Gunningham, N. (2003). Principle, Process, Performance or What? New Approaches to OHS Standards Setting. Working Paper 9, National Centre for OHS Regulation. Relevant standards and guidelines include: BSI, 1996; EASHW, 2002; HSE, ILO, 2001; SAA, 1997 & 2002; HSE, Successful Health and Safety Management, HSG 65, Health and Safety Executive, HSE Books, Norwich, 1997; Victorian WorkCover Authority, SafetyMAP: Auditing Health and Safety Management Systems, 4th edition, Victorian WorkCover Authority, Melbourne, 2002; BSI, Guide to Occupational Health and Safety Management Systems, BS 18001, British Standardisation Institution, London, 1999; ILO, Guidelines on Occupational Safety and Health Management Systems, International Labour Office, Geneva, 2001; AS/NZS 4804, Standards Australia, Sydney and Standards New Zealand, Wellington, 1997; SAA, Occupational Health and Safety Management Systems - Specification With Guidance for Use, AS 4801, Standards Australia, Sydney and Standards New Zealand, Wellington, 2001.

5. There is local understanding of safety management and safety "know-how" to support and resource both OHSM and broader safety activities. This includes access to or engaging *OHS specialist* advisory services and *developing OHS competency* amongst managers, supervisors, workers and their representatives, commensurate with their OHS roles.

6. There are arrangements to address safety in the work *of contractors and other contingent workers*, in relation to their own and others' safety. These arrangements are established in partnership with these groups.

7. The organisation *learns from past experience*, investigating incidents and adverse occurrences as a source of insight about weaknesses in safety arrangements and control of specific hazards, and to ensure that these deficiencies are corrected.

8. *Safety policy, procedures and action* taken are documented, the complexity of documentation is minimised, and understanding and ownership of procedures by those required to implement them is maximised. The emphasis is on the quality of OHSM activity actually implemented, not merely on the documentation produced.

9. Safety management is monitored using *positive performance indicators* and *audited*, in order to review and continuously improve OHSM. Audits are conducted by experienced safety auditors and involve a deep, critical and independent examination of everything about an organisation that affects safety, using triangulated data sources.

10. Safety management is *integrated* into the organisation's other management arrangements, distributing tasks and resources for OHSM throughout the organisation.

Source: Modified from Bluff, E.(2003). Systematic Management of Occupational Health and Safety. Working Paper 20. National Centre for Occupational Health and Safety Research.

However, even a systems-based approach applying the above criteria may need to be complemented by "some mechanism to ensure that the enterprise adopts a comprehensive and systematic risk analysis, and then adopt controls and develop a management system based on that analysis".[57] Conventionally, this is achieved by requiring the organisation seeking accreditation, to make a Safety Case to the regulator,[58] by submitting documentary evidence that:

- The safety management system is adequate to ensure compliance with statutory requirements and for the management of all aspects of the adopted major risk control measures;

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[57] Department of Infrastructure, above n1, 48.

[58] Alternately, as the Victorian Department of Infrastructure has pointed out, "A Safety Case approach would be similarly achieved by building more rigorous risk management requirements into the current safety systems approach to accreditation", (in Department of Infrastructure, Victoria. (2004). Towards a Safety Case Approach for Rail Safety: A Summary of Issues. p.3) Under this approach, a rail operator would submit a SMS to the Safety Regulator as currently required, but in addition, " '*prescriptive hard-points'* would be inserted into the otherwise pure objectives-based legislation to accommodate the requirement of a formal risk analysis plus other specific requirements relating to management systems , emergency planning, content of the Safety Case and stakeholder involvement", (in Department of Infrastructure, Victoria. (2004). Towards a Safety Case Approach for Rail Safety: A Summary of Issues. pp.3-4).

