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Better Practice Forum

26 September 2023

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Agenda

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Early morning tea and coffee

- Welcome
- Acknowledgement of Country
- Housekeeping
- Welcome from Sue McCarrey, CEO NOPSEMA

- **A Regulatory Perspective on the Management and Oversight of Offshore Safety Risks**
- **Assuring Offshore Structural Integrity: A 'Life Cycle' Approach**

Morning tea

- **Well Integrity Risk Associated with the Management of Change**
- **Unveiling Neglected Risks: Enhancing Operational Safety Risk Assessment and Mitigation**

Lunch

- **Welcome back**
- **Panel session and Audience Q&A with NOPSEMA's Environment Leadership** Cameron Grebe, head of Environment, Renewables and Decommissioning Division
    - Nicola Brischetto, acting Production Coordinator,
    - Raquel Carter, Chief Environmental Scientist

Afternoon tea

- **Cont. - Panel session and Audience Q&A with NOPSEMA's Environment Leadership**
    - Cameron Grebe, head of Environment, Renewables and Decommissioning Division
    - Nicola Brischetto, acting Production Coordinator,
    - Raquel Carter, Chief Environmental Scientist

Wrap up and farewell

A Regulatory Perspective on the Management and Oversight of Offshore Safety Risks

Rod Gunn, acting Head of Division, Safety and Integrity

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NOPSEMA's Jurisdiction

Offshore Activity Q1 2023

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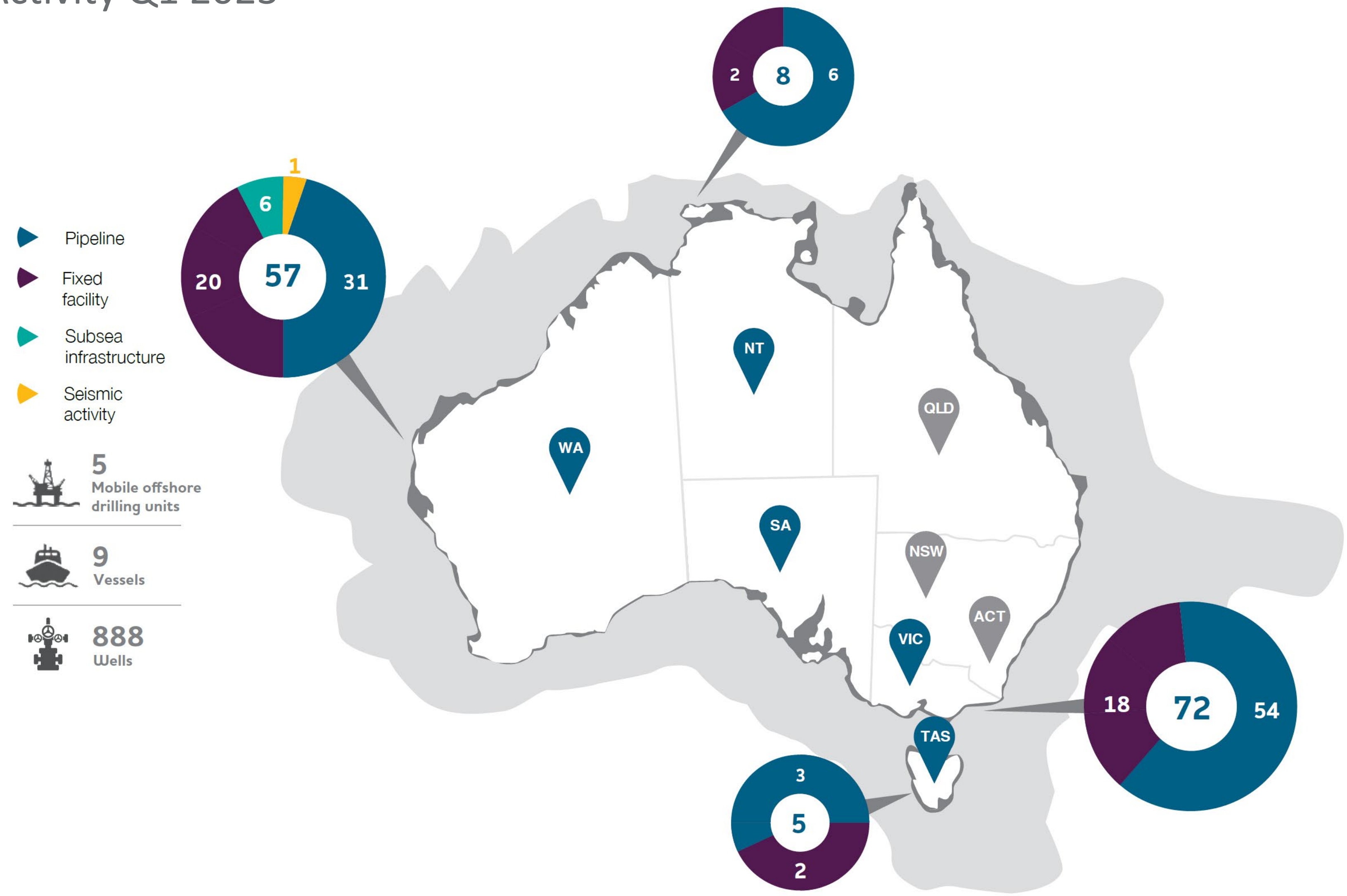
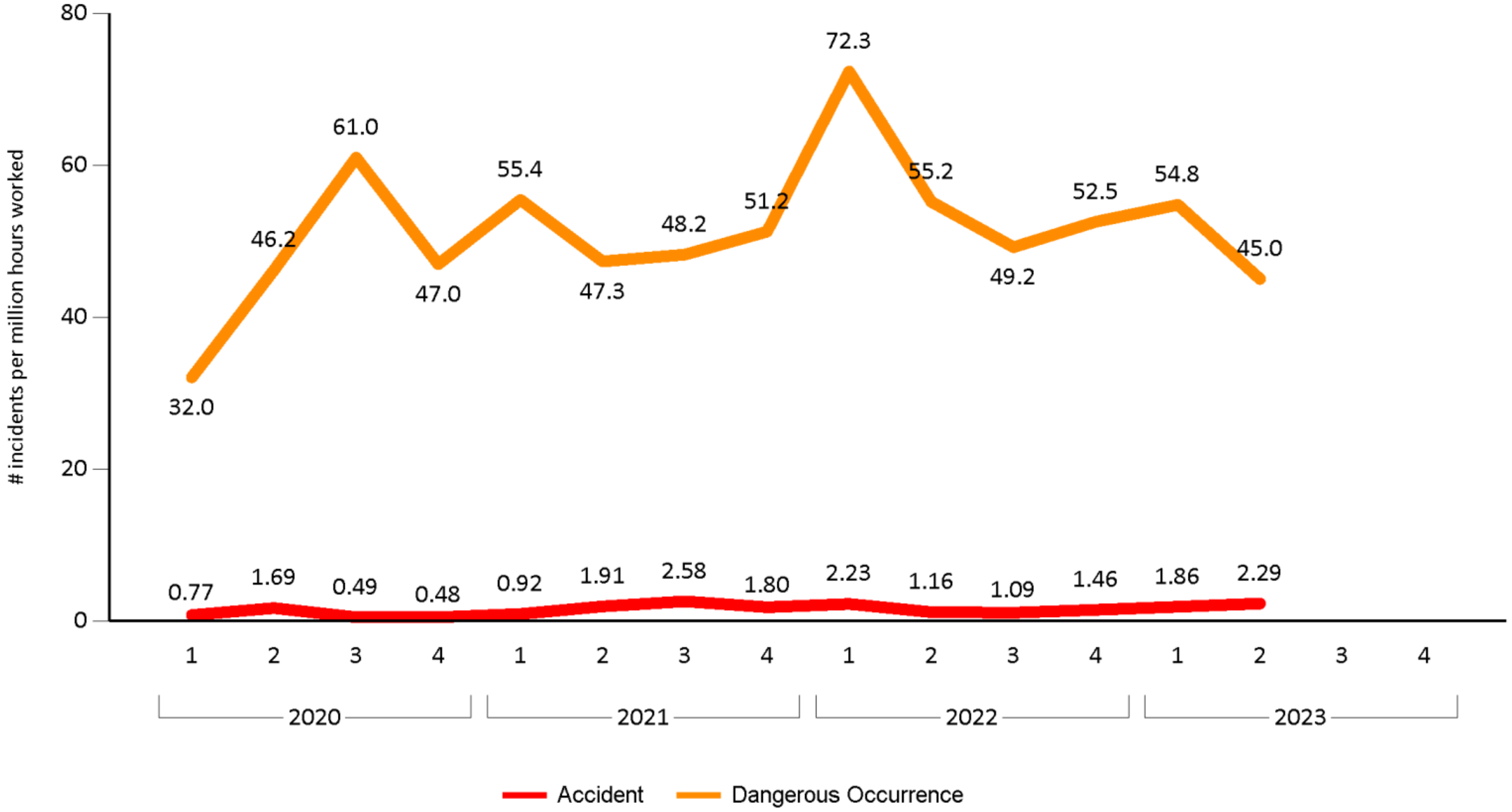


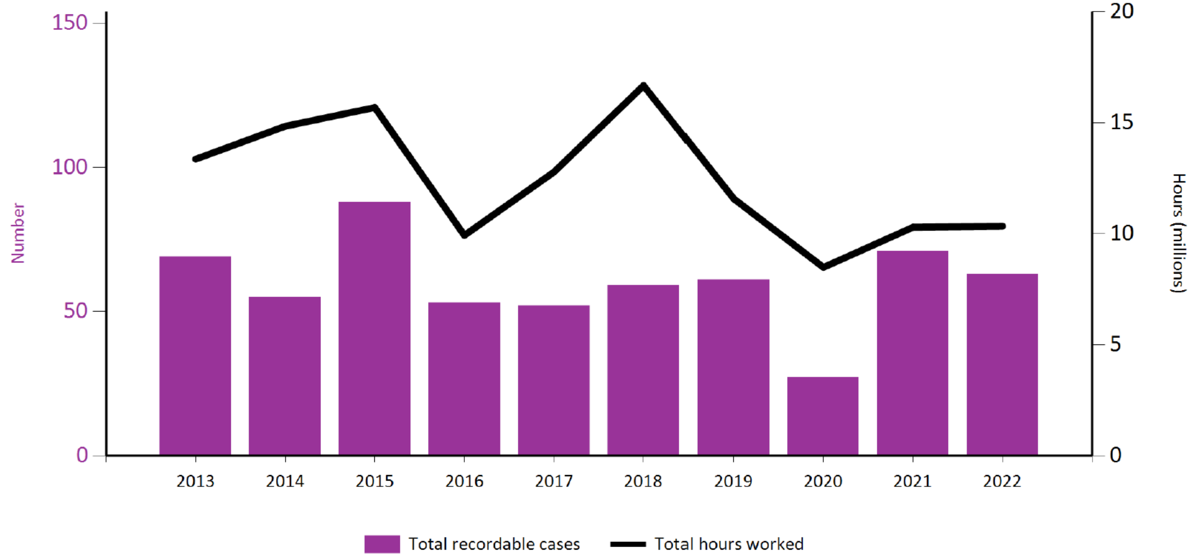
OHS Incident Rates Per Quarter



**Note: final total offshore hours (used as a normaliser to calculate incident rates) for the current reporting quarter will not be available until after the 15th day of the following month (operator deadline for submission)*

