

Discussion Paper
Assessment of Policy Implications Arising From
Research Undertaken for the Safe Design Project

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A report prepared for the
National Occupational Health and Safety Commission

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INTRODUCTION

Background

The National Occupational Health & Safety Commission (NOHSC) is undertaking a safe design project that aims to develop a greater recognition of the role of safe design in improving occupational health and safety performance in the workplace. The objectives of the project are:

- To attract the attention of key parties to their legal obligations under OHS legislation to provide plant and equipment to workplaces, which is safe and free from, risks to health.
- To identify leverage points where OHS agencies can exert influence to improve compliance with supplier's duties.
- To promote the use of safe design principles in building and construction activity to key parties.
- To explore the extension of the application of safe design beyond minimal conformance towards elimination of all hazards in the workplace.

The principle target audiences for this project are:

- Designers, manufacturers, importers and suppliers of plant and equipment.
- Designers, constructors and installers of buildings and structures.

For the purposes of discussions the generic term "designer" will be used in this report to cover the broad audience.

- Key outcomes of the safe design strategic framework are that target groups are:
- Addressing the application of safe design principles from an OHS perspective with the aim of achieving best design solutions that eliminate hazards in the workplace.

- Actively incorporating a continuous improvement process in safe design.
- Actively promoting safe design principles to members of the target groups.

The strategic plan provides for three phases of activity. The first phase has recently been completed and comprised a number of data and information gathering activities aimed at finding out more about the project target groups.

The main activities for Phase One were:

1. A "Review of Occupational Health & Safety Legal Requirements for Designers, Manufacturers, Suppliers, Importers and other relevant obligation bearers" by Gunningham & Associates, Australian National University, March 2000. Referred to in the Discussion Paper as the Gunningham Report.
2. A "Review of Literature and Review of Initiatives of OHS Authorities and other Key Players" by VIOSH Australia, Ballarat University, July 2000. Referred to in the Discussion Paper as the VIOSH Report.
3. Qualitative and quantitative survey work of the target groups to determine levels of awareness and understanding of the target groups and barriers and motivations to their take-up of safe design – undertaken by McGregor Tan Research, August 2000. This report is currently being finalised and is referred to in the Discussion Paper as The McGregor Tan study (draft report).
4. Work Related Fatalities Associated with Design Issues of Machinery of Fixed Plant in Australia 1989 to 1992, prepared by staff in the Epidemiology Unit of NOHSC September, 2000.
5. Information Package from the *Designing for Health and Safety Stakeholders Forum* conducted in Adelaide on the 6th of April 2000.

Objectives of this Review

Analysis of the outcomes of research activities and the national stakeholder forum is needed to help draw together the various strands of the first phase of the project. This will help to identify key policy issues for further consideration and strategies and initiatives to address these issues that will comprise the second

phase of the safe design project.

Particular areas of interest to be considered in the analysis are:

- What are the major themes that can be drawn from all the activities undertaken during this first phase?
- What are the main regulatory issues that need to be addressed, especially by the State/Territory OHS authorities?
- Which target groups should be given priority in terms of provision of assistance on safe design matters?
- Within these priority groups, are there particular industry sectors that should be targeted?
- What sort of guidance is needed and how can this best be developed and disseminated?
- Which current or proposed initiatives (jurisdictional, national and/or international) can be used or built on to provide the assistance required?

EXECUTIVE SUMMARY

The National Occupational Health and Safety Commission (NOHSC) has conducted a series of research studies as part of the first phase of the safe design project. These studies have included a review of legislation across Australian jurisdictions; surveys with stakeholders including designers, employers, governments, unions and consumers; a literature review; analysis of Coroner reports relating to workplace fatalities; and outcomes of a stakeholder forum conducted in April 2000.

A number of **key themes** have emerged from these studies, which have been grouped in the following six broad areas:

1. Regulatory Environment
2. Education
3. Information Provision
4. Consumer Influences
5. Management Processes
6. Encouraging Compliance

Each of the key themes and the suggested strategies to address them are discussed in the following Section headed: "Discussion" (page 11). Most of the suggested strategies are targeted, either directly or indirectly, towards the key group of design professionals, in particular, engineers and architects.

The direct strategies involve active engagement and involvement of the designers in activities and initiatives aimed at assisting them give more consideration to OHS issues at the design concept stage. The indirect strategies mainly involve "downstream" parties such as consumers, standards setting bodies, government authorities and industry associations undertaking actions which will influence the take-up of safe design.

A brief summary of the main themes and strategies is provided below. A summary table is also provided at Attachment 1 (page 37).

Regulatory Environment

The Gunningham Report raised most of the issues relating to this area. The review of current legal requirements of the project's "upstream" target groups found that there was a failure to address OHS across the entire life cycle of an item of plant/machinery, a

substance or building/construction activity. Examples of these gaps were franchisers, contractors, retailers and repairers. Problems arising from inconsistencies with the adoption of the National Standard for Plant and the absence of a national approach to construction work were also identified. There was also discussion on problems with existing legislation, such as particular terminologies used, which limit the ability of the OHS authorities to bring successful prosecution actions.

The VIOSH report and the draft McGregor Tan report found that generally there was a low level of awareness among the target groups of their obligations in relation to safe design.

The discussion paper suggests a number of strategies to address these issues. However, as an initial step, it is recommended that a workshop attended by representatives of the NOHSC member agencies and key target groups be convened to discuss the range of issues and agree on an approach for the way forward.