- Adequate arrangements have been made for audit of the safety management system, and for audit reporting; and
- That all hazards with the potential to cause a major accident have been identified, the risk systematically evaluated, and measures taken to reduce the risk to people affected by those hazards to as low as reasonably practicable.[59]

The Safety Case regime too, must be carefully designed if it is to achieve its regulatory objectives. For example it is crucial that the two components of the Safety Case and the risk management strategy under the Safety Case are closely linked, and for that linkage to be demonstrated to the Safety Regulator before an organisation is permitted to operate. This linkage, as the Department of Infrastructure points out, is manifestly lacking under the current Victorian accreditation system.[60] Other crucial features identified as necessary to a successful Safety Case and currently lacking are: a rigorous risk assessment; an adequate involvement of key stakeholders (employees, other operators/suppliers, emergency services, community); rigorous development of emergency preparedness; demonstration that risks are acceptable; and adequate review and revision procedures.[61]

Crucial to the success both of the system and the Safety Case, will be the development of appropriate performance measures, for it is these which determine whether safety plans have been implemented and key objectives achieved (significantly, the Cullen Report referred to the centrality of a "goal-setting" regime). Provided such measures are in place then it should be possible for either a third party auditor or the inspectorate to audit the system and the Safety Case effectively. In effect, the agency (or third party) will say "you draw up a plan and we will inspect you against it." The performance and other indicators that will allow this to be done should be determined during the initial baseline audit during which the enterprise and the agency/or third party auditor agree on both performance indicators and benchmarks, and the latter satisfies itself about their adequacy for their purpose. The outcome should be an agreed plan of how the enterprise intends to proceed and how to measure progress against the baseline.

Box 3. How effective are Safety Management Systems and a Safety Case approach?

In broad terms, although there are certainly pitfalls to be avoided in adopting Safety Management Systems, flaws in particular types of systems and a real risk of "implementation failure", there is evidence (albeit fragmented[62]) that, carefully designed, and with top management commitment,

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[59] Minerals Industry Safety and Health Centre. (2001). <u>Development of a Safety Case Methodology for the Minerals Industry: a Discussion Paper</u>. University of Queensland, Brisbane.

[60] Department of Infrastructure, above n1, 33.

[61] Ibid. pp.33-34.

[62] For example, Hale, A., and Hovden, J. (1998). 'Management and Culture: The Third Age of Safety. A Review of Approaches to Organisational Aspects of Safety, Health and Environment.' In Feyer, A-M., anf Williamson, A. (eds) <u>Occupational Injury: Risk, Prevention and Intervention.</u> Taylor and Francis, London, reviewing the broader literature on safety, health and environment management systems, complain of the limited empirical evidence available that links management and organisational characteristics to safety or environmental performance.

systems-based/goal-setting approaches can and do deliver substantial and sustained improvements in safety performance.[63]

When one turns to the evidence concerning the specific value of the Safety Case/safety report approach, this too suggests that this approach has been largely successful, at least as it has been applied to Major Hazard Facilities (although not all the evidence is in one direction[64]). For example, the Norwegians have had considerable success applying such an approach to the safety of North Sea Oil installations.[65]

Consistent with this, a 1999 Australian analysis has concluded that this approach is more effective than the more rule-based US approach because it requires clear demonstration of adequate control, it ensures a comprehensive, seamless, risk-based approach to safety management, and it requires better integration of environmental risks. (DNV, 1999, 7.1). The Royal Commission Report following the Longford accident also views a safety report as: "for some time recognised as one of the most effective means of risk management where reliance is placed on self-regulation".[66]

One report goes so far as to suggest that the introduction of the Safety Case regime in the offshore oil has resulted in a reduction in individual risk of up to 70%,[67] while in the United Kingdom, the

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[63] Industry Commission, Australia. (1995). Work, Health and Safety: Inquiry into Occupational Health and Safety. Volume 1 Report and Volume 2 Appendices, Report No.47, AGPS, Canberra, and references therein; Gallagher, C. (1994). 'Occupational Health and Safety Management', in Belts to Bytes. Conference Proceedings, Work Cover, Adelaide Australia; Gunningham and Johnstone, above n18; and for a more qualified view, see Hale and Hovden, above n62. For example, there is evidence that "the best OHS outcomes are delivered by employers who have enterprise SMSs [which are] based on the principles of total quality management" (Industry Commission, n63, 8). The potential value and importance of a systems-based approach to OHS is also highlighted by John Braithwaite's research on coal mine safety (Braithwaite, above n29). Other research in related areas also acknowledges the importance of a systems-based approach where this is practicable. For example, Perrow suggests that 80-90 percent of the failures relate to the management or organisational system and only 10-20 percent are based on operator error or equipment failure (in Perrow, C. (1984). Normal Accidents: Living With High Risk Technologies. Basic Books, New York). Perrow also cautions that accidents are inevitable in complex, tightly coupled operations (where there is little or no slack or buffer between connected items and "what happens in one directly affects what happens in the other") in Perrow, n63.

