

Panel Session – Safety in design

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Slide 2 – Regulatory functions

NOPSEMA is Australia's national independent regulator for the offshore industry and was formed following recommendations from the Productivity Commission (2009) and the Montara Commission of Inquiry (2010). NOPSEMA's functions can be considered as addressing three key areas:

Compliance

- To develop and implement effective monitoring and enforcement strategies so that industry complies with the law.
- To investigate accidents and occurrences relating to occupational health and safety (OHS), well integrity and environmental management.

Promotion

- To promote the safety of people working offshore.
- To advise on matters relating to OHS, well integrity and environmental management.

Governance

- To provide reports, including recommendations, to the Commonwealth/state/NT minister.
- To cooperate with other agencies or authorities.

Slide 3 – NOPSEMA's coverage

NOPSEMA succeeded NOPSA. NOPSA was formed in 2005 and was responsible for occupational health and safety regulation. In April 2011, in response to significant offshore accidents, namely the PTTEP AA Montara Blowout in the Timor Sea in 2009 and BP Macondo blowout in the Gulf of Mexico in 2010, NOPSA's regulatory coverage was increased to include structural (well) integrity. As of 1 January 2012 NOPSA became NOPSEMA, the National Offshore Petroleum Safety and Environmental Management Authority, responsible for the regulation of safety, well integrity and environmental management of offshore oil and gas activities in Commonwealth waters.

Slide 4 – NOPSEMA's jurisdiction

NOPSEMA's jurisdiction is in Commonwealth waters and also where a state or territory has conferred functions to regulate OHS, well integrity or environmental management. At the moment, the only conferrals in place are for Victoria with respect to safety and structural integrity regulatory functions.

Slide 5 – Legislation administered by NOPSEMA

NOPSEMA administers:

- *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA)
- 'Schedule 3' of the OPGGSA – OHS Law
- Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009
- Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011
- Offshore Petroleum and Greenhouse Gas (Environment) Regulations 2009

- Please note s640 of the OPGGSA states that Commonwealth maritime legislation does not apply in relation to facilities

Slide 6 – Legal framework (OHS)

NOPSEMA regulates what can be characterised as a ‘General Duties’ regime that is performance based with some prescriptive elements. The regime features an independent regulator (NOPSEMA) who reports directly to the Commonwealth Minister for Resources and Energy.

The performance based duty (on the operator of a facility) is to take all reasonably practicable steps to ensure the facility and activities conducted at the facility are safe and without risk to the health of any people at or near the facility. Examples of prescriptive elements include contents requirements for a safety case and some OHS exposure standards.

A facility operator’s safety case is used as a permissioning document, i.e. must be accepted in order to undertake activities.

Slide 7 – Safety case life-cycle

This diagram represents the life-cycle of a safety case from the nomination of an operator for a facility, to the acceptance of a safety case, to a range of triggers for revision, through to exiting the regime. I’d suggest the life-cycle is comparable to similar regimes elsewhere, however, I’d like to draw your attention to the validation aspects which are certainly different from the likes of the UK safety case regime.

Slide 8 – Validation

Validation is an assurance activity that may be requested by NOPSEMA as per Regulation 2.40 of the OPGGS (Safety) Regulations. Validation has three distinct components:

Scope of validation

A scope of validation should include:

- An overview of facility/modification and process for Safety Critical Element (SCE) selection
- The codes and standards selected for SCE
- A description of the validator selection process
- Clarity with respect to including a view about the appropriateness of codes and standards selected
- Deliverables
- Agreed with NOPSEMA

Validation activity

- The independent, competent review of data and information provided by the operator

Validation statement

Key features of a validation statement:

- Codes and standards are appropriate
- If codes and standards are applied the facility will incorporate measures to protect health and safety
- Consistency with formal safety assessment
- A part of the acceptance criteria for a safety case is the consideration of a validation statement



Validation, as referred to in the legislation, should not be confused with verification. Verification generally requires someone to check, for example, that safety-critical equipment has been installed correctly and is fit for its function and use.

The inclusion of elements of verification within a validation scope is potentially problematic, particularly for fixed facilities. For example, verification that a piece of safety-critical equipment is fit for its function and use often can only be conducted once the equipment has been installed. However, this equipment cannot be installed until a safety case, which provides for the installation of equipment, has been accepted by NOPSEMA. Any acceptance of a safety case related to such a proposed modification to a facility can only occur if the operator has provided a suitable validation statement as part of the safety case assessment process. Consequently, verification is a separate and distinct process from validation and generally should be addressed within the safety case for the facility rather than coupled with validation.

Regulations on safety case contents requirements, such as Regulation 2.12, 2.14(2), 2.18 and 2.22(3), detail verification requirements that must be addressed in the safety case for a facility. Validation is a separate assurance process, provided for by the regulations and tied to safety case decision-making. It is essentially a three step process. For more information please refer to NOPSEMA's [Validation Guideline](#).