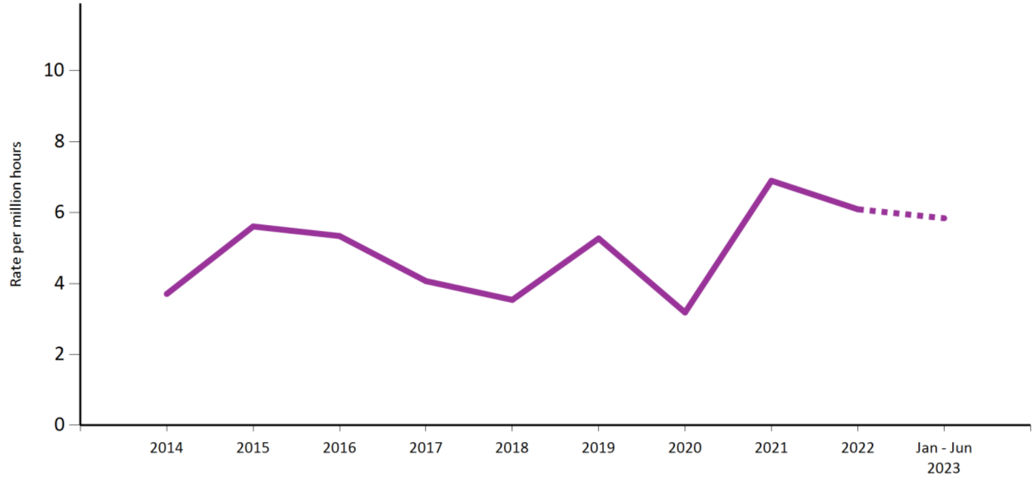
Metrics

Injuries - Total recordable cases (TRCs)



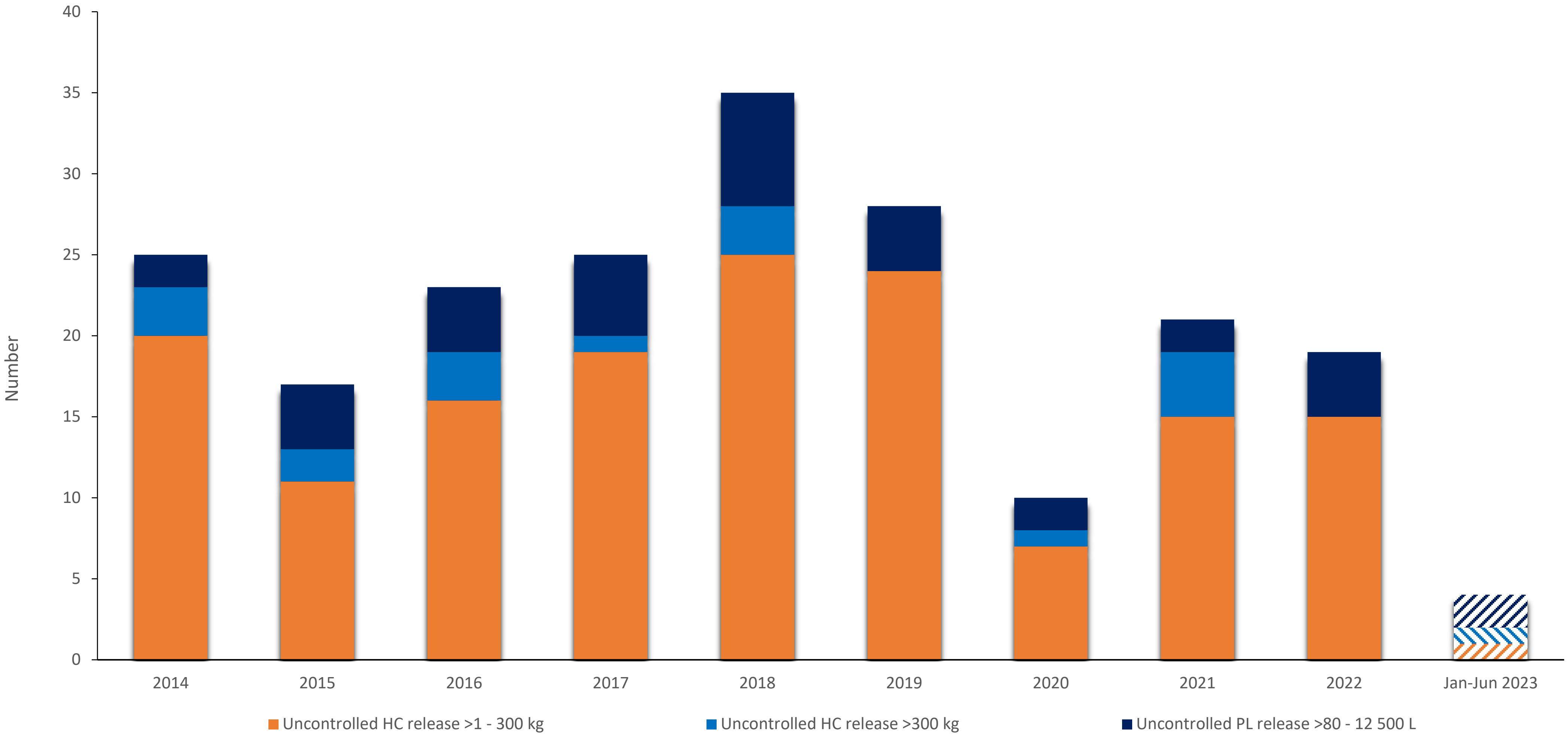
Note: Total recordable cases is the sum of fatalities, major injuries, LTIs (lost time injuries), ADIs (alternative duties injuries) and MTIs (medical treatment injuries)

Total recordable cases (TRCs) - injury rates



Note: Total recordable cases is the sum of fatalities, major injuries, LTIs (lost time injuries), ADIs (alternative duties injuries) and MTIs (medical treatment injuries)

Uncontrolled hydrocarbon releases



Note: Hydrocarbon releases may have been reported as an OHS, environmental and/or well integrity incident; this chart only includes those notified under OHS reporting criteria.

Dangerous occurrences

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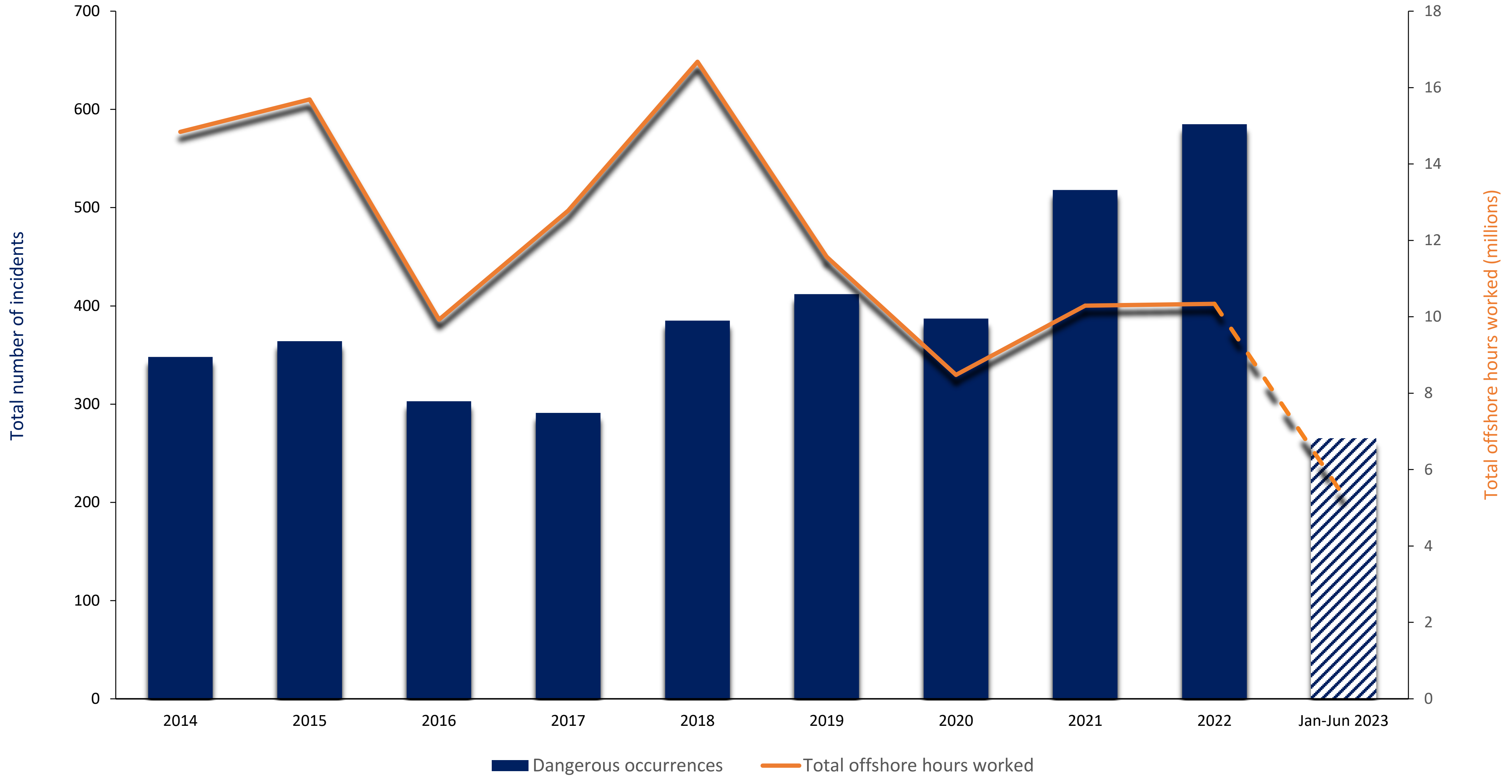

Compliance history

NOPSEMA's regulatory approach and compliance activities are designed to ensure a safe offshore workforce, structural and well integrity and the effective management of any impact to the environment. While addressing risk gaps is the focus of our approach to compliance monitoring, the compliance history of regulated entities is a factor that may be considered.

