Safe Work Australia
Submission from Engineering. Systems. Management

Overview – Why we (E.S.M.) have information to offer to this review

E.S.M. has been studying and working with WHS legislated 'duties of designers' and related duties for more than six years.

We are a team of engineers, using our engineering expertise to help clients understand and implement 'safety in design', which is synonymous with:

- Lifecycle Safety
- Safe Design
- Engineered Safety
- Product Safety
- Design for Safety
- Safety by Design
- Safety through Design
- Prevention through Design (PtD).

Scope

This submission discusses opportunities for improvement to the model WHS laws with respect to duties of designers, and related duties that give-rise to safe outcomes through engineering. Broadly, we are commenting on these sections of the model Act: 18 to 28, 46, 47.

Background – Safety in Design

When Mike Hurd (Director, E.S.M.) first heard the term *"Safety in Design"* around 2009, it sounded like an excuse for not doing engineering properly in the first place.

Since then, Mike has studied the meaning and practical application of Safety in Design. His company have become specialists in this area. Mike is still convinced that **doing engineering properly in the first place** is the key to *"Safety in Design"*, nonetheless the term Safety in Design has stuck and so we need to work with it. Until all engineering organisations are indeed 'doing engineering properly in the first place', the term serves a purpose to draw attention to duties of designers, manufacturers, suppliers, importers etc.

'Safety in Design' (duties of designers, suppliers, manufacturers, etc.) is not being applied consistently throughout Australian industry. There is opportunity for improvement.

Key Observation

We see organisations trying to apply a Risk Ranking approach to Safety in Design (safe design), applying something along the lines of the following set of steps (summarised):

1. Identify Hazard (or Risk): This often results in a mix of risks, hazards, causes and consequences.
2. Apply Risk Ranking.
3. List Existing Controls: Not always useful in a context of engineering decision-making.
4. Re-Rank Risk with Controls: this should result in design changes.
5. Identify other action required to *"reduce the risk"*: Usually, by this step, the person, or group, has already *"bought-in"* to living with (tolerating) the potential source of harm. The opportunity to amend the design was just lost!

We see this approach (the above five steps) often failing, because it is dealing with risks (intangible) and subjectivity (opinion, experience and preference-based outcomes and discussion), with often discordance and disagreement. We believe that risk-related terminology used throughout Model WHS Laws may contribute to the use of this approach.

We promote and apply the following approach, which we believe is the intended outcome of the Act and related Codes of Practice and Guides (in particular: Code of Practice, safe Design of Structures; guide to the Safe Design of Plant; Principles of good work Design; Code of Practice Construction – Appendix C). We believe that SAFE DESIGN can be achieved via this process (noting that for engineering and design, there is a lot of detail wrapped-up in each of these steps):

1. Identify **Hazards.**
2. Apply the Hierarchy of Controls.
3. Agree which control measures are Reasonably Practicable to implement.
4. Implement control measures.
5. Keep records of decisions.

Experientially, this leads to more objective thinking, better focus on hazards, better application of the hierarchy of controls, more harmony, accord, innovation, confidence.

Opportunities for improvement – Model WHS Legislation

No.	Opportunity for Improvement	Note
ESM1	Re-word sections to promote the key difference in mind-set between proper 'safe design' and 'risk ranking'	The process for designing something safe SFAIRP is: 1. identify hazards; 2. apply the hierarchy of controls to each, 3. Implement agreed reasonably practicable actions.
ESM2	Promote terminology that reflects: safe design is not only the prerogative of DESIGNERS.	As an emerged and uncontrolled/unregulated term, Safety in Design has become (in some peoples' minds) the prerogative of DESIGNERS, which is wrong: it is the prerogative of **anyone** who makes a decision about design. Lifecycle Safety or Engineered Safety are better terms, because it takes the focus off the designers and onto the engineering lifecycle. Note: Workers in general can also contribute to safe design; by communicating identified design improvements or ideas for new design / innovation to improve safety within their work areas.
ESM3	Reasonably Practicable: clarity required	The legislation needs to be clear that it is concerned with what is Reasonably Practicable. The term SFAIRP and in WA SFARP are not acronyms in the true sense of the meaning of acronym; they are abbreviated terms that have confused things. It will be an excellent outcome if the legislation can make this clear. People have adopted the terms *"SFAIRP"* and *"SFARP"* without understanding what they mean. Clarity is required, nationally.

