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SAFE DESIGN

Risks can be eliminated or reduced by consulting with workers experienced in the task at the design stage or before purchase.

About safe design

As defined by the Australian Safety and Compensation Council (ASCC), *safe design is the integration of hazard identification and risk assessment methods, early in the design process to eliminate or minimise the risks of injury, throughout the life of the product being designed. It encompasses all design including facilities, hardware, systems, equipment, products, tooling, materials, energy controls, layout, and configuration* (ASCC, 2006, p. 5).

Safe design is very important to reducing the overall risk of musculoskeletal disorders from performing manual tasks at work. It results in both reduced risk of musculoskeletal disorders and more efficient ways to perform manual tasks. Conversely, poor design contributes to

the risk of musculoskeletal disorders and can result in inefficient work practices.

Examples of poor design that increase the risk of musculoskeletal disorders to workers undertaking manual tasks in mining workplaces include:

- completing work in awkward postures because of the location of the item (e.g. working on fixed plant that has impeded access);
- exerting high forces because of the design of the item (e.g. valves that require significant force to open and close);
- operating mobile plant in awkward postures because of the seating or cab layout, or both (e.g. seat position does not allow direct line of sight to work area);
- being exposed to excessive hand–arm vibration when using high-vibration hand-held tools (e.g. high-vibration power tool held over head without physical support).

Duties of designers, manufacturers and suppliers

The *National Standard for Manual Tasks* (ASCC, 2007) places a general duty of care on designers, manufacturers and suppliers of items, including buildings and structures used as a workplace where manual tasks are performed, to identify and eliminate, or reduce as far as reasonably practicable, the risk of a musculoskeletal disorder occurring

as a result of performing manual tasks at work.

Note: 'Items' includes plant, substances

and structures and may also include materials, fixtures, fittings, tools, equipment, machinery and electronic equipment.

Designers, manufacturers and suppliers of items must provide information so the product can be used safely, including:

- identifying any potential risk of musculoskeletal disorders that could not be designed out of the product; and
- advising how to use (i.e. installation, operation, maintenance, cleaning, transport, disposal) the product safely without risk of musculoskeletal disorders.

This must be updated whenever new information on manual tasks or aspects of the item, relevant to its use during manual tasks, becomes readily available. The information must be readily understood by those in control of the workplace and the workers who will use the item during a manual task.

Controlling musculoskeletal disorders risk through safe design

Eliminating hazardous manual tasks is the most effective risk control measure. It is generally cheaper, more practicable and more effective to eliminate hazards at the design planning stage rather than retrofitting or redesigning when the hazards become real.

Safe design supports a *collaborative risk management approach*. This means that, at the design stage, people with

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knowledge of each phase of the product, from design to use to dismantling, consult to identify problems and solutions. If possible, employers and users should to provide designers, manufactures and suppliers with information to assist them to achieve safe design.

When planning to build a new workplace building, structure or piece of equipment, employers should consult as early as possible with workers, and any safety and health representatives, to consider musculoskeletal disorder risks that may arise from manual tasks.

Similarly, it is important to consult and consider musculoskeletal disorder risks before purchasing new items such as plant, machinery, materials and fixtures. Whenever practicable, equipment trials should be arranged prior to purchase. Workers who will be using the equipment should be involved in the trials and given an opportunity to provide feedback. Formalising purchasing procedures to incorporate this process is highly recommended.

Pressure from consumers can have a powerful influence to 'upstream' safe design. Providing feedback to designers, manufacturers and suppliers is an important step to ensure ongoing improvements to safe design. This can be done on an individual basis or through industry

organisations and representative groups.

Further information

The ASCC's 2006 *Guidance on the Principles of Safe Design for Work* provides more information about the process of risk management at the design stage. The publication can be downloaded at www.ascc.gov.au

The *National Standard for Manual Tasks* provides information about duty holders in relation to safe design of manual tasks. The *National Code of Practice for the Prevention of Musculoskeletal Disorders from Performing Manual Tasks at Work* provides practical guidance on how to fulfil these obligations. Published by the ASCC in 2007, the standard and code of practice can be downloaded at www.ascc.gov.au

The handbook produced in 2007 from ACARP Project C14016 *Reducing Injury Risks Associated with Underground Coal Mining Equipment*, funded by the Australian Coal Association Research Program, provides information and guidance on risk assessment tools and examples of best practice associated with underground coal mining equipment. The handbook can be downloaded or purchased with accompanying DVD at www.burgess-limerick.com

A consultative approach to safe design has been developed through the Earth

Moving Equipment Safety Round Table (EMESRT), formally established in 2006 by a group of major mining companies from around the world. EMESRT aims to minimise safety and health risks by accelerating development and adoption of leading practice designs for earth moving equipment through a process of original equipment manufacturers and user engagement. Design philosophies for key issues that impact on the human factors design of earth moving equipment have been developed. The design philosophies and more information about EMESRT are available at www.mirmgate.com/emesrt.asp

References

Australian Safety and Compensation Council, 2006, *Guidance on the Principles of Safe Design for Work*: Australian Government, Canberra, 39 pp.

Australian Safety and Compensation Council, 2007, *National Code of Practice for the Prevention of Musculoskeletal Disorders from Performing Manual Tasks at Work*: Australian Government, Canberra, 127 pp.

Australian Safety and Compensation Council, 2007, *National Standard for Manual Tasks*: Australian Government, Canberra, 16 pp.