We are focused on driving continuous improvement to a point of consistent, intentional compliance, as well as a safe, and environmentally conscious regulated community. The Compliance History Matrix gives an indication of how we may decide to monitor and enforce compliance after considering risk gaps and compliance history of the individual or organisation.

Table 1: Compliance History Matrix*

Compliance History	Status	Attitude / Behaviour	Indicative Approaches	Tool
Excellent	Intentional compliance	• Compliance oriented • Pro-active with robust governance systems • Willing • Attentive	• Guidance • Support • Encouragement • Monitor	• Engagement • Information collection • Compliance reporting • Routine inspections
	Unintentional non-compliance	• Generally compliance oriented • Attempting to comply with developing governance systems • Tries but does not always succeed • Unintentionally negligent	• Support compliance • Educate • Influence • Monitor • Feedback and recommendations	• Proactive engagement • Workshops • Routine inspections • Audits • Notices
	Opportunistic non-compliance	• Not motivated toward compliance • Complies when/where convenient with minimal self-governance • Resistant • Negligent	• Deter non-compliance • Actively monitor • Oversee • Correct behaviour	• Proactive monitoring • Targeted inspections • Notices • Directions • Infringements
Poor	Intentional non-compliance	• Tends to non-compliance • Deliberate compliance avoidance no self-governance • Disengaged • Illicit behaviours	• Enforce the law • Direct • Pursue conviction	• Investigation • Directions • Prosecution

* **Note**: This matrix displays examples only and is not an exhaustive list.
NOPSEMA is not bound by the approaches or tools listed in the matrix when deciding the most appropriate compliance monitoring or enforcement options.

Regulatory approach – Exemplar –world best practice

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- NOPSEMA focus on driving continuous improvement
- Intentional compliance:
  - Compliance oriented
  - Pro-active with robust governance systems
  - Willing
  - Attentive

Compliance Strategy 2023

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ELEMENT FIVE	ELEMENT SIX	ELEMENT SEVEN	ELEMENT EIGHT
Encourage intentional compliance.	Deter and address non-compliance.	Provide regulatory expertise and advise on policy development and improvement.	Continuously improve regulatory capability and capacity within NOPSEMA.
• recognise and promote exemplars of intentional compliance • reduce regulatory burden where appropriate, guided by the compliance history matrix	• increase regulatory oversight and direction, guided by the compliance history matrix • use regulatory powers to cease non-compliance and / or return an activity to compliance • publicise enforcement outcomes	• engage and maintain relationships with relevant ministers and government agencies • foster and maintain collaborative relationships with national and international regulatory agencies • present and participate in conversations of regulatory excellence in Australia's offshore energy sector • regularly report on the performance of NOPSEMA	• appropriately allocate levies to maintain adequate NOPSEMA resources • invest in NOPSEMA's workforce development and retention of sector wide expertise • invest in systems and processes to maintain and exceed currency and competence expectations • foster continuous improvement culture across NOPSEMA
Promotion, Advice and Engagement **Compliance Monitoring**	**Compliance Monitoring** **Enforcement** **Promotion, Advice and Engagement**	**Promotion, Advice and Engagement**	**Continuous Improvement**

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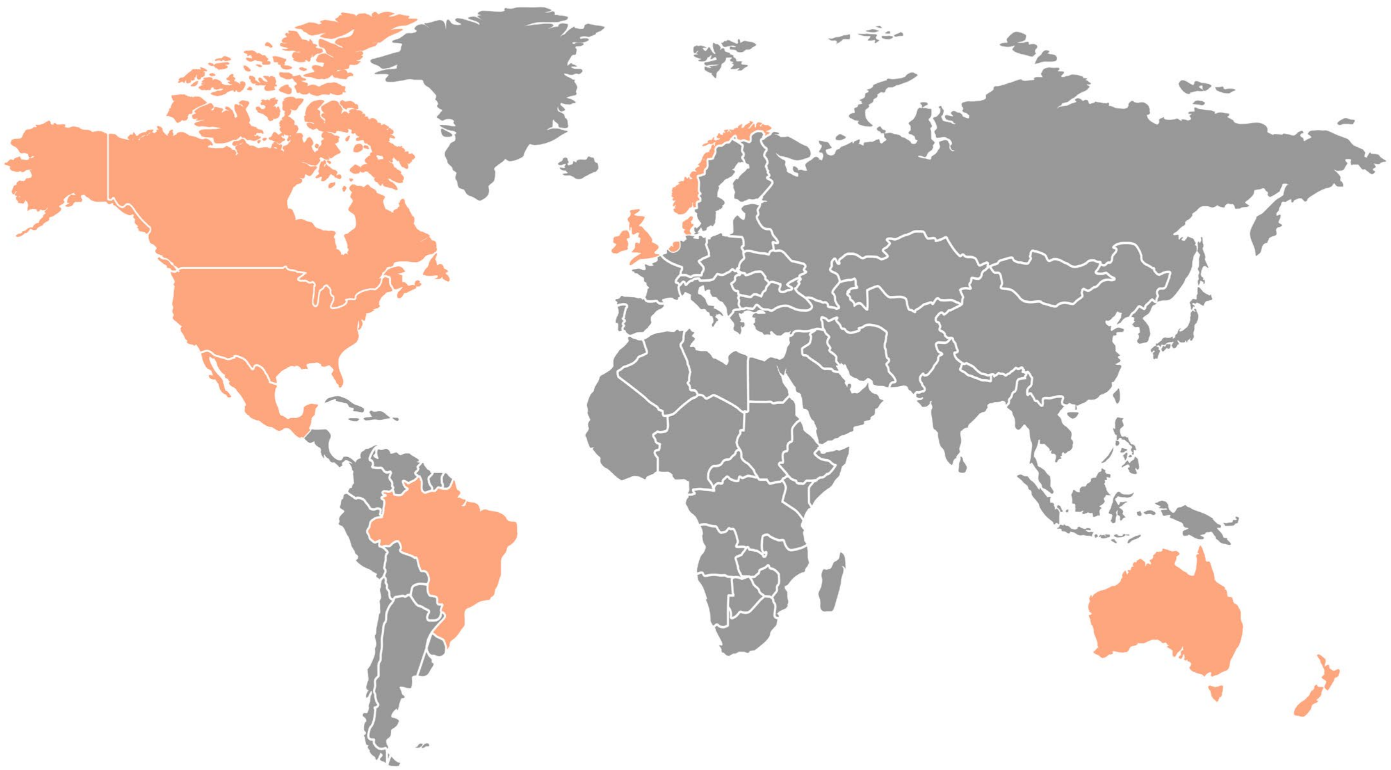
Improved Engagement



anp
Agência Nacional do Petróleo, Gás Natural e Biocombustíveis
ASEA
AGENCIA DE SEGURIDAD ENERGÍA Y AMBIENTE
Arbejdstilsynet
BSEE
Bureau of Safety and Environmental Enforcement
Canada Energy Regulator
Régie de l'énergie du Canada
CANADA-NEWFOUNDLAND & LABRADOR
C-NLOPB
OFFSHORE PETROLEUM BOARD
CNSOPB
CANADA-NOVA SCOTIA OFFSHORE PETROLEUM BOARD
CRU
An Coimisiún um Rialáil Fóntais
Commission for Regulation of Utilities
Department for Business, Energy & Industrial Strategy
HSE
Health & Safety Executive
NOPSEMA
PETROLEUM SAFETY AUTHORITY NORWAY
Staatstoezicht op de Mijnen
Ministerie van Economische Zaken
WORKSAFE
NEW ZEALAND | MAHI HAUMARU AOTEAROA

Preventing Major Accident Events

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Perspectives on risk

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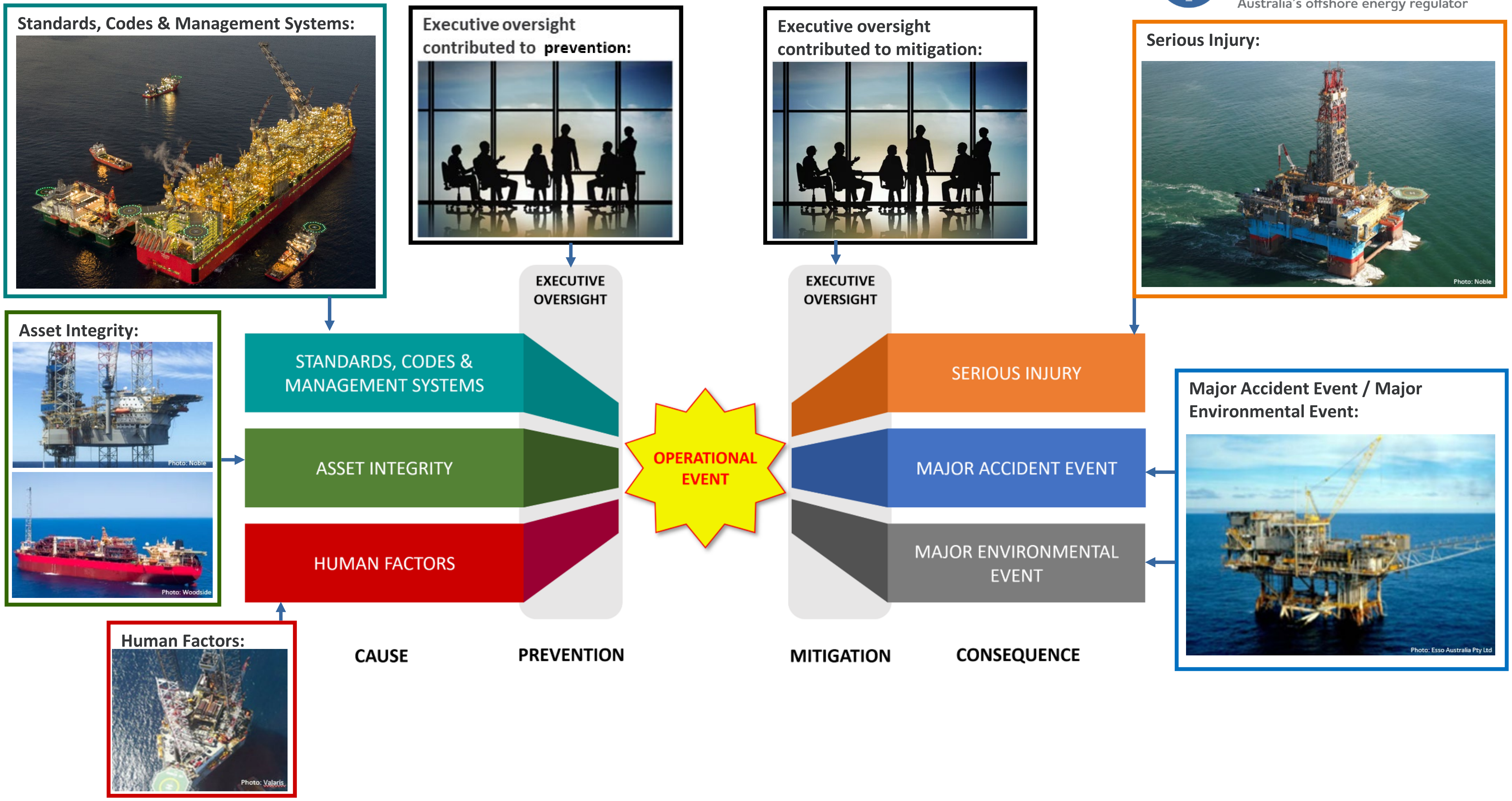