Education

The key theme which emerged in relation to education was the need for relevant undergraduate and professional development courses to include training on safe design from an OHS perspective. The design professional groups are suggested as having a key role to play in this regard as they are directly involved in the accreditation of courses. Incorporation of safe design issues in professional competency standards will help to have the issue seen as an integral component of a 'whole' system of work rather than an additional, separate task.

Information Provision

There is a need for more information on how to meet obligations in relation to safe design, which is easy to understand, provides practical guidance and is easily accessed. Apart from data available from coroners' investigations (eg. the NOHSC fatalities study database), there is a paucity of useful statistical information available on the contribution of poor design to workplace traumatic injuries and deaths.

A range of strategies are suggested to address this issue including partnerships between relevant government authorities and professional/industry groups and sharing and promotion of good initiatives and strategies. Strategies to influence the content of industry codes and standards that are frequently used by designers are included. A national access point to link users to useful information available on the Internet is also recommended.

Consumer Influences

Two of the studies highlighted the important role that consumers can play in influencing designers and other upstream groups to take greater consideration of OHS safe design issues at the design concept stage. A key strategy suggested was assisting consumers to include safe design requirements in specifications for contracts and purchasing documents when acquiring new plant and machinery or contracting for construction work. A need for more consultation and feedback processes on safety issues between designers/manufacturers and clients was also identified.

Management Processes

The main theme here was the need to integrate processes to consider safe design from an OHS perspective in to existing organisational management systems and systems-based approaches that encourage continuous improvement and cultural change. OHS authorities are encouraged to develop programs that would facilitate this process. Review of existing OHS management systems such as SABS and SafetyMap to ensure inclusion of safe design requirements is also recommended.

Encouraging Compliance

While a number of initiatives in the State/Territory OHS authorities were identified which encouraged and/or assisted compliance with safe design requirements, a more strategic, national approach is needed. More use of rewards and recognition schemes and promotion of current initiatives that provide practical guidance on complying with requirements are recommended. Consultations between OHS authorities and accreditation agencies to integrate safe design in existing auditing and accreditation processes is also suggested.

DISCUSSION

Section One – Regulatory Environment

Part A – Themes and Issues

1.1 Legislation

1.1.1 “Upstream” Obligation Bearers

The Gunningham Report (page 2) identified gaps in liability for upstream obligation bearers when considering the life cycle of an article, substance or activity. It is suggested there is a need to expand the legal obligations for upstream stakeholders.

Designers, manufacturers, suppliers and importers of plant and equipment currently have OHS obligations in relation to safe design. In a few states, designers of buildings and structures also have similar obligations. The Gunningham Report suggests using a “cradle to grave” model, which includes other upstream obligation bearers such as:

- Franchisers
- Contractors and subcontractors
- Advertisers
- Second hand goods dealers
- Auctioneers
- Distributors
- Retailers
- Repairers
- Purchasers
- Small business

In addition, clients such as governments and private developers are critical target groups in the “cradle to grave” model.

The Gunningham Report (page 61) suggests that obligation bearers should also extend to designers and suppliers of services and management systems to business organisations. This would mean that ‘safe design’ obligations would not just be confined to workplace ‘hardware’- it would also cover the design of management systems which are less obvious but which also have the potential to impact on occupational health and safety.

The VIOSH study (Page 17) describes the current legislative approach as “ad hoc” and focuses around manufacturers and suppliers.

1.1.2 Process-based standards

The Gunningham Report (page 60) noted the general trend, both in Australia and internationally, to replace outdated prescriptive regulations with broader based performance standards in conjunction with process standards. By incorporating the **procedures** for achieving the desired result, process-based standards are more likely to encourage continuous improvement or industry best practice. However, there will still be situations where other types of standards, such as detailed technical specification standards, are more appropriate or should operate in tandem with process-based standards.

The Gunningham Report (page 61) suggests a challenge for the ‘next generation’ of regulation which:

- Integrates process-based standards into a full-blown organisational and systems-based approach.
- Integrates process safety management techniques with the use of engineering design standards.

The combination of methodologies and approaches will help enterprises to achieve safety AND profitability goals. For example, engineers can benefit from first-hand knowledge of operating personnel and vice versa.

1.2 Uniformity of National Standards

The Gunningham Report (page 24) highlights a lack of consistency in the adoption of the National Standard for Plant, which is causing confusion and may seriously threaten the effectiveness of the standard.

The Gunningham Report (page 59) also identifies the lack of a uniform, national approach relating to construction work. Construction firms operating nationally need to comply with a range of inconsistent legislative requirements, standards and codes of practice in the individual jurisdictions.

The research by McGregor Tan (draft report) also identified concerns among target groups about the complexity and lack of consistency of existing regulations.

1.3 Awareness of regulatory obligations

The McGregor Tan study (draft report) and the VIOSH study (page 40) found that awareness of OHS obligations in relation to the safe design of plant and machinery and building and structures appears to be quite low. Very few obligation bearers acknowledge that they have legal obligations. They have a misconception that Australian Standards and the Building Code of Australia (BCA) were part of OH & S legislation, emphasising the low awareness and lack of understanding with regard to safe design in legislation.

A common theme for these obligation bearers was that they apportion blame to users who “don’t safely use plant and machinery or buildings and structures”. They do not always acknowledge that safety measures should be built in at the design stage. They depend on users following complicated procedures to avoid injury. The Gunningham Report (page 37) discusses the term “when properly used” and the consequent reduction in scope of the duty imposed on the designers.

The VIOSH study (page 27) also found the level of knowledge and perception of safety law to be less than optimal in the target groups. They indicated specific difficulties with the process based OHS legislation (such as hazard management, hierarchy of control, practicability, etc) for the target groups who generally work with more prescriptive guidelines e.g. Building Code of Australia.