[64] (or of both the safety case and broader SMS approach), this is not all in one direction. In particular, it is by no means clear that the safety record of the off-shore oil industry in the UK improved under the post-Piper Alpha (systems and safety case-based) regulatory reconstruction. The industry itself would certainly claim so, but critics, (Woolfson et al, above n47, 385-402), criticize the relevant date as unreliable (Woolfson et al, above n47, 405).

[65] For further information see Saksvik, O., and Nytro, K. (1995a). 'Implementation of Internal Control of Health, Environment and Safety in Norwegian Enterprises', Paper presented to Seventh European Congress on Work and Organisational Psychology, Gyor, Hungary; Saksvik, O., and Nytro, K. (1995b). Implementation of Internal Control of Health, Environment and Safety: An Evaluation and a Model for Implementation. SINTEF IFIM, Institute for Social Research in Industry, Trondheim, Norway.

[66] Dawson, D., and Brooks, B. (1999). Report of the Longford Royal Commission: The Esso Longford Gas Plant Accident. Government Printer for the State of Victoria, Melbourne, para 14.30.

[67] ISR, Introduction to the Safety Case Concept, Industry Science Resources, cited in Minerals Industry Safety and Health Centre, above n59.

Health and Safety Executive was sufficiently convinced of both the success of this approach and of its applicability to rail safety as to propose its use in the rail sector.[68] This decision was implemented in the *Rail (Safety Case) Regulations* 2000**.**

3.4.2 Meta-regulation under a Systems Based Approach

At 3.3 we suggested that self-regulation alone will be insufficient and that what is also needed is a form of "meta risk management" or "meta-regulation" whereby government or a third party rather than regulating directly, risk-manages the risk management of individual enterprises in order to bring about a form of "triple loop" learning.

Such meta regulation might be undertaken either by a third party or by government. On the former approach, oversight of the implementation of a Safety Case would be to require the major hazard facilities operator: (i) to subject their Safety Case to periodic review by an independent third party auditor nominated by the regulatory agency; (ii) that the cost of the audit will be borne by the audited enterprise; (iii) that a summary of the results of the audit be provided to the regulator as well as to the enterprise itself; and (iv) that the regulatory agency shall have access to the full audit report of a small number of third party audits in order to audit the auditors. The details of this approach have been explored previously by Gunningham and Johnstone.[69]

The alternative approach would be for the regulator itself to have responsibility for both accreditation of the Safety Case and periodic audits and inspections of the SMS. This is the approach taken under the large majority of existing Safety Case approaches in other industries (and indeed in the case of the *UK Rail (Safety Case) Regulations 2000*), and it is, we would argue, the preferable course of action in the context of rail safety, given the now widely recognised and well-documented flaws of the alternative course of action: third party audits.[70] However, involving the government regulator in meta-regulation through a SMS and a related Safety Case, clearly requires it to take on very different roles than it does under prescriptive, rules based regulation, or even under a general duties/ performance standards approach.

Under a meta-regulatory approach (and under what, following the Cullen Report is often referred to as a "goal setting" regime) the regulator's role is not to specify the individual action but to oversee the development of the process safety program. In terms of implementation, the problem is that, as one British inspector has pointed out: "enforcement is likely to be more difficult in a goal-setting regime. In a black and white situation, its fairly straightforward - but now if you're in a goal setting regime and they're doing some things, not the way it should be done, there's a lot of judgment involved as to whether its acceptable".[71] Specifically the opportunities for very different styles levels and effectiveness of enforcement in different jurisdictions, is considerable.

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[68] Health and Safety Executive (1998), Railway Safety Case Assessment. HMSO,UK.

[69] Gunningham and Johnstone, above n18, Ch 5.

[70] See Power, M. (2003). "Evaluating the Audit Explosion." Law and Policy, 25(3), pp185-202.

[71] Hall, A. (1995). Regulating Health and Safety Offshore in Britain and Norway. Unpublished, MA Dissertation, Keele University, UK, p. 34.