Executive Management oversight (Understanding) safety risks

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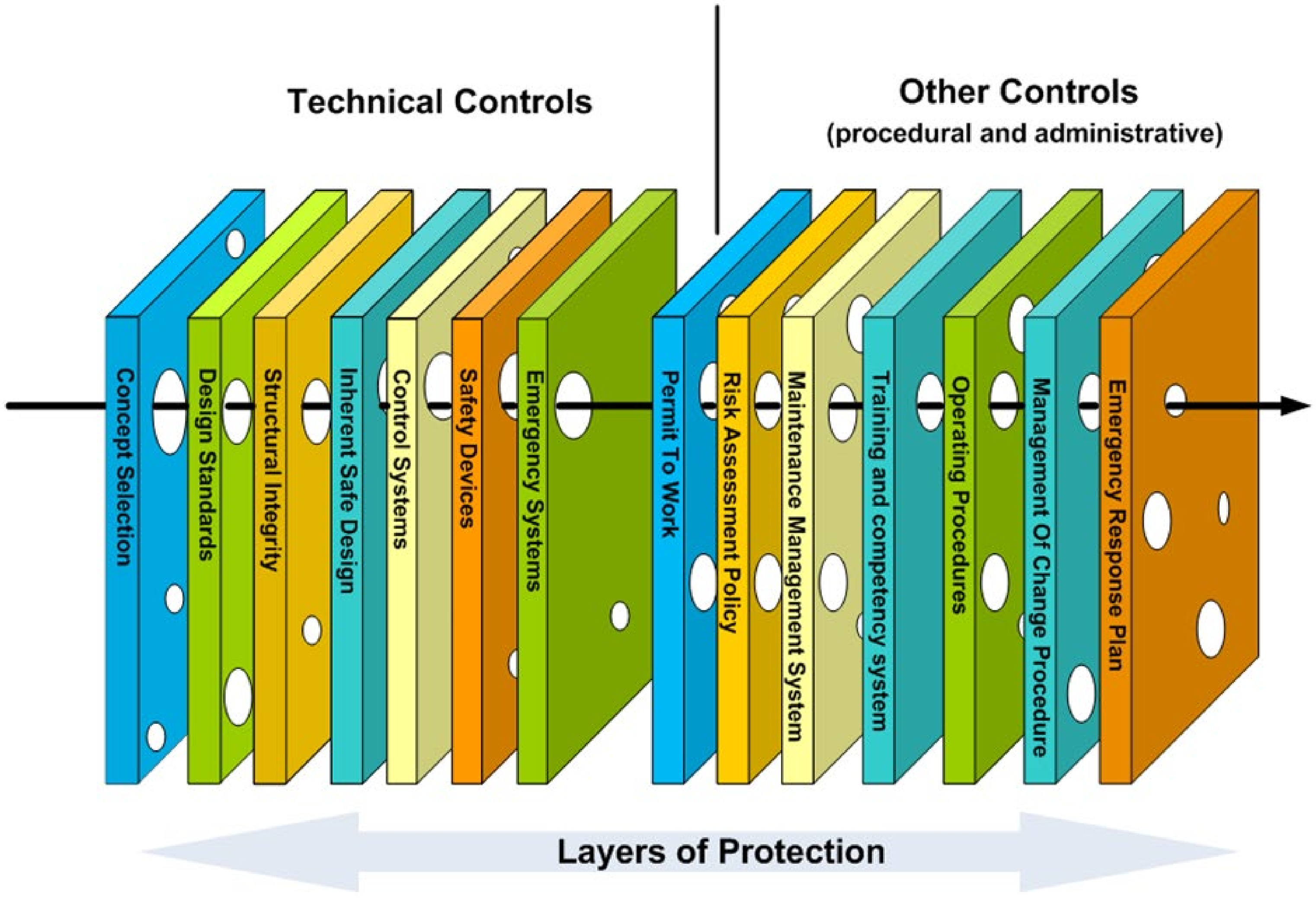

Executive Oversight & Accountability

Are executive decisions supporting or undermining a positive safety culture?

Psychosocial hazards:

- Time pressure or role overload
- Emotional demands
- Interpersonal or team conflict (including bullying, violence and aggression)
- Change (management of change)
- Environmental conditions
- Job control/autonomy
- Co-worker and supervisor support
- Organisational injustice
- Recognition and reward (contractual arrangements)

Risk management for psychosocial hazards:

- Analysis of organisational data (e.g. absenteeism, incident/injury data, use of employee support programs)
- Assessing worker complaints or hazard reports
- Observation of the workplace, work practices, and human interactions
- Use of worker surveys and/or focus groups, HSERs
- Examination of data from the industry or sector, or other similar work environments

Asset Integrity & Maintenance

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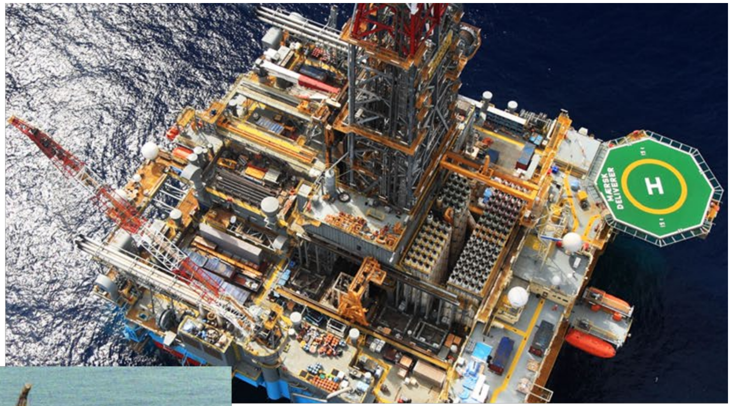


Risk Based Inspection:

- Compliance with permissioning documents (WOMP / SC / EMP)
- Asset Integrity – new and ageing assets
- Well Integrity
- Timely identification and remediation
- Maintenance Management
- Compliance with performance standards
- Control of work (PTW / WMS / MoC)
- Workforce competency
- Contractual arrangements, etc.

Decommissioning

Section 572 of the Act requires titleholders to:
maintain all structures, equipment and property in a title area in good condition and repair so that they be removed; and
remove these when no longer being used in connection with operations authorised by the title.

Section 270 of the Act requires NOPSEMA to be satisfied that titleholders have removed all property brought into the surrender area prior to surrender of a title. This includes plugging and abandoning wells, providing for the conservation and protection of natural resources; and making good any damage to the seabed or subsoil to NOPSEMA's satisfaction. As such consideration of this end-stage criteria is critical for titleholders to be planning towards from the outset.

Human Factors

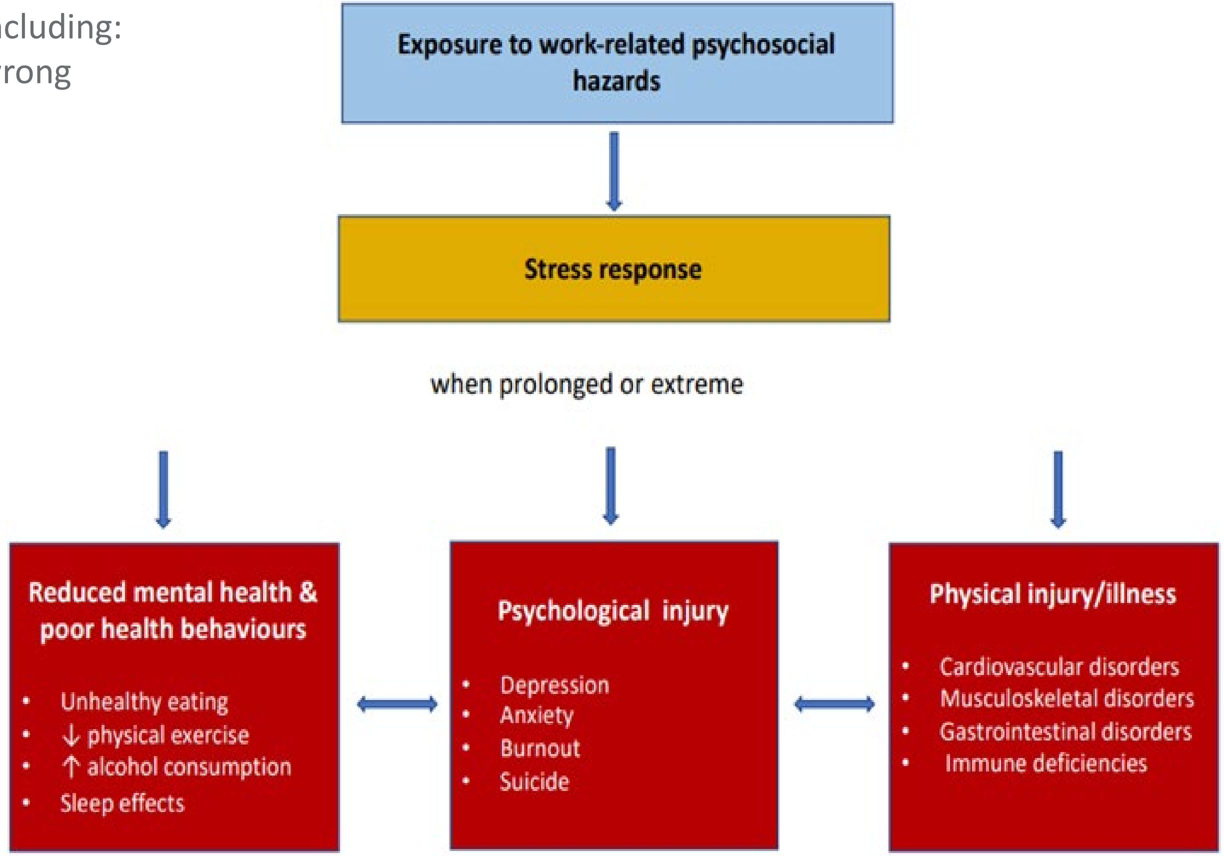
Human Factors play a major role in OHS incidents and in the management of process safety.
An understanding of human factors and organisational impact on human behaviour and response is vital in considering modes of failure; this approach is quite different to a focus on humans as the source or problem of the error.