1.4 Enforcement

There is a low level of prosecutions under Australian OHS statutes relating to designers and other target groups, as researched in the Gunningham Report (page 64), which found an absence of a credible enforcement strategy in Australia. The report noted that a successful prosecution of an architect by the UK Health & Safety Executive had sent a stronger signal to the upstream groups than earlier education programs. Currently, these groups are featured very rarely in enforcement actions in Australia.

One problem with prosecuting “upstream” professionals such as architects, designers and consultants relates to the limitation period within which agencies can take enforcement actions. The Gunningham study (page 64) describes how the breach of the obligation may take place at the time of the design or supply of, for example, plant, but may not be detected by the users until much later. The intervening time may limit prosecution of the upstream

obligation bearer due to the "limitation period" within which the agency can prosecute.

The Gunningham Report (page 43) also suggests that the current requirements for "upstream" groups do not provide an adequate level of legal protection for users of plant and machinery in a number of respects. These include:

- Interpretations of the term 'when properly used' which is frequently used in the legislation. The Gunningham Report (pp37, 38) acknowledges that the expression addresses a legitimate concern of "upstream" obligation bearers. That is, it prevents their being liable for risks to workers arising from the use of plant or machinery in a workplace in a way for which it was not designed to be used. However, the report suggests that the use of this term reduces the scope of the duty owed by the "upstream" obligation bearers and that their concerns are met by existing requirements of reasonable practicability or reasonable precautions and proper diligence.
- Doubt as to whether the legislation extends to hazards associated with the cleaning and maintenance of plant and machinery.
- Narrow information requirements.
- Limiting the circumstances for the issue of prohibition notices to those only of imminent risk – this excludes risks with plant identified at the point of manufacture or supply.

Part B – Suggested Strategies/Actions

This part identifies a range of strategies to address the issues raised in Part A that relate to the general regulatory environment. They have particular significance for the State/Territory OHS authorities.

It is suggested that as a first step, a workshop attended by senior representatives from the NOHSC member agencies and the key target groups, such as the design professional associations, be convened to discuss these issues and suggested strategies and agree on an approach for the way forward. This should help to facilitate a consistent approach to resolving these matters.

1.5 Legislation

1.5.1 Expansion of Obligation Bearers

Consideration should be given to expanding the groups with OHS safe design obligations to include those "upstream" groups identified in 1.1.1 of Section One of this discussion paper. This

would provide a 'life cycle' approach in the assignment of OHS responsibilities for safe design to all people in the supply chain from the client through designers to employees. The European Construction Sites Directive and the British Construction (Design and Management) Regulations are examples of the 'life cycle' approach.

The legislation needs to be written in plain English so that obligation bearers can understand their duties and responsibilities. For example, "the plant safety trainer's guide" provided by WorkCover (South Australia) has been specifically developed to cover the full life cycle of an item of plant.

1.5.2 Obligation Bearer Versus "Risk Based Activity" in Legislation

The focus on individual obligation bearers can often be confusing when an employer may "wear several hats". i.e. they may be involved in the design of a workplace when new plant and equipment is installed, but also be involved in modifying or manufacturing, and supplying other plant and equipment. Hence, consideration should be given to changing the focus of legislation to "risk based activity" rather than defining responsibilities for every obligation bearer.

The focus of such legislation would be the identification and reduction of risk within the workplace based on the concept of a "totally safe design package". This could be based on a continual improvement approach using risk management principles in safe design.

1.5.3 Approach to regulation

Consideration should be given to a new approach to regulation which:

- Integrates process-based standards into a full-blown organisational and systems-based approach.
- Integrates process safety management techniques (which focus on management systems) with the use of engineering design standards (which address equipment performance).

1.6 National Consistency

State/Territory OHS authorities should evaluate their legislation in the context of developing a more uniform approach to dealing with

safe design from an OHS perspective in relation to plant and machinery and buildings and structures.

1.6.1 Plant and Machinery

Jurisdictions should be encouraged to address current inconsistencies in the adoption of the National Standard for Plant that relate to safe design.

Key outcomes would be agreement:

- On the principle of functional independence for design verification.
- To develop a list of comparable international design standards for plant acceptable to all jurisdictions.
- That the requirement for a documented risk assessment will be substituted for inspection by a competent person.

In this regard, it is noted that an Occupational Health and Safety Administrators Group (OHSAG) is currently looking at ways of resolving a number of inconsistency issues relating to the adoption of the national plant standard and that NOHSC may also be undertaking a review of the standard.

A process for incorporating international quality standards also needs to be considered. For example ISO9000 has become a world wide standard used by companies conducting business internationally. Jurisdictions should critically assess their legislative program in light of ISO initiatives.

1.6.2 Buildings and Structures

Consideration should be given to establishing national guidelines for a consistent approach to construction work, which should include appropriate requirements for safe design from an OHS perspective. The basis for these guidelines could be the NOHSC *Draft National Standard for Construction Work* which aimed to reform the myriad of existing acts and regulations (NOHSC, 1996); 44. The draft included obligations for persons who design or commission the design of buildings and structures to ensure they can be safely erected, worked upon and maintained. In addition, the NSW Government's CPSC OHS Management System Guidelines, which include safe design as an element, have been recognised as the desired benchmark by the Australian Procurement Council.

Other possible models include the European Community (1992) Directive to Implement Minimum Health & Safety Requirements at

Temporary or Mobile Construction Sites and the British Construction (Design and Management) Regulations, which implemented the European Directive.