No.	Opportunity for Improvement	Note
ESM4	Eliminate Hazards. Not Risks. **DEFINE 'HAZARD' AND 'RISK'.**	Throughout the legislation and associated codes, statements such as these: *"(a) to **eliminate risks** to health and safety, so far as is reasonably practicable, and* *(b) if it is not reasonably practicable to eliminate risks to health and safety, to minimise those risks so far as is reasonably practicable."* **SHOULD BE CHANGED TO THIS:** *"(a) to **eliminate HAZARDS** to health and safety, so far as is reasonably practicable, and* *(b) if it is not reasonably practicable to **eliminate HAZARD/S** to health and safety, to minimise **THE ASSOCIATED RISK** so far as is reasonably practicable."* Another example: *"The designer must ensure, so far as is reasonably practicable, that the plant, substance or structure is **designed to be without risks** to the health and safety of persons:"* Ideally, THIS SHOULD READ: *"The designer must ensure, so far as is reasonably practicable, that the plant, substance or structure is **designed to be without HAZARDS. For hazards that cannot be eliminated, the risk associated with hazards should be reduced SFAIRP** to ensure the health and safety of persons:"* The legislation needs to be clear that you **CANNOT ELIMINATE RISK.** You can only eliminate an individual risk by eliminating a hazard, and even then, there is always 'risk' sitting behind it. This is clear from the definitions: Hazard: Potential source of harm, which is a tangible thing that can be understood and have the hierarchy of controls applied to it. By experience, this leads to more objective discussions, harmony, accord and defensible outcomes. Risk: Uncertainty on Outcomes, which is intangible, more subjective, and gives-rise to more subjective and less-defensible outcomes. **THE LEGISLATION DOES NOT CLEARLY DEFINE THE TERMS *"HAZARD"* AND *"RISK"*. THIS IS FUNDAMENTAL.** The AS 31,000 definitions are useful, noting that AS 31,000 is not a 'safe design standard' – it is a risk management standard.

No.	Opportunity for Improvement	Note
ESM5	CoP Safe Design of Structures 'leap of faith' between hazard identification and risk-ranking	The CoP Safe Design of Structures is an excellent document and the best guide we have come across regarding safe design. However, it makes the 'leap of faith' between hazard identification and risk-management. Safety decisions should primarily be made based on whole-of-asset-life costs versus whole-of-life benefits (see UK RSSB document here); these are objective measures about whether a measure to address a hazard in accordance with the hierarchy of controls is reasonably practicable. The CoP could be written without mentioning risk, and only mentioning hazard identification and applying the hierarchy of controls. That is more tangible, more objective.
ESM6	They interplay between people, tasks and hazards	A focus on people, tasks and the interface between people and a design (designed product) is something that the Act, Regulations and CoP are lacking. Focus on people and tasks (end users), then hazards.
ESM7	Use of the term 'like-for-like'	The term like-for-like is often misused to mean 'functionally the same' or 'functionally similar'. This results in new-for-old equipment being installed without due attention to all design changes from the original and without proper engineering assessment. The use of the term is quite common; and is itself hazardous. Could the Regulations or CoP mention how the term 'like-for-like' is itself hazardous when making design decisions?
ESM8	Add a Regulation for design change control and verification and validation	The absence of design change control and verification and validation are the root-cause of many incidents, injuries and fatalities. This includes design of products, equipment, plant, assets, etc. as well as work-places and work methods.
ESM9	Re-title the CoP Safe Design of Structures to *"CoP – Safe Design"*, and remove references to buildings and structures	The CoP is an excellent guide to safe design for all disciplines, not only for structures.
ESM10	Update the WA CoP Safe Design of Structures to match the SWA one.	The WA CoP Safe Design of Structures is out of date, and following it is less-likely to result in designs that are safe SFAIRP compared with using the SWA version.

No.	Opportunity for Improvement	Note
ESM11	Amend wording in the Act Section 18 and CoP to convey that safety decisions should be made based primarily on whole-of-life cost-benefit analysis	Aim to convey how safety decisions can/should be made in this order: Whole-of life cost-benefit analysis If that doesn't give the answer, are there other engineering decision-making tools required (e.g.: quantitative risk analysis, semi-quantitative risk analysis) to compare costs of measures with business turn-over (capacity to pay)? If you still don't have an answer, find out what other, similar business are doing in order: state, nationally, internationally If you still don't know the answer, use risk ranking, according to corporate risk tolerability guidance, to assist making RECOMMENDATIONS – not decision. The Act, Section 18 and CoP have somehow given the wrong impression; that safety decisions should be made based on risk ranking, which is incorrect and less likely to result in safe design.

End submission.