Kletz (2001) identifies 'errors' in engineering and process safety events, including:

- **Simple slips** (e.g. forgetting to open/close a valve, calculation error, wrong connection, failure to notice)
- **Errors related to training or instructions**
- **Failure to follow instructions**
- **Errors in design and/or construction**
- **Maintenance errors**
- **Operational and communication errors**
- **Errors in computer controlled plants**
- **Errors related to management environment**

However, Kletz (2001) challenges the value of talking about human error as a cause and suggests focusing on the action required to prevent the 'error' occurring.

Rather than focusing on allocating blame, Dekker (2006) advocates finding out "how people's assessments and actions made sense at the time, given the circumstances".



Visual representation of the causal flow from psychosocial hazards to health and safety outcomes with reference to key OHS terminology. [Source: The OHS Body of Knowledge – Chapter 19]

Assuring Offshore Structural Integrity: A 'Life Cycle' Approach

Percy Dhanbhoora, acting Manager, Assessment & Inspection, Platforms, Pipelines & Diving team

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Introduction and overview

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- Whole of life asset management
- What is Structural integrity
- All Assets are Ageing
- Australia's offshore Oil & Gas Landscape
- Legislative basis
- Regulating Structural Integrity
- Learnings, Key Issues, Good Practice
- NOPSEMA – Initiatives underway
- Questions?

Whole of Life Asset Management

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Vision

Management of structural integrity of offshore petroleum wells, structures and property is conducted in a timely, safe, and environmentally responsible manner ***throughout the facility life cycle.***

NOPSEMA's Expectation

Australia's regulatory system requires duty holders to ensure that risks associated with structural integrity as defined by OPGGS 2006 Act are ***understood, addressed, and methodically managed*** to ensure they are as low as reasonably practicable (***throughout the facility life cycle).***

What is Structural Integrity?

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Structural Integrity is defined in the OPPGS Act 2006 Vol 1 Chapter 1 Part 1.2 Div 1 Section 7 as:

structural integrity *includes the following:*

(a) structural soundness;
(b) structural strength;
(c) stability;
(d) fitness for purpose;
(e) mechanical integrity;
(f) systems integrity;

in connection with:

(g) the containment of:
(i) petroleum; or
(ii) a greenhouse gas substance; or
(iii) any other substance; or
(h) the health and safety of persons engaged in:
(i) offshore petroleum operations (within the meaning of Part 6.9); or
(ii) offshore greenhouse gas operations (within the meaning of Part 6.9).

For the purposes of paragraph (f), ***systems integrity*** *includes the integrity of the following:*

(i) electrical systems;
(j) electronic systems;
(k) hydraulic systems;
(l) chemical systems;
(m) dynamic positioning systems;
(n) other systems.

All Assets are Ageing

Scale of the Challenge

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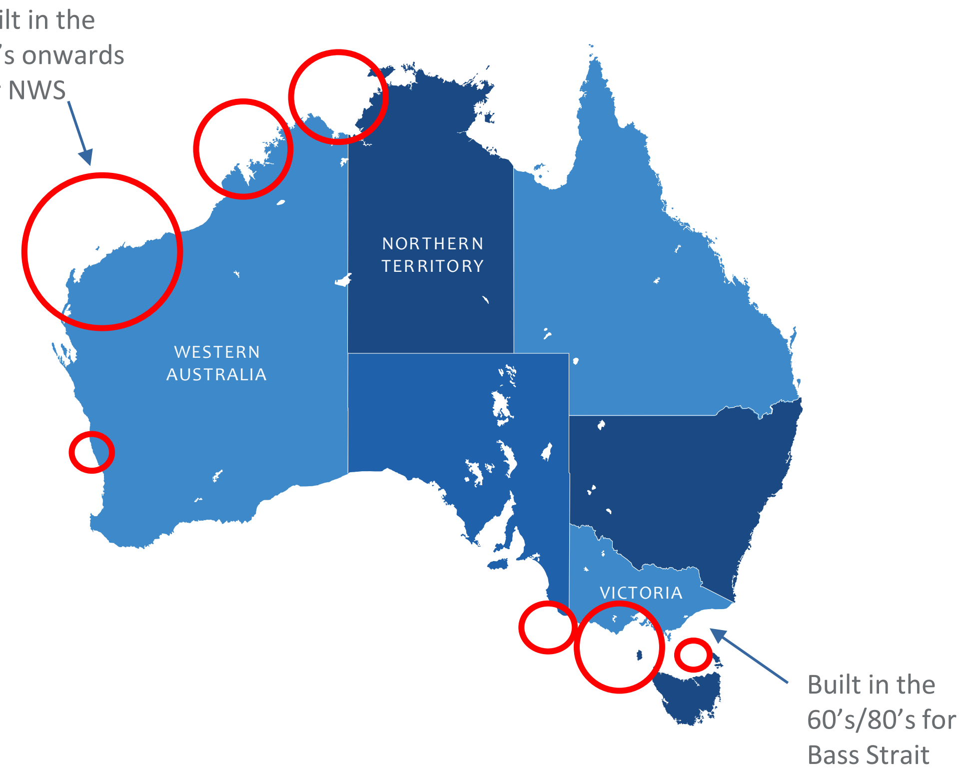

WA & NT

- 35 platforms
- 9 Floating facilities
- 6,076 km pipelines and static umbilicals
- 120 flexible risers and dynamic umbilicals
- ~548 wells to be plugged and abandoned

Victoria

- 22 platforms
- 2,089km pipelines and umbilicals
- 120 flexible risers and dynamic umbilicals
- ~460 wells to be plugged and abandoned

Typical offshore facility lifecycle

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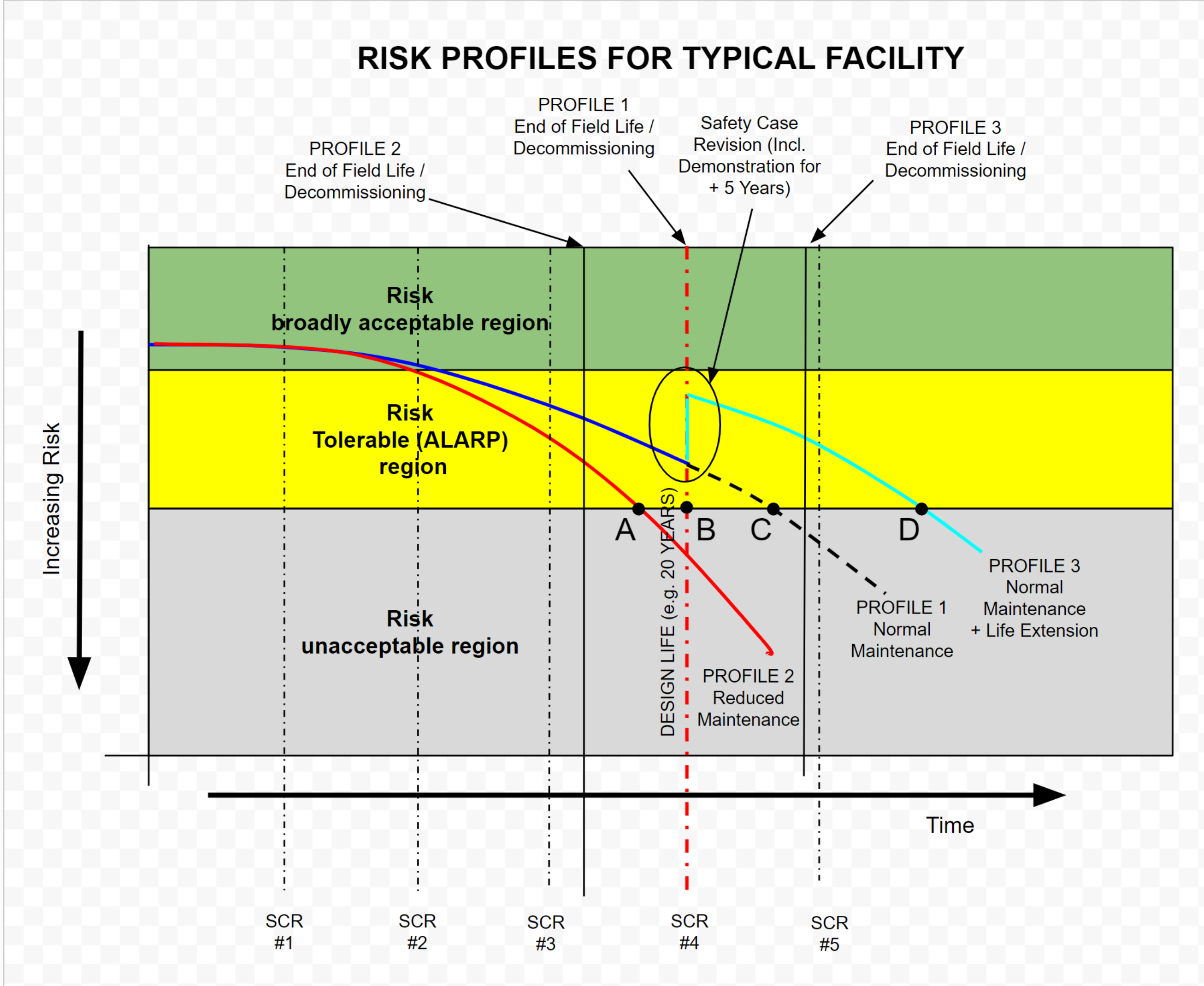

- **Profile 1 – Normal Maintenance**
  - Operator inspects, maintains and repairs the facility in line with standards, original equipment manufacturer recommendations and good oil field practice throughout the total service life.
- **Profile 2 – Reduced Maintenance**
  - If the oil field depletes faster than expected, or the economic conditions change, such that the operator does not intend to operate the facility for its entire design service life, the operator may be able to justify reducing inspection, maintenance and repair (IMR) for some safety critical equipment. Thereby accepting a reduction in service life.
- **Profile 3 – Normal Maintenance + Life Extension**
  - Operator implements a life extension programme to upgrade and repair structures and equipment to ensure continued safe operation for design life + life extension.

Australia's offshore Oil & Gas Landscape

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Milestones and legislative framework

1965
Bass Strait

1970s
North-West Shelf

1980-2020s
Carnarvon
Gippsland
Otway
Perth
Bonaparte
…

2017
Ichthys
Prelude

2020
NOGA Liquidation

PSL Act 1967

Sea Dumping Act 1981

EPBC Act 1999

OPGGS Act 2006

Amendments 2010 & 2011

Safety regs 2024
DNS?

IMO Member 1953

UNCLOS 1958

MARPOL 73/78

London Convention & Protocol 1972

IMO Resolution A672(16) 1989

Basel Convention 1992

Minamata Convention 2013

Legislative basis

Offshore Petroleum and Greenhouse Gas Storage Act 2006

No. 14, 2006

Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009

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- **Section 572**: Maintain all structures, equipment, and property in a title area in good condition and repair; remove these when no longer being used (or acceptable alternative).