1.7 Enforcement

State/Territory OHS authorities should give consideration to developing a credible enforcement strategy that will:

- Allow for occasional, selected prosecutions of “upstream” groups.
- Remove current difficulties in the legislation that limit the ability to take enforcement action.
- Further develop targeted auditing activities.

1.7.1 Prosecution of “upstream” groups

OHS Authorities should consider developing an enforcement strategy that includes the possibility of effective prosecution of upstream obligation bearers. The approach should involve a strategic and very limited use of prosecution action to raise awareness rather than an “open slather” approach.

An alternative, or additional approach might be to apply the enforcement model used by the Australian Competition and Consumer Commission (ACCC). Rather than focus on remedies that are available from a Court, the ACCC thinks much more broadly about desired outcomes in terms of what the market needs and a more strategic approach to achieving those outcomes. In particular cases, such outcomes have included internal investigations and compliance programs.

1.7.2 Removal of difficulties in bringing enforcement action

Consideration should be given to the range of issues suggested in 1.4 above as contributing to inadequate levels of protection in existing legislation. The aim would be to determine the extent to which these issues place limitations on the legal protection of users of plant and machinery and how they might best be resolved. The ‘Regulatory Environment’ workshop suggested at the beginning of Part B of this section (page 16) could provide the opportunity for initial consideration of these matters.

1.7.3 Limitation Period

The legal processes that define limitations of liability should be reviewed to ensure that upstream obligation bearers would be held

accountable for unsafe designs that may not become evident until an OHS incident occurs.

1.7.4 Inspectorate/auditing

Greater emphasis on inspecting safe design aspects of plant and machinery such as interlocks and guarding should be incorporated in OHS management audits with a requirement for auditors to have competencies to assess the appropriateness of this guarding based on the task analysis of both the operators and the maintenance staff.

Section Two – Education

Part A – Themes and Issues

2.1 Undergraduate Education of Professionals on Safe Design

Both the McGregor Tan (draft study) and VIOSH study (page 40) found a need for undergraduate education of target groups as the ideal opportunity to influence designers “at source”.

There is a need for provision of clear and user-friendly information to facilitate greater uptake of Safety into Design principles. A strategy, for development and dissemination of this information and assistance for the educators is required.

2.2. Ongoing Professional Development of Obligation Bearers

The VIOSH study (page 36) also identified the need to use professional development training courses to update the knowledge of practising designers on the principles of safe design and OHS in general.

The State/Territory OHS Authorities require closer partnership with Professional Associations representing the key project groups. The Gunningham Report (page 29) highlighted the benefits of partnerships between industry and government bodies responsible for legislation. An example is the NSW Government “Memorandum of Understanding” with the construction industry, which involves the construction industry, unions and employer associations.

The theme of assisting the industry partners to conduct professional development training and leadership in improving safety in design is evident in all studies.

Part B – Suggested Strategies/Activities

2.3 Undergraduate Courses

The key design professional associations need to identify and define the key competencies that should be included in the curriculum of undergraduate courses to cover the area of safe design.

Benchmarking of existing courses to determine the critical competencies considered to be the basic requirements for safe design from an OHS perspective should be undertaken.

A range of “tools” should be developed in consultation with the educational institutions and the government jurisdictions, which could be incorporated into the teaching materials used to cover the area of safe design. For example, checklists and guidance material developed by the jurisdictions to promote the legislative requirements could be incorporated within the required texts and practical resources used within the teaching of design professionals.

NOHSC could adopt the role of ‘facilitator’ to progress these strategies, for example, by providing seed funding and coordinating arrangements for workshops/meetings.

Examples of such courses include the University of South Australia “Industrial Design”. Some relevant resources specifically developed include:

- NOHSC – “Plant Design” – Making it Safe (1995)
- NOHSC – “OH & S For Engineers” (1990)
- WorkCover Corporation (SA) – “Plant Safety Trainer’s Guide” (1998)
- NOHSC – “National Guidelines for Integrating OHS Competencies into National Industry Competency Standards (1998).

Organisations invested with the authority to accredit courses should be consulted by NOHSC to negotiate the inclusion of safe design from an OHS perspective in courses currently being assessed for accreditation. This should not only cover the content of the course, but also the competencies of those who are providing instruction and training to the course. It should also include the use of

practical exercises to ensure that the graduates can demonstrate the competencies for safe OHS design.

Key resources which may be required by Institutions to facilitate the ongoing development of safe OHS design within their course structures should be identified. This may require the development of a closer relationship between governments, OHS authorities, relevant professional associations and NOHSC, as well as liaison with the industry stakeholders such as unions and employer associations. They can link in expert lecturers and opportunities for case studies to ensure that the graduates of these courses have every opportunity to explore the concept of safe OHS design within their respective areas of study.

Part of the provision of these resources would be a fostering of a multi-disciplinary team approach to ensure that the graduates can identify what OH & S expertise may need to be sourced in the evaluation of the design of plant and equipment or buildings and structures.

2.4 Professional Development of Practitioners

NOHSC and NOHSC stakeholders should establish partnerships with the key design professional organisations to provide them an opportunity to obtain OHS related material and access to technical speakers in making presentations to the professional associations. This may include presentations to workshops and seminars that are specifically convened to meet the requirements of professional competencies for maintaining accreditation as a professional within the various relevant groups.

Professional associations and relevant industry groups could consider developing targeted training materials. NOHSC could facilitate this process, for example, by providing seed funding.