Under meta-regulation, the role of the inspectorate shifts in emphasis from that of conventional inspection of the premises and plant (which relies heavily on observation of site conditions) to that of audit of the management system. The latter implies a review of written documentation coupled with interviews with personnel at various levels of the organisation to test the understanding of written practices and the extent to which they can and are being followed, together with inspection of selected areas of the plant based on interviews and the information that has come to light The result is that the inspectorate relies not only on its judgment of the management system, but seeks to validate that judgment by detained examination of how well it has actually been implemented in specific contexts.

It may well be that inspectors trained to operate under a prescriptive approach, are ill-suited to adapt to a meta-regulation approach. Certainly it took almost a decade for the Victorian OHS inspectorate to shift from a pre-Robens prescriptive approach, to broader based approach built around the central pillar of general duties.[72] Experience with the Safety Case regime as it has applied to Australian off-shore oil, confirms the need for highly skilled inspectors with risk analysis skills and a capacity to scrutinise the detailed requirements and operation of SMS.[73] As indicated earlier, it will also be crucial for the relevant legislation to specify detailed requirements in the SMS to facilitate this process.

It will also be necessary to ensure the independence of the regulator in undertaking these tasks. In recent years, there has sometimes been too close a relationship between the State government, the State controlled regulator and the rail operator, particularly where the latter is less than fully privatised. To avoid the risk of regulatory capture or co-option by either industry or government interests, to protect the regulator from conflict in the regulatory process itself, and to maintain public trust in rail safety regulation, a number of measures may be necessary to ensure an arms length relationship from other stakeholders. In part, this might be achieved by granting the regulator statutory independence, but it will be equally important to make the regulator accountable to other stakeholders and to civil society more generally[74] both as a democratic imperative and because in the context of rail safety this will be crucial to maintaining public trust. Achieving this objective implies specific provisions relating to transparency, accountability and facilitating public debate and dialogue, particularly with contractors suppliers, the emergency services and community groups. The crucial role of worker participation is addressed at Box 4.

Box 4: Worker Participation

Numerous commentators, from the time of the Cullen Report onwards, have argued that workers and their representatives, have an important contribution to make to the identification and abatement of hazards.[75] There is a strong precedent for worker participation in risk assessment

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[72] Johnstone, R. (2004). Occupational Health and Safety Law and Policy. 2nd Edition. Lawbook Company, Sydney.

[73] See Wilkinson, P. (2002). "Safety Cases: Success of Failure." National Research Centre for Occupational Health and Safety Regulation (NRCOHSR), Seminar Paper 2, at http://www.ohs.anu.edu.au/publications/pdf/seminar_paper_2.pdf accessed 9 December 2004

[74] Parker, above n21, 276.

[75] Lord Cullen called for "the involvement of the workforce" in the reconstruction of offshore safety in Cullen, above n43, Recommendation 27; and see the UK *Offshore Installations (Safety Representatives and*

processes in both Europe and Australia, and even the US, which traditionally has not given statutory recognition to worker participation, has now embraced such involvement. Not only has this been an integral feature of many OHS regimes but it is also an important feature of International Labour Organisation Convention No 174 on the *Prevention of Major Industrial Accidents*.

There are sound reasons in principle for requiring worker participation in a systems based and Safety Case regime. Workers have the most direct interest in safety of any party: it is their lives and limbs that are at risk when the law fails to protect them. Moreover, workers often know more about the hazards associated with their workplace than anyone else, for the obvious reason that they have to live with them, day by day. In particular, the hazards at work need to be identified and evaluated, and workers' experience and knowledge is crucially important in successfully completing both of these tasks. Worker participation in a Safety Case regime will also go some way towards ensuring that the Safety Case is not simply a management technique imposed "top down" by an organisation to achieve its own ends.[76]

Workers have the capacity to be involved at all stages of the development and implementation of the Safety Case. For example, they could participate in third party audits of the workplace, subject to undertakings of confidentiality in respect of details of the audit document which would normally have privileged status. Members of safety committees and safety representatives could also be directly involved in enterprise self-regulation and self-correction of system failures, by being involved in regular participative workplace inspections. At a subsequent stage, workers would play important roles both as "whistle blowers" and in triggering safety enforcement agency inspections, thereby providing checks and balances, and acting as a countervailing force to any tendency to co-option of the regulator by the regulated enterprise.