- **Section 270:** Requires NOPSEMA to advise if it is satisfied titleholder decommissioning's obligations have been met prior to the surrender of the title.

- **2.12 Design, construction, installation, maintenance and modification**
    - (1) The safety case for a facility must describe the means by which the operator will ensure the adequacy of the design, construction, installation, maintenance or modification of the facility, for the relevant stage or stages in the life of the facility for which the safety case has been submitted.
    - (2) In particular, the design, construction, installation, maintenance and modification of the facility must provide for:

      (c) adequate means of maintaining the structural integrity of a facility

- **2.45 Work on a facility must comply with the safety case**

Regulating Structural Integrity

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Structural Integrity Significant Events




- 2006 — **North Rankin A** IN Flare Bridge
- 2011 — **Northern Endeavour** PN Corroded Deck
- 2018 — **Montara** Written Warning Cargo tanks
- 2019 — **Northern Endeavour** PN & GD General Corrosion
- 2022 — **Montara** PN & GD General Corrosion
- 2022 — **Wandoo** GD Pipelines
- 2022 — **ESSO Bass Strait** GD Structural Integrity
- 2023 — **North Rankin A** IN Flare Bridge




Regulatory guidance update

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- Ageing asset and life extension 13.07.2021
- Considerations when preparing for decommissioning activities15.12.2022
- Section 572 Maintenance and removal of property regulatory policy 09.12.2022
- Section 270 Consent to surrender title policy 02.09.2022
- Planning for proactive decommissioning 16.12.2021
- Decommissioning Compliance Plan 12.05.2021
- Decommissioning Compliance Strategy 12.05.2021

Key Industry Issues

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- Assumptions used for design, operation or maintenance can be incorrect or ineffective over time, leading to ineffective risk controls.
- Failure to implement an effective Structural Integrity Management (SIM) system can result in deficient or absent inspection data, which can hinder the evaluation and determination of appropriate maintenance programs.
- Performance standards may not take into account ageing effects, and deferral of maintenance programs can increase safety risks.
- Shortages of skilled and competent staff, coupled with the involvement of new, smaller duty holders lacking internal expertise, can hinder the effective management of structural integrity.

Learnings

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- Several offshore facilities are aging and being operated beyond their original planned design life.
- Improvement Notices and General Directions have been necessary to address Structural Integrity related issues.
- Structural integrity of offshore facilities requires management throughout the planned operating life of the facility.
- An effective Structural Integrity Management system is important for enabling inspection, monitoring, and repair to benchmarked standards.
- End-of-life O&G assets have the potential to be reused for CCS.

A number of key processes that constitute good practice

- *Policy: The policy sets out the overall intention and direction of the duty holder with respect to structural integrity and the framework for control of integrity related processes and activities. These should be aligned with the operator's strategic plan and other corporate policies.*
- *Strategy: The strategy sets out the operator's process for delivering the integrity management of its assets in line with the Structural Integrity Policy and specifies acceptance criteria.*
- *Organisation and management: An appropriate organisational structure with defined management processes defining the roles and responsibilities of individuals.*
- *Inspection Strategy: A systematic approach to the development of a plan for the in-service inspection of a structure. Inspection strategies are used to populate some of the fields in an Inspection (such as Inspection Extent, Inspection Task Type)*
- *Inspection Programme: The operator's inspection programme provides the detailed scope of work for the offshore execution of the inspection activities to determine the current condition of the structure. It is developed from the inspection strategy.*
- *Evaluation: Review of the current condition compared to that when it was last assessed and other parameters that affect the integrity and risk levels to confirm or otherwise that the acceptance criteria for structural integrity are met. This process identifies any repair or maintenance requirements to meet the acceptance criteria for structural integrity.*
- *Maintenance: The upkeep of the required condition of the structure by proactive intervention based on output from the structural evaluation.*
- *Information Management: The process by which all relevant historical and operational documents, data and information are collected, communicated, and stored.*
- *Audit and Review: Audit is the process to confirm that SIM is carried out in conformity with the procedures set out in the SIM policy and strategy and legislation. The review process assesses how the SIM processes can be improved on the basis of in-house and external experience and best industry practice.*
- *Life Extension Evaluation: Evaluation of structural integrity for operations beyond the design life of the installation.*

NOPSEMA – Initiatives underway

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Initiative 1 – Update Safety Case Guidance Notes for Operators

Initiative 2 – Develop and Publish NOPSEMA Positions and Guidance on Structural Integrity

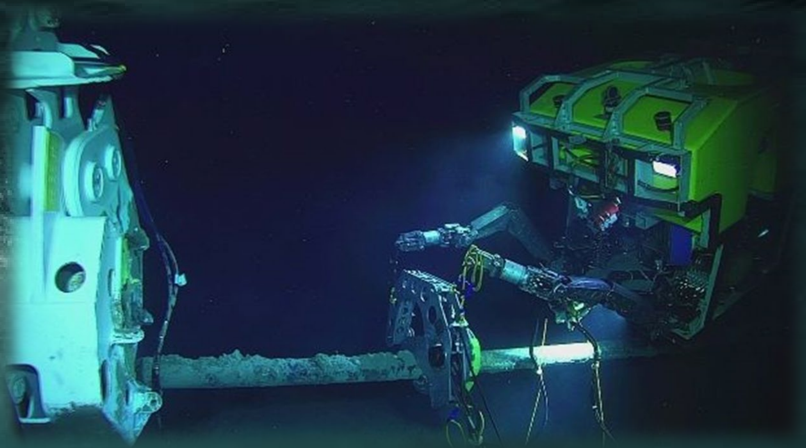
Initiative 3 - Update Safety Case Assessment Guidance

Initiative 4 - Update Inspection Guidance

Initiative 5 - Prepare Risk-Based Inspection Plans

Initiative 6 - Create Subject Matter Expert (SME) Groups

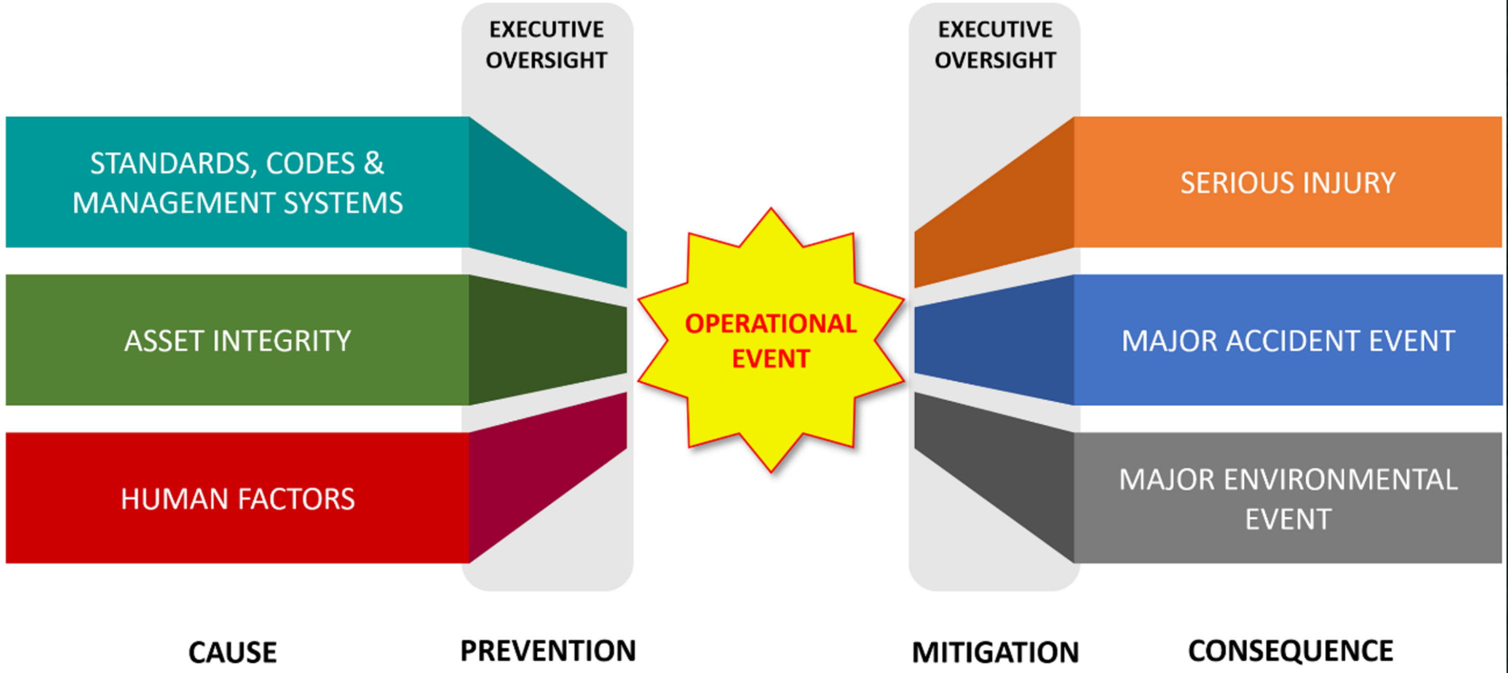
Initiative 7 – Strengthen and Define Criteria For Enforcement Action



NOPSEMA – Initiatives underway

STRUCTURAL INTEGRITY INITIATIVES

Initiative 1: Update Safety Case Guidance Notes	Initiative 2: Publish NOPSEMA Positions and Guidance on Structural Integrity	Initiative 3: Develop Safety Case Assessment Guidance
Initiative 4: Develop Inspection Guidance	Initiative 5: Prepare Risk-Based Inspection Plans	Initiative 6: Create Subject Matter Experts (SME) Groups
Initiative 1: Update Safety Case Guidance Notes	Initiative 2: Publish NOPSEMA Positions and Guidance on Structural Integrity	Initiative 7: Enforcement Action



Well Integrity Risk Associated with the Management of Change

Mark Bourne, Well Integrity Specialist

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NOPSEMA focus - Controlling the risk