2.5 Tradespersons

The data relating to workplace fatalities (NOHSC: *Work-related traumatic fatalities in Australia, 1989 to 1992*) indicates the high number of fatalities where, for example, guarding of plant and machinery had been removed, modified or inappropriately installed. Targeting of programs that directly impact tradespersons is required.

NOHSC should consult with the apprenticeship programs and trade certificate courses within the TAFE sector to determine where safe

design is integrated into the training of tradespeople working with plant and machinery.

Section Three – Information Provision

Part A – Themes and Issues

3.1 Improved Sources for Information on Safe Design

Whilst various databases of valuable resource materials have been identified in the VIOSH study (page 41) e.g. “Hazard Alerts”, “OHS Solutions Database”, “SHARE database”, they operate independently with poor cross referencing.

The McGregor Tan study (draft report) found that just over half of their respondents have accessed information on OHS legislation requirements. They expressed concern that many organisations are not keeping themselves properly informed of OHS developments and obligations.

The Gunningham Report (page 58) highlighted the need for “plain English” legislation to assist obligation bearers to understand their duties and responsibilities.

The VIOSH report (page 37) also identified the need for improvements in information about safe design, including the need for a national database accessible to the target groups.

3.2 Limitations of available statistical data.

Apart from the NOHSC fatalities study database, none of the other phase one information gathering activities identified any statistical sources that could provide useful data on the contribution of poor design to traumatic workplace injuries and deaths. (Note: The NOHSC fatalities study obtained detailed information from coronial files of all work-related traumatic fatalities over the period from 1989-1992).

For example, workers compensation data does not provide sufficient detail to assess the role of safe design in the injury analysis.

Part B – Suggested Strategies/Activities

3.3 Information through Partnering

The development of “partnerships” between the key design professional groups and the State/Territory OHS Authorities involved in legislation development should be considered. For example, the NSW Government has adopted a “memorandum of understanding” with signatories from construction contractors with the support of the construction industry, trade unions, and employer associations “to remove or minimise potential workplace hazards at the point of design to ensure a safer work environment”.

3.4 User Friendly Tools for a Systematic Approach to Safe Design

Practical tools should be developed to guide safe design obligation bearers through a simple, process-based risk assessment program. For example, the Victorian Government Manual Handling Regulations (1999) provide a long and short version of a risk assessment worksheet. These provide the user with the choice of an expanded guidance checklist for novice assessment teams, or a one page summary checklist for the experienced risk assessment teams.

NSW WorkCover’s Construction Hazard Assessment and Implication Review (CHAIR) Guidelines bring a systematic management approach to consideration of safe design in the design and construction process of buildings and structures.

Existing risk assessment tools need to be subjected to usability testing to test the extent to which they address requirements for “upstream” obligation bearers. Hence, a range of tools may be necessary to address different parts of the life cycle process.

International benchmarking of process-based standards indicate a return of more prescriptive guidance relating to safe design. For example, the Washington State Ergonomic Standard now provides a range of “caution zone jobs”. This provides more prescriptive guidance to the risk assessment team on the criteria and assessment methods that should be considered within a process standard framework.

The Australian OHS authorities should assess the provision of more practical, and, where relevant, quantitative guidance for the workplace to better understand the outcomes of research as it relates to plant and equipment design.

3.5 Codes/Standards Setting Bodies

3.5.1 Building Code of Australia (BCA)

The BCA is used by all persons involved in the building and construction industry including designers. It therefore has the potential to significantly influence designers on the safe design of buildings and structures. However, the BCA only addresses safe use for the end user of the building or structure - it does not address safety in the actual construction and maintenance processes.

The Australian Building Codes Board (ABCB) has begun a review of the current Building Code of Australia and a review committee is advising ABCB on a range of contemporary issues which need to be addressed in the new Code. It is suggested that NOHSC initiate consultations with members on the review committee and senior staff at the ABCB office with the aim of obtaining agreement for OHS safe design issues to be included as a key component of the new code. This is an important way of influencing designers in terms of safe construction and maintenance of buildings and structures and their use as a workplace.

3.5.2 Australian and International Standards

Australian and International Standards are frequently used by designers of both plant/machinery and buildings/structures. They are referenced in the BCA. An increased focus on safe design issues in these standards also has the potential to significantly influence designers.

It is suggested that consultations between NOHSC and Standards Australia be initiated to consider ways in which more emphasis can be placed on OHS safe design issues in the development or review of relevant standards.

Representatives from design professional groups, government authorities, industry associations and unions, who participate in standard development and review committees should be encouraged to promote the inclusion of safe design in relevant Australian Standards.

OHS Authorities should consult with industry specific bodies that develop and administer standards that may impact on safe design e.g. Local Government Design Guidelines; Health Industry's Hospital Accreditation program.

3.6 Sharing of Good Safe Design Initiatives

The development of the NOHSC solutions database, together with other Government databases such as the SHARE in the Victorian WorkCover Corporation, should be linked to the websites of the professional associations and the teaching institutions for designers.

A proforma sheet summarising good design initiatives should be sent to courses for design students requesting that these sheets be completed with project work undertaken as part of their studies. They could then be added to these databases.

The encouragement of industry based safe design databases should also be part of the consultation with peak industry organizations. These should be seen as a service to the members within these industry groups and linked to the websites of the industry associations and unions. They should not only be seen as a method of disseminating good ideas, but also as an opportunity for networking within industry sectors of individuals who are innovative and promoters of safe design.

The literature search of international databases should include a range of existing initiatives where safe design projects have been collated. These include:

- The ILO ergonomic checkpoints publication.
- The Swedish Government (Good Ideas) Manual.