Finally, both the desirable skills base and regulatory independence (not to mention consistency and uniformity of the regulatory regime) might best be achieved by creating a new national regulator rather than attempting to make major changes to existing state regulatory structures. It is no coincidence that this approach was ultimately taken with regard to the regulatory regime for off-shore oil, after the various State regulatory regimes proved largely inadequate to the tasks given them.[77] Within such an organisation, consideration should also be given to keeping the accreditation function separate from that of auditing and inspecting the SMS, because those responsible for approving the Safety Case and SMS might be reluctant to criticise its operation.

Safety Committees) Regulations), and other commentators have argued that without this "essential ingredient", all Cullen's remaining recommendations might be rendered ineffective (Woolfson et al, above n46, 270).

[76] See Gunningham and Johnstone, above n18, 64. As Frick, K., and Wren, J. (2000). 'Reviewing Occupational Health and Safety Management – Multiple Roots, Diverse Perspectives and Ambiguous Outcomes' in K. Frick, PL, Jensen, et al (eds). (2000). Systematic Occupational Health and Safety Management: Perspectives on an International Development. Pergamon, Oxford, UK; and others have pointed out there is a danger that some management systems themselves may produce a top down, hierarchical and authoritarian approach, in which workers are instructed to act rather than consulted and encouraged to participate in any meaningful way.

[77] The National Offshore Petroleum Safety Authority will begin operations in January 2005. See www.doir.wa.gov.au/documents/ safetyhealthandenvironment/NOPSA_0402.pdf for more information.

4. The Policy Mix Revisited

We asserted earlier that finding the 'right' standards for a particular context does not imply choosing between different standards but rather finding the most appropriate mix of standards and the most appropriate emphasis. While this paper has emphasised the particular importance of a process-based approach, of safety management systems and of a Safety Case, when dealing with large commercial operators these standards nevertheless need to be understood as part of a broader mix. And that mix itself would necessarily need adjusting to deal with different types of operators. In particular, a more traditional and rules based approach would be more suited to the circumstances of small heritage operators.[78] Following Bluff and Gunningham,[79] this mix implies:

- A set of *general duties* (which has been central to OHS regulation for over 20 years but alien to many Australian rail safety regimes) provides a set of principles and broad based goals to guide duty holders in all circumstances. They have value "across the board" and in relation to all duty holders. They help to overcome a narrow 'rule-bound' mentality under which duty-holders concern themselves only with complying with specific and detailed legal requirements. General duties are complementary to process based standards and SMS in providing many of the broader based goals which those systems should be concerned to achieve;
- *Process based standards* requiring systematic management of safety are already incorporated, to some extent, in some jurisdictions.[80] However, the present approach is not sufficiently ambitious. In particular the requirements of a SMS need to be much more clearly articulated, as do the responsibilities of both regulator and regulated. Risk analysis and a risk management strategy need to become central, ideally through a Safety Case whose components are directly connected to the specifics of the enterprise's SMS.
- While it would be impracticable to impose the above requirement on small operators (for example, heritage railways) such operations would nevertheless be required to comply with general duties which include an obligation to engage in systemic safety management to the extent that is reasonably practicable (which need not imply a formal management system);
- Systematic standards are process rather than outcome based, offer no benchmark of acceptable compliance and run the risk of tokenism. For these reasons, systematic standards should be underpinned, where possible, with *prescriptive and/or performance based standards* (see further below). However, there will also be circumstances in which it is not practicable to identify prescriptive or outcome-based measures, in which case systematic standards, read in conjunction with the other principles and goals set out in the general duties, provide an imperfect but nevertheless best available strategy;
- *Performance target and performance outcome standards* (incorporated in regulations) should be used in preference to prescriptive standards in circumstances where experience

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[78] What such a mix might involve is addressed in general terms in Gunningham and Johnstone, above n18, Ch4.

[79] Bluff and Gunningham, above n56.