Slide 9 – The safety case

The other aspect of the lifecycle I would like to touch on is the safety case itself.

Slide 10 – Safety case contents

In the same way with comparable regimes elsewhere, a safety case in the OPGGS (Safety) Regulations comprises of a facility description, formal safety assessment (FSA) description and a safety management system description. Notably a safety case essentially describes a process with the FSA at its heart. A critical output of the FSA is the identification of technical and other control measures necessary to reduce the level of risk to as low as reasonable practicable. Noting that the notion of reasonable practicability is also central to the general duties I'd like to explore this further for clarity.

Slide 11 – Reasonable practicability

The construct of reasonable practicability is concerned with weighing up the size of the risk against the cost of prevention. A risk reduction measure can be considered as being reasonably practicable if the cost to implement it is not grossly disproportionate to the reduction in risk achieved.

Reasonably practicable was legally defined in England by Lord Justice Asquith in *Edwards v National Coal Board* [1949] who said:

Reasonably practicable' is a narrower term than 'physically possible' and seems to me to imply that a computation must be made by the owner, in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other; and that if it be shown that there is a gross disproportion between them — the risk being insignificant in relation to the sacrifice — the defendants discharge the onus on them. Moreover, this computation falls to be made by the owner at a point of time anterior to the accident.

This definition has since been confirmed by the Australian High Court - *Slivak v Lurgi (Australia) Pty Ltd* (2001) 205 CLR 304 cited in *Bluff & Johnstone* (2004) *The relationship between Reasonably Practicable and Risk Management* (WP 27 ANU National Research Centre for OHS Regulation).

Slide 12 – As low as reasonable practicable (ALARP)

ALARP, in a broader lifecycle context, highlights that key decisions made in relation to concept selection, design and subsequent field activities effectively constrain what is reasonably practicable going forward.



Key choices made, including concept selection and design, should involve consideration of ALARP with respect to risks relating to all potential major accident events (MAE).

Slide 13 – Early engagement

With the previous diagram in mind early engagement is a process intended to provide structured dialogue between NOPSEMA and an operator of a proposed facility early in its lifecycle.

Early engagement applies to proposed facilities, not yet being constructed, that involve the use of new technologies, or new combinations or applications of existing technologies.

The objectives of the submission and assessment of an early engagement safety case are:

- to realise potential benefits to the workforce, in terms of lower risk, of early regulatory engagement with an operator of a proposed facility;
- to provide a facility operator with a mechanism for regulatory risk mitigation prior to making a final investment decision or commencing detailed design; and
- to provide NOPSEMA with the opportunity to challenge an operator's concept selection, design and consideration of inherent safety at an appropriately early stage in a facility's lifecycle.

Slide 14 – Timing

On the basis that the primary objective of early engagement is to realise potential benefits to the workforce in terms of lower risk, timing is the critical factor. The more time that passes the more we see a rapid rise in the cost to make changes to a facility and as a consequence a diminishing window of opportunity to incorporate inherent safety features.

Slide 15 – Future directions

NOPSEMA continues to work with the Department of Resources, Energy and Tourism to have a design notification style scheme incorporated into the legislation. The key focus would be on concept selection and design. It is envisaged that it would be a requirement for proposed production facilities and would provide the basis for ongoing dialogue, transitioning into submission of a safety case.

Slide 16 – Industry leadership challenge

Inherent safety is an industry leadership challenge as it can deliver safer facilities that are simpler to operate and maintain with a lower total cost of ownership. Leadership, capability and vision are needed at all levels to shape and support an organisational culture that embraces and values inherent safety.

Consider what would be different in your organisation if you were to embed inherent safety as a key risk management approach. At the very beginning of any new project, task or change, people at all levels would challenge:

- How can we eliminate hazards at their source?
- What could be made simpler?
- How can we avoid the need for additional complexity?
- How can we ensure the system fails safe?

Could this result in a longer cultural change to an organisational predisposition to design simpler and safer facilities that are easier for people to maintain and operate and would, without human intervention, fall into a safe state?

- It is fundamentally focused on prevention and minimisation of escalation rather than mitigation and consequence minimisation.

- It questions complexity and values simplicity.

Embracing and valuing inherent safety entails organisational realignment to ensure:

- early application, i.e. starting with concept evaluation; and
- a focus on minimising hazards at their source rather than mitigating consequences;

Slide 17 - Resources

NOPSEMA's website provides a range of resources to assist operators with understanding the legislative requirements around operator nomination, validation and safety cases. The NOPSEMA website contains a range of policies, guidelines and guidance notes addressing these topics and we encourage operators and potential operators to make good use of the resources available.