Further, the extensive publication prepared by the Department of Labour, USA, OSHA in Washington DC, as part of their preparation for the proposed ergonomics standard, includes extensive numbers of ergonomic case studies. These are included also within the many testimonies that were presented to the OSHA hearings during 2000, as part of the US Congress evaluation of the merits for an ergonomics standard.

Case studies from these international resources should be included on the NOHSC Solutions Database.

3.7 Multidisciplinary Design Assessment Teams

A range of “products” should be identified in consultations with the industries that can be incorporated into these multidisciplinary evaluations. For example, products that are used or are being trialled within the construction industry include:

- CHAIR (Construction, Hazard, Assessment, Implementation Reviews).
- ROAD (Risk, Opportunities, in Architectural Design).
- HAZOP (Hazard and Operability Studies).

These, and other systems that can be useful tools for multidisciplinary teams should be identified by the jurisdictions and developed as tools for general use. They should also be included in training for designers.

3.8 Facilitating Access to Internet Sources

A central access point is needed to assist designers to obtain information available on the Internet on safe design from an OHS perspective. It is suggested that the NOHSC website would be the best place to provide this access. It is not proposed that a complex database be built. Rather a front page or "portal" which would direct users to relevant sites that are already available. A brief explanation of the information on each site together with the link should be provided. Examples of existing sites are the NOHSC Solutions and the Hazard/Safety Alerts that are available on a number of the State/Territory OHS Authority websites.

Consideration should be given to the development of Case Studies on good and bad design for the OHS site. There are a number of case studies in the publication: "Occupational Health and Safety for Engineers; A Resource for Engineering Education which could be adapted for Internet use. Another potential current source for case studies highlighting poor design is work being done by an Engineering Masters student at Ballarat University, using the Victorian Coroner's database.

3.9 Coroners' Database

A longer-term strategy could involve the use of the Coroners' database that is currently under development. Approved individuals and organizations will have access to the database from around January 2001. For the first two years or so only general surveillance work will be possible as there are unlikely to be enough relevant cases included in the database to allow useful consideration of specific areas. However, over the longer term, there may be enough cases to allow more detailed analysis. It is likely that such analysis will use the National Coronial Inquiry System (NCIS) to identify cases of interest and to provide broad information on the main variables of interest. More detailed information would probably have to be obtained directly from the coronial records.

3.10 Overcoming statistical data limitations

It is acknowledged that overcoming the limitations in relevant statistical data bases identified in 3.2 above is a difficult problem. Given that it is unlikely that resources would be available to develop a specific database to address this, it is suggested that consideration be given to developing a more coordinated approach to reporting and collating safe design issues identified through the activities of OHS authorities such as inspections, targeted audits and incident reports. This would help to indicate specific areas for priority attention in terms of addressing poor design.

3.11 Further research

Further research into the development of guidelines relating to machine guarding should be facilitated through the jurisdictions. In particular, the guarding systems involved with the reported fatalities involving moving conveyors outlined in the NOHSC data should be initially targeted.

The fatalities relating to the use of forklift trucks should be subjected to longitudinal studies to determine aspects of design that may involve particular design features of forklift truck to increase the probability of series injury to the driver or persons nearby.

Section Four – Consumer Influences

Part A – Themes and Issues

4.1 Roles of Consumers to Influence Safe Design

The VIOSH study (page 40) highlighted the role of consumers to influence safe design. Not only can they build safety into purchasing specifications, but they can provide feedback to ensure ongoing improvement of design. This applies to plant and equipment, building and structures, as well as materials and substances.

The encouragement of greater communication between designers and clients about safety requirements was identified in the McGregor Tan study (draft report).

4.2 Development of Safe Design Resources for Consumers

Respondents to the survey undertaken in the McGregor Tan study (draft report) indicated that the inclusion of safe design specifications on purchasing documents and tenders would encourage more consideration of safe design issues by both the designer and client and their integration into normal daily business. Resources need to be developed to assist this process.

Part B – Suggested Strategies/Activities

4.3 Consumer Awareness

Targeting of particular consumer groups should occur within the jurisdictions based on their injury data that identifies where poor design has been associated with or contributed to workplace illness or injury. An example is the Victorian WorkCover Authority's Health and Aged Care Project, which addressed high injury levels in the health care sector. One aspect of this project was the development of Design Guidelines for Safer Handling of Patients/Residents.

The use of trade magazines and seminars to provide case studies showing the impact of safe design should be considered by the State/Territory OHS Authorities and peak industry organizations.

General awareness of safe design across the consumer population should be promoted through the media where opportunities arise such as recall of faulty product due to poor design and prosecution judgements arising from serious injury or fatality. E.g. the NOHSC data on workplace fatalities study.

4.4 Cross Industry Support Networks

The OHS Authorities should consult with targeted industry sectors with the major corporations who have their internal OH & S management systems that have direct expectations and implications for their suppliers and customers. For example, the Ford Corporation has their Q1 program for accrediting the systems used by their suppliers and customers.

An objective to understand the methods of communication and working with a network of small and medium enterprises (SMEs) to set and maintain a level of design standards, auditing and evaluation to ensure a high quality product through the life cycle requires clarification.

4.5 Development of resources for consumers

Consideration should be given to developing mechanisms for using customer purchasing power to achieve safe design using the power of big purchasers, in particular, federal and state government agencies. This could include the development of resource material to assist consumers to influence safe design 'from below' by including safe design specifications in their tender/purchasing documents and processes.