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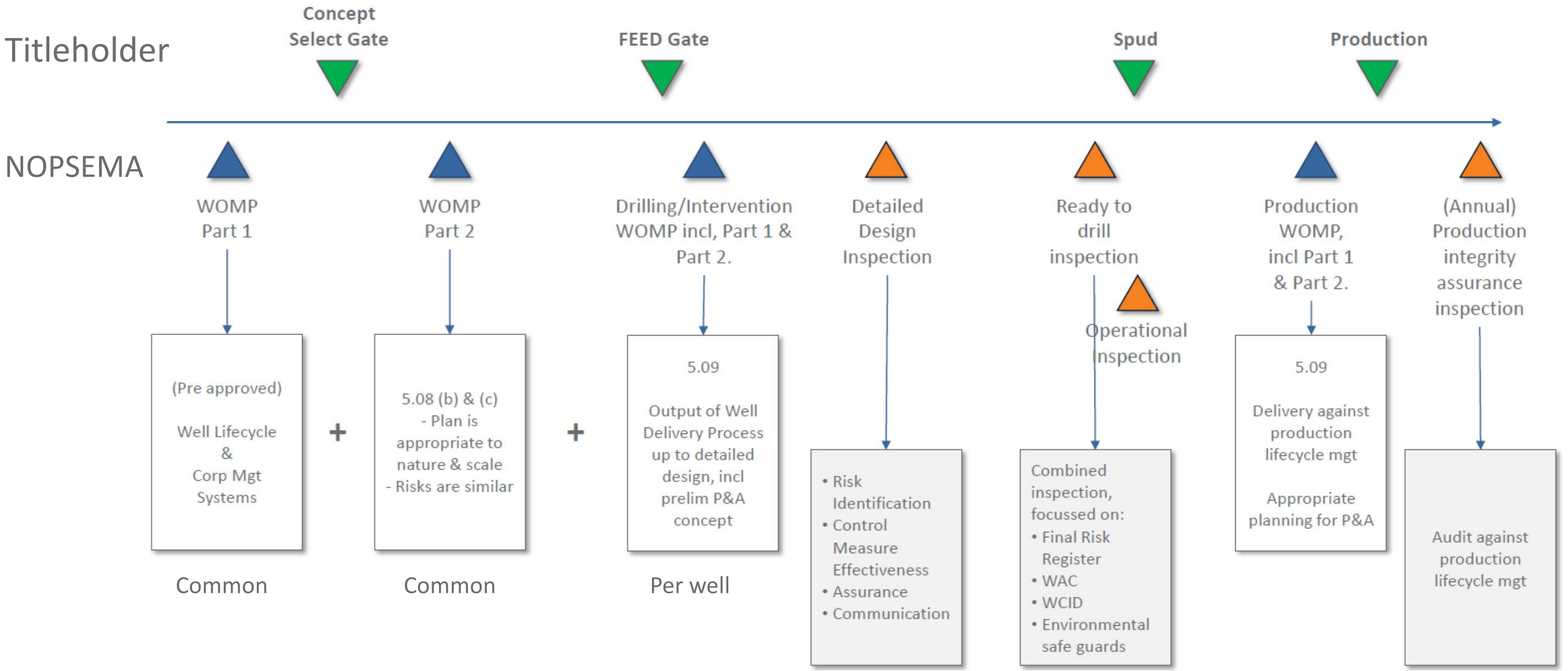
5.09 Contents of well operations management plan

Risk Identification	(b) a description of the risk management process used to identify and assess risks to the integrity of the well;
Control measure effectiveness	(e) a description of the control measures that will be in place to ensure that risks to the integrity of the well will be reduced to as low as reasonably practicable
Assurance	(h) a description of the monitoring, audit and well integrity assurance processes that will be implemented to ensure the performance outcomes and performance standards are being met
Communication	(j) a description of the measures that will be used to ensure that contractors and service providers undertaking well activities are aware of their responsibilities in relation to the maintenance of the integrity of the well,

Whole of life cycle approach to risk management



Design Phase

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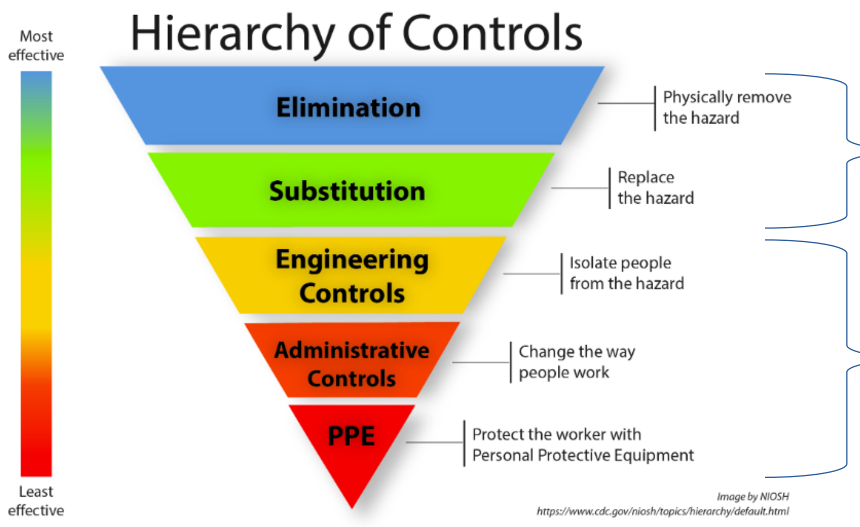
(c) a description and explanation of the design, construction, operation and management of the well, and conduct of well activities, showing how risks to the integrity of the well will be reduced to as low as reasonably practicable;

Risk identification starts here
Risk register created
Optimum phase for elimination



Identified in risk register
This can be improved

WOMPs risk being focussed here

Common pitfalls:

- Concept select based on tolerable risk rather than risk ALARP
- Inappropriate equipment selection,e.g. Xmas tree design, mudline tiebacks, multizone smart wells
- Inappropriate vessel selection. e.g LWIV vs MODU
- Abandonment not fully considered.
- ALARP by design, not ALARP for the design

Construction/ Intervention phase

(a) a description of the well, and the well activities relating to the well, to which the plan applies;

Well construction/ Intervention phase:

- MOCs are typically associated with a failure to achieve a desired performance standard.
- MOC against standards (prior to operations) = change to the performance standard.
- Interface with rig MOC system – are all relevant parties' part of the process?
- Sub optimum rig choice due to availability
- “Aspirational” standards, if not achieved MOC to lower “standard”(abandonment plug length, trip margins, annular cement height and quality)
- Sidetracks (implications for abandonment)
- Geological MOCs, drift from design envelope

Production phase

(h) a description of the monitoring, audit and well integrity assurance processes that will be implemented to ensure the performance outcomes and performance standards are being met

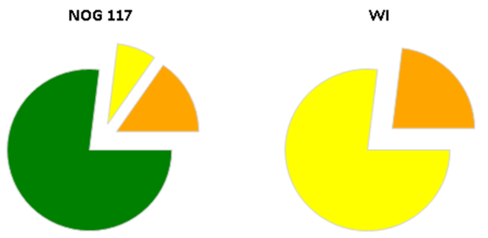
Multiple incremental MOCs, individual risk assessments. Complacency of change. Performance drift. Management oversight.

Barrier Status Report

Selected titleholder/s: Titleholder X

Titleholder (NOG 117) Tier	NOPSEMA Well Integrity Tier
Healthy well - no or minor issue	No MOC or other issue
One barrier degraded, the other is intact	1 or more MOC or other issue
One barrier failure and the other is intact, or a single failure may leak to surface	One barrier failure and the other is intact, or a single failure may
One barrier failure and the other is degraded/not verified or leak to surface	One barrier failure and the other is degraded/not verified or leak to

Selected well status/es: Non-operational - shut in, Non-operational - suspended, Operational
Selected borehole reason/s: All
Selected well type/s: All
WOMP in force[1]?: All
Number of associated incident/s: All
Well integrity tier/s: All
Currently reporting?: All
Selected FPI/s: All
Selected *latest* WOMP/s:
Total wells (based on above filters): 13



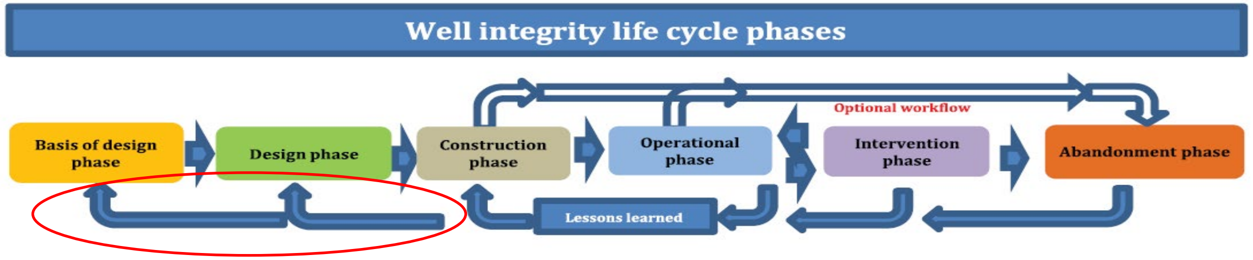
Titleholder	Well status	Well	Well type	Spud date	Barrier diagram	Status update date	Status notes	Borehole reason	NOG 117 tier	WI tier	Total WANs	Total incidents	Last accepted WOMP
Facility 2	Operational	Oil producer 1	Oil producer - gas lift	18/09/1994	A897628	27/03/2020	MOC on SCSSSV	Development - subsea			0	2	6797
		Oil producer 2	Oil producer - gas lift	04/02/1997	A906060	27/03/2020	MOC on gauges, MOC on AMV and AWV	Development - subsea			0	-	6797
		Oil producer 3	Oil producer - gas lift	03/07/1994	A906062	27/03/2020	MOC on gauges, MOC on AMV and AWV	Development - subsea			0	1	6797
		Oil producer 4	Oil producer - gas lift	30/01/2006	A897637	27/03/2020	MOC on SCSSSV	Development - subsea			0	1	6797
	Non-operational - suspended	Oil producer 5	Oil producer - gas lift	24/10/2009	A897635	01/11/2019	MOC on tubing leak, MOC on PWV	Development - subsea			1	2	6797
		Oil producer 6	Oil producer - gas lift	01/02/1990	A897624	01/03/2006	MOC for suspension	Development - subsea			0	1	6797
		Oil producer 7	Oil producer - gas lift	28/05/1990	A897632	01/11/2019	MOC on gauges, MOC on SCSSSV, PMV, PWV, AMV	Appraisal			1	1	6797
	Non-operational - shut in	Oil producer 8	Oil producer - gas lift	21/07/1998	A897639	08/03/2022	MOC on gauges, MOC on AMV & AWV, MOC on SCSSSV MOC on SVN	Development - subsea			0	1	6797
		Oil producer 9	Oil producer - gas lift	10/10/2004	A897627	08/03/2022	No production for > 1 year	Development - subsea			0	-	6797
		Oil producer 10	Oil producer - gas lift	05/07/2006	A897630	08/03/2023	No production for > 1 year	Development - subsea			0	-	6797
		Oil producer 11	Oil producer - gas lift	08/11/1988	A897631	27/02/2020	MOC on PMV, MOC on SCSSSV PMV & AMV	Development - subsea			0	-	6797
		Oil producer 12	Oil producer - gas lift	10/11/1994	A897625	14/01/2023	MOC on PMV & AWV	Development - subsea			0	2	6797
		Oil producer 13	Oil producer - gas lift	23/08/2004	A906061	08/03/2022	MOC on gauges, MOC on AMV and AWV	Development - subsea			0	-	6797