[80] See Department of Infrastructure, above n1.

suggests they can achieve results.[81] These circumstances are not well mapped out but are likely to include those in which actual performance can be measured, evaluated and verified.[82] Even in these circumstances, performance standards may cause challenges for small enterprises, who lack the resources and sophistication to determine for themselves, how best to achieve the specified outcome;

- The lack of concrete guidance, and the difficulties facing small companies, can be best overcome by *combining performance standards with evidentiary standards such as codes of practice* designed on an industry-specific basis.[83] In providing detailed prescriptions as to one acceptable way to meet general duty requirements and any relevant performance standard, they provide firms with both specific guidance and the flexibility to chose other means (if they so wish) to achieve performance goals. There remains a role for "Rules and Procedures … developed by the individual railway businesses as sources of operational requirements to be referred to during day to day operations."[84]

5. Conclusion: Towards Best Practice Regulation

In the past quarter of a century there has been a significant evolution in the style and form of safety regulation in Europe, North America and Australia, involving a substantial shift from a prescriptive "command-and-control" style of regulation, to a "meta-regulatory" approach using less direct and process-based means to achieve broad safety goals: means which facilitate and encourage "reflexive regulation" by influencing the systems of internal self-regulation of participating enterprises.

For technologically and organisationally complex organisations confronting substantial risks such as commercial rail enterprises, such a shift involves an obligation to adopt a safety management system. That is, it involves regulated organisations themselves engaging in the assessment and control of risks and the creation of an inbuilt system of maintenance and review, overseen by government regulators and third parties. And best results are likely to be achieved by coupling such a system with comprehensive and systematic risk analysis and control through the formal mechanism of a Safety Case which the enterprise is required to make to the regulator in order to gain accreditation. That case should be adequate to convince the regulator that the enterprise has fully engaged with and addressed the risks and adopted a systematic response to them. It should also be transparent and open to scrutiny by third parties.

However, requiring organisations to engage in such forms of internal self-reflection is only one of the requirements for regulatory best practice. Regulators must also generate the *corporate commitment* to respond effectively to safety issues, and the sort of re-thinking at senior level necessary to induce them to develop effective internal responsibility and self-regulation mechanisms. Such corporate commitment might be created by a variety of means including, where necessary: taking effective enforcement action; invoking restorative justice strategies in the

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[81] For a comprehensive analysis see Coglianese, C., Nash, J. and Olmstead, T. (2002) <u>Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Protection</u>, Regulatory Policy Program Report No RPP-03, Harvard University, Cambridge Massachusetts.

[82] Ibid. pp.11-14.

[83] See Gunningham and Johnstone, above n18, Chs 2, 4.

[84] National Transport Commission, above n7, 9.

event of serious safety lapses; providing a combination of positive and negative incentives including publicising compliance records and publicity orders; and requiring the enterprise CEO personally to sign off on key regulatory safety commitments. Another and complementary approach would be to provide the public with access to information about the relative safety performance of different rail operators.

Crucially, it is only if the self-regulation and risk-management of the industry is closely scrutinised by government with the threat of more direct intervention if it fails, that an enterprise is likely to take effective action. This is the role of meta-regulation, which involves government (or a third party) engaging in independent risk assessment on the basis of information supplied by the companies, and risk-managing the risk management of individual enterprises in order to bring about a form of what Parker describes as "triple loop" learning. Under this approach, the role of the inspectorate shifts in emphasis from that of conventional inspection of premises and plant (which relies heavily on observation of site conditions) to that of audit of the management system, raising new challenges in terms of the requisite inspectoral skills and capabilities, and arguments concerning the desirability of establishing an independent and national rail safety regulator. Meta regulation also implies significant roles for workers and third parties, both in scrutinising the safety arrangements of the rail operators and the performance of the regulators. Access to information, and in the case of workers, direct involvement in the development and implementation of the safety management system and the Safety Case, will be particularly important.

In contrast, achieving best practice regulation tailored to the circumstances of small, unsophisticated rail enterprises such as heritage railways, suggests a very different approach. For these operators a full systems based approach is likely to be impractical and beyond their capabilities. There will be a need to rely much more heavily upon general duties and performance standards, underpinned by codes of practice that provide much more concrete guidance and even prescriptive solutions for those who seek this approach. However, even for these organisations, the general duty provision should be extended to require them to adopt a systemic approach to safety, though not necessarily a formal management system.

Finally, finding the 'right' standards for a particular context does not imply choosing between different standards but rather finding the most appropriate mix of standards and the most appropriate emphasis between different types of standard. While this paper has emphasised the particular importance of a process-based approach, of safety management systems and of a Safety Case, when dealing with large commercial operators (and of a more traditional and more rules based approach for small heritage operators), these standards nevertheless need to be understood as part of a broader mix in which general duties, performance standards, and in a minority of circumstances, more prescriptive rules, all play their part.