A possible model for consideration is the NSW Governments CPSC OHS Management System Guidelines, which include safe design requirements, together with its Procurement Code of Practice, which includes OHS elements.

Section Five – Management Processes

Part A – Themes and Issues

5.1 Integration of OHS into Management Processes

The McGregor Tan study (draft report) suggested that safe design should be an integral part of management processes and operations. This would help to give all groups in the life-cycle of plant and machinery and buildings and structures to develop a greater appreciation of the benefits of safe design.

The Gunningham Report (page 61) recommends integration of performance/process-based standards into full-blown organisational and systems-based approach. Through the integration of safety management systems with engineering design standards, designers can benefit from the first-hand knowledge of operating personnel and vice versa.

Part B – Suggested Strategies/Activities

5.2 OHS Management Systems/Audit Tools

When designing or reviewing management systems and/or audit tools include a mechanism or tool, such as a checklist, which would ensure that design issues are considered at appropriate points in the system.

An example of an existing Management System which could be reviewed to ensure that safe design issues are sufficiently highlighted is AS 4801 (2000) – *OHS Management Systems – Specification with Guidance for Use*”.

Examples of existing OHS audit tools that could be reviewed to ensure that safe design issues have been incorporated are:

- The SABS OHS audit tool used in South Australia.
- The SafetyMap Audit Tool utilised in Victoria, NSW, and Tasmania.

5.3 Programs which promote and assist the integration of OHS Safe Design strategies

Jurisdictions should develop programs that promote and assist the integration of performance-based systems into a full-blown organisational and system based approach. This approach should outline the possibility of building on continuous improvement and cultural change within an organisation.

For example, an integrated control system should recognise the interdependency between all aspects of safe design that accept the importance of a quality management-based information strategy that promotes the benefits of safe design.

Such an approach could include the integration of process/performance safety management techniques (which focus on management systems) with the use of engineering design standards (which address equipment performance).

Section Six – Encouraging Compliance

Part A – Themes and Issues

6.1 Initiatives encouraging compliance

The VIOSH report (pages 15-24) identified some initiatives in the States/Territories that encourage compliance and/or provide practical guidance to assist compliance. These include:

- The Victorian WorkCover Authority’s “Design Guidelines” developed as part of its Aged Care and Health Project.
- NSW WorkCover’s Construction Memorandum of Understanding (MOU). Under the MOU, principal contractors have committed

to addressing safety at the point of design. Guidance for doing this has been developed in the form of the *Construction Hazard Assessment and Implication Review (CHAIR) Guidelines* for the Construction Industry. CHAIR is the first attempt in Australia to apply a systematic approach to safe design for construction and to bring together the key stakeholders for that purpose.

- NSW WorkCover has also undertaken a range of information seminars targeted at design professionals.
- The NSW Government's procurement policy requires construction companies to meet OHS Management System guidelines that include safe design as an element. It has also established the Construction Industry Improvement Roundtable, which has an upstream focus as one of its objectives.

Part B – Suggested Strategies/Activities

6.2 Recognition and Rewards

Recognition of successful safe design initiatives that create an increased awareness of possibilities and also assist in developing a culture of high achievement as an acceptable goal. This recognition can occur within industry sectors.

Safe design awards can also be included in the State/Territory OHS Authority and professional organisations' awards programs. These awards should include criteria on the sustainability of the outcomes as well as other integrated achievements such as quality and environmental outcomes. Assessment of applicants should include a requirement for them to present an OHS risk assessment covering safe design.

6.3 Promotion of current initiatives

Current initiatives which provide practical guidance on incorporating safe design from an OHS perspective at the design concept stage should be promoted to encourage their take-up at a national level. Examples of these include the NSW WorkCover CHAIR Guidelines and the Victorian WorkCover Authority's Design Guidelines for Aged and Health Care. Initially, the focus of promotional activities should occur through the State/Territory OHS authorities and also design professional groups.

6.4 Accreditation Agency Management Systems

Consultations should be initiated between the OHS Authorities and accreditation agencies within each jurisdiction to identify areas

where safe design can be integrated into the auditing and accreditation processes. These areas could include, for example:

- **Planning – Local Government** - The building planning professionals assess building plans prior to the issue of construction permits and occupancy certificates. This provides an opportunity to assess the safe design issues prior to construction.
- **Food Safety** - The inspectors visit restaurants, food handling factories, and other workplaces where commercial kitchens are provided e.g. hospitals, nursing homes, etc. These inspectors should be looking at the design of these systems of work from an OHS perspective as well as from a food hygiene perspective.
- **Nursing Home Accreditations** - A system involving the Commonwealth Department of Health requires nursing homes and public hospitals to be accredited on a cyclical basis. This accreditation is generally focussed to the care of the residents to ensure that the standards are maintained across Australia. Safe design could be included within the assessment criteria.
- **AQIS** - These agents work with the Department of Primary Industry across Australia to inspect the quality of primary product to meet export health requirements. They often work within export industries such as abattoirs. These staff could also be involved as agents to assess safe design within these workplaces as part of their competency based training.

6.5 Patents Assessment

Consultation with the patents evaluation officers should be initiated by NOHSC. This should ensure applicants required to submit an OH & S risk assessment as part of their patent application package for plant and equipment items.