Abandonment Phase

(i) a description of the arrangements that will be in place for suspension and abandonment of the well, showing:

(i) how, during the process of suspending or abandoning the well, risks to the integrity of the well will be reduced to as low as reasonably practicable; and

(ii) how the actions taken during that process will ensure that the integrity of the well is maintained while the well is suspended or abandoned;



- Sub optimum original design – build in the abandonment at the design phase
- Abandonment not taken into account in construction MOCs.
- Insufficient pre-planning, operating by MOC
- Lack of contingency (over optimistic)
- Barrier acceptance and verification

What good looks like

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- Planned contingency
- Planned robustness of barriers
- Consideration of abandonment during operations
- Verification – MOC – competency of people, correct people
- Good planning and execution with robust MOC process is good economics
- Barrier acceptance criteria reviewed and accepted by competent person

Unveiling Neglected Risks: Enhancing Operational Safety Risk Assessment and Mitigation

Warrick Hyde, acting Lead OHS Regulatory Specialist, Assessment & Inspection, Floating Production & Drilling team

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Introduction

Enhancing Operational Risk Assessments for Control of Work (CoW) Activities

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- Welcome to the presentation on "Enhancing CoW Risk Assessments."
- Focuses on the critical role of risk assessments in modern operating environments.
- Addresses common pitfalls and explores solutions for improvement.
- Objective: Enhance CoW risk assessments for safer workplaces.
- These are points of discussion – not NOPSEMA policy.

Common Pitfalls

Pitfalls in CoW Assessments

- **Neglect of Major Accident Events:** CoW assessments may neglect to adequately address major accident events.
- **Underestimating Unique Activity Risks:** In some cases, risk assessments tend to concentrate on routine risks while overlooking or inadequately addressing the specific hazards associated with unique or unusual activities.
- **Risk Flooding:** Risk assessments may suffer from 'Risk Flooding,' a phenomenon where numerous routine risks are listed extensively.
- **Overemphasis on Routine Risks:** CoW risk assessments often place too much focus on routine or everyday risks which can divert attention from the less common – less well understood – unique risks.

Risk Flooding

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- **Definition:** Risk flooding refers to the overwhelming presence of numerous routine or low-level risks in risk assessments, diminishing the attention given to critical or high-impact risks.
- **Overemphasis on Routine Risks:** Risk assessments may excessively list standard or routine risks, often overlooking more significant or novel hazards.
- **Loss of Focus:** When risk assessments are flooded with routine risks, the focus shifts away from identifying and mitigating genuinely high-consequence risks.
- **Desensitisation:** Similar to alarm flooding, risk flooding can lead to desensitisation, where individuals become less responsive or vigilant to the risks presented.

Desensitisation

Causes and consequences

- **Repetitive Exposure:** Overexposure to routine risks in risk assessments can lead to desensitisation.
- **Diminished Perceived Severity:** Frequent encounters with the same risks can cause individuals to perceive them as less severe or less likely to occur.
- **Reduced Vigilance:** Desensitisation may result in reduced vigilance and attentiveness to familiar risks, leading to decreased compliance with safety measures.
- **Inattention to Novel Risks:** Desensitised individuals may pay less attention to or underestimate the importance of novel or unique risks in assessments.
- **Risk Prioritisation:** Desensitisation can lead to routine risks taking precedence in assessments, potentially overshadowing more critical but less frequently encountered risks.

Overemphasis on Routine Risks

Features of ‘Routine Risks’

- **Frequent Occurrence:** Routine risks are hazards or dangers that occur regularly in everyday activities or operations.
- **Predictable**: They are well-known, expected, and often documented in standard operating procedures and safety guidelines.
- **Common Examples:** Routine risks include slips, trips, falls, repetitive strain injuries, and minor incidents.
- **Standard Control Measures:** Typically, there are established and standardised control measures to mitigate routine risks (PPE, drop sheets, lifting plans).
- **Continuous Vigilance:** While routine risks are common, continuous vigilance is necessary to prevent accidents or incidents.

Examples of Routine Risks

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Example 1: Noise

- Hazard: Noise
- Control Measure: "Use hearing protection that fits and reduces exposure below 85 dB(A) for an eight-hour work period."
- Issue: The control measure is routine and generic, lacking specificity for the actual work context.

Example 2: Human Factors

- Hazard: Human Factors (e.g., supervision, ergonomics, capability, fit for work)
- Control Measures:
  - "Be aware of PPE impairing mobility/vision."
  - "Be aware of pinch points, trapping fingers, hands, or feet."
- Issue: These control measures are standard and lack task-specific guidance.

Examples of Routine Risks

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Example 3: Unclear Procedures or Documentation

- **Hazard:** Unclear Procedures or Documentation
- **Control Measure:**
  - "If a procedure or document is unclear, STOP the job until clarification can be sought."
  - "Only approved procedures are to be used with this permit."
- **Issue:** While important, these measures are generic and don't address unique risks.

Summary of Ineffectiveness:

- In these examples, hazards are generic and control measures are standard.
- Risk assessments should provide tailored, task-specific guidance to be effective.

Examples of Routine Risk made Specific

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Example 4: Toxic Gas Exposure

- **Hazard:** There is a risk of exposure to toxic levels of benzene vapours (>2.5 ppm) when breaking containment. This risk arises from the presence of benzene in the unstabilised condensate stored in Tank T-101.
- **Control Measure:**
  - The isolation control certificate mandates reducing the benzene concentration within the isolation envelope to below 0.25 ppm (the TLV for an 8-hour work shift is 0.5 ppm). To achieve this, the tank will undergo a sequence of steps, including draining, venting, flushing, and purging, until the benzene concentration reaches the desired level. This measurement will be conducted using a certified and calibrated device.
  - A continuous benzene monitor will be strategically placed at a suitable location, which should be less than 2 meters away from the point of containment breach. Its purpose is to consistently verify that background benzene levels remain below 0.5 ppm. In the event that benzene levels exceed 0.5 ppm for more than 5 minutes, all work activities must immediately cease, and the permit will be suspended.
- **Benefit:** The risk assessment is specific and actionable.

Not Enough Focus on Unique Risks

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Features of 'Unique Risks'

- **Infrequent Occurrence:** Unique risks are hazards or dangers that are rare, uncommon, or specific to particular circumstances or tasks.
- **Less Predictable:** They are often less predictable and may not have been encountered frequently in the past.
- **Varied Examples:** Unique risks can vary widely and may include equipment malfunctions, complex system failures, or unprecedented situations.
- **Tailored Control Measures:** Control measures for unique risks need to be specifically designed to address the particular hazard.
- **Heightened Awareness:** Unique risks require heightened awareness and adaptability because they may be less familiar and may require innovative solutions.

Example of Unique Risks

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Example 1: Loss of HC Containment – Relief Valve Replacement

- **Hazard:** There is no isolation valve upstream of PSV-XYZ and Vessel T-101 cannot be fully isolated and hydrocarbon freed while the facility is in operation – There is a risk of loss of HC containment when breaking containment, with the potential for ignition leading to and MAE
- **Control Measure:** There is currently no identified safe method for replacing the PSV while the facility is in operation. This risk is categorised as high, considering both the potential consequences (multiple fatalities) and the likelihood (previous occurrences in the industry).
- In comparison, the risk associated with delaying the recertification of the PSV for 12 months is considered lower than attempting the removal without proper vessel preparation. Therefore, the task will be postponed until the next scheduled facility shutdown, which is set to occur in 12 months.
- **Benefit:** MAE risks identified. Risk assessment is specific to the task.

Impact of Ineffective Risk Assessments

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Routine Risks and Reduced Engagement:

- Routine risk assessments tend to emphasise well-understood hazards.
- This can result in reduced engagement among individuals familiar with these risks.

Lack of Vigilance:

- Familiarity with routine assessments may lead to reduced vigilance.
- People may become less proactive in adhering to safety measures for well-known risks.

Potential for Overshadowing:

- Routine assessments can overshadow critical but less frequently encountered risks.
- Novel or unique hazards may be given lower priority or even overlooked.

Impact of Ineffective Risk Assessments

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Safety Culture Implications:

- Disengagement caused by routine-heavy assessments can impact the overall safety culture.
- A diminished safety culture may result in complacency and reduced safety consciousness.

Balancing Act:

- Striking a balance between addressing routine risks and maintaining awareness of unique risks is essential.
- Routine assessments should not compromise the ability to recognise and mitigate less common, high-impact hazards.

Improving Risk Assessments

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- **Move from Paperwork to Meaningful Assessments:**
  - Risk assessments can sometimes deteriorate into mere paperwork exercises, diminishing their value in uncovering critical risks.
- **Recognising the Importance of Proactive Risk Identification:**
  - Emphasise the significance of using assessments as tools for proactively identifying risks.
  - Encourage a shift in mindset from assessments driven solely by compliance to those focused on revealing potential risks.
- **Engaging the Workforce:**
  - Involve employees in the risk assessment process to shift focus effectively.
  - Employees play a critical role in identifying new and emerging risks.
- **Empowering Problem Solvers:**
  - Highlight the importance of cultivating a culture that empowers individuals to proactively solve problems rather than passively follow rules.

Addressing the Issue

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Separating Routine and Task-Specific Risks:

- Consider separating standard and routine risks from task-specific risk assessments.
- This separation can provide clarity and streamline assessments.

Tailored Control Measures:

- Encourage the development of task-specific control measures.
- These measures should directly address the unique risks associated with specific tasks.

Addressing the Issue

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Enhanced Training and Awareness:

- Promote enhanced training to raise awareness of the importance of identifying both routine and novel risks.
- Encourage workforce involvement in risk identification beyond a paperwork exercise.

Overall Improvement Objective:

- The objective is to create more effective CoW risk assessments that are adaptable, clear, and prioritise all relevant risks.

Conclusion

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Enhancing CoW Risk Assessments is Vital:

- Prioritising effective risk assessments is critical for safety and success.

Safety and Efficiency Go Hand in Hand:

- Improved assessments not only enhance safety but also boost operational efficiency.

A Continuous Journey:

- Recognise that refining risk assessment practices is an ongoing journey.

Your Active Role:

- You play a crucial role in creating safer work environments through proactive risk identification.

Thank You for Your Engagement:

- We appreciate your attention and participation in this discussion.

Panel session and audience Q&A with NOPSEMA's Environment Leadership

Cameron Grebe, head of Environment, Renewables and Decommissioning Division

Nicola Brischetto, acting Production Coordinator,

Raquel Carter, Chief Environmental Scientist

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