Summary Table Of Themes And Strategies

THEME	STRATEGY
1. Regulatory Environment	
Upstream Obligation Bearers	Expand the obligation bearers to cover the "life cycle" of design to include upstream groups.
Risk based activity approach	Legislation should cover the activities within the "life cycle" of design due to obligation bearers often wearing various stakeholder hats.
Plain English explanations	Useability studies should be conducted to ensure the legislation can be understood by the obligation bearers.
Uniformity of Standards	OHS Authorities should consider evaluating their legislation to provide a more consistent approach to the adoption of the national standard for plant and to provide a nationally consistent approach to construction work.
Performance/process based approach	Consideration should be given to adopting regulation which integrates process-based standards into organisational and systems-based approaches and which also includes some specification where this is identified as necessary.
Knowledge of Safety Legislation	Obligation bearers require specific details of legislation covering them to ensure they are aware of their own obligations rather than the designer's current focus on the operator to "use the plant, equipment, building or structure safely".
Enforcement of Legislation	Selected prosecution of upstream groups is necessary to help raise awareness of their legal responsibilities.
Limitation of time clauses	Legislation should allow coverage of upstream groups, dating back from the time when problems are detected, without the limitation of time restricting the chance of prosecution.
Inspection competencies	OHS Authorities should develop competencies within their Inspectorate to ensure design issues are included in the inspection programs.
2. Education	
Undergraduate training	OHS Authorities should assist in the development of "tools" for the training of Upstream groups to cover the area of safe design.
Upstream Course competencies	Accreditation agencies responsible for courses involving upstream groups should be contacted to ensure safe design is included in the course curriculum and within the competencies of the course presenters.

Attachment 1

THEME	STRATEGY
Professional development of Upstream groups	Professional Associations representing the Upstream groups should be involved in the inclusion of safe design initiatives for their members utilizing materials and presenters from the OHS Authorities and the competent stakeholder groups.
Partnerships between stakeholders	Professional groups with expertise and involvement in safe design should develop partnerships as multidisciplinary teams to ensure safe design of work systems.
Tradespersons training	Specific safe design training modules should be provided to tradespersons to ensure that risk management competencies are acquired.
3. Information Provision	
Identify a single "portal" to simplify access to the safe design databases.	Develop material for the NOHSC website which will provide a central access point to existing safe design information and databases.
Case studies available on safe design	Case studies of examples of good and bad design should be developed as a resource for access on the internet.
OHS Authorities/industry partnering	Stakeholders such as OHS authorities, unions and employer groups should develop partnerships within targeted industry sectors to develop programs such as "memoranda of understanding" relating to the provision of a safe work environment.
User friendly tools	The OHS Authorities should review the tools provided in the regulations and codes of practice and develop "user friendly" tools targeted to the upstream obligation bearers.
Use of Coroners' database	The OHS Authorities should use the Coroners' database to target priority design issues. This should integrate with the Prosecution strategy.
Integration with organizational strategies	Stakeholders should be encouraged to integrate safe design into their organization's safety management systems
Integration with the Building Code of Australia and Standards Australia	Stakeholders with representation on Standards setting bodies should promote the inclusion of safe design in to the criteria used to assess compliance with these Standards.
Technical and process approaches to Standards formulation	Standards bodies should be encouraged by OHS Authorities to incorporate the process based models of risk assessment together with the relevant technical criteria in the assessment of compliance.
Introduce "buildability" into the evaluation process	The assessment of safe design should include the concept of "buildability" to ensure that the life cycle issues are included in the risk assessment processes.

Attachment 1

THEME	STRATEGY
Liaison with accreditation agencies	OHS Authorities should develop linkages with Accreditation agencies such as Local Government Health and Building Advisers; and Health Industry Hospital accreditation agencies to ensure that safe design is integrated into their assessment criteria.
Develop the SHARE style of databases to embrace a wider range of safe design applications	OHS Authorities should link with teaching courses and Professional Associations to obtain a wider variety of shared interventions. They should widely distribute a preformed sheet to facilitate the documentation of the outcomes. The monitoring of international databases for identifying safe design ideas should be undertaken.
Evaluate the consultation products used by multidisciplinary teams to assess safe design	Identify products such as CHAIR; ROAD; HAZOP, where safe design could be incorporated into the consultative evaluation processes.
Further research into safe design guidelines targeted to specific stakeholders	OHS Authorities should liaise with the key project groups to develop a range of guidelines to provide practical advice on safe design for particular hazards that are often involved in traumatic workplace accidents.
4. Consumer Influences	
Consumer awareness of safe design issues	OHS Authorities and relevant industry groups should develop consumer awareness programs utilizing trade magazines and industry seminars
Media program	OHS Authorities should include case studies of prosecutions arising from unsafe design in their media programs to raise consumer awareness of the legislation and the safe design initiatives.
Inclusion of safe design criteria in Purchasing and Tender documents.	Consumers should be encouraged to include safe design into their purchasing and tender documentation.
Industry support networks	OHS authorities should utilize existing networks within specific industry sectors to provide practical guidance in safe design, particularly for the benefit of SME workplaces.
5. Management Processes	
Integrate safe design into the OHS management systems	OHS Authorities and stakeholders should review their OHS Management systems products to ensure that safe design principles have been integrated into the verification criteria.
6. Encouraging Compliance	

Attachment 1

THEME	STRATEGY
Compliance with the existing legislation relating to safe design requires clarification	OHS Authorities require programs to ensure that safe design initiatives already in the public domain are being complied with.
Programs of recognition and rewards	OHS Authorities and stakeholders should be encouraged to promote safe design through their awards and recognition programs.
Integrate safe design into Patent review process	NOHSC should consult with Patent review agencies to determine how safe design can be incorporated into the evaluation processes.
Promotion of current initiatives	Current initiatives that provide guidance on incorporation of safe design principles should be promoted to encourage their take-up